YU25
AMERICA
2025 / 2026

ISO 9001 / ISO 14001

CUTTING TOOLS

MILLING

YG-1 CO., LTD.

MILLING TOOLS

CBN END MILLS
i-Xmill, CARBIDE INSERT END MILLS
i-Smart MODULAR TYPE END MILLS
i-SMART END MILLS
X1-EH SOLID CARBIDE END MILLS
X5070 SOLID CARBIDE END MILLS
4G Mill SOLID CARBIDE END MILLS
X-POWER PRO SOLID CARBIDE END MILLS
TitaNox-POWER & HPC SOLID CARBIDE END MILLS
JET-POWER SOLID CARBIDE & HSS-PM END MILLS
V7 PLUS A SOLID CARBIDE END MILLS
V7 MILL INOX SOLID CARBIDE END MILLS
ALU-POWER HPC SOLID CARBIDE END MILLS
ALU-POWER SOLID CARBIDE & HSS-PM END MILLS
D-POWER GRAPHITE SOLID CARBIDE END MILLS
STANDARD CARBIDE END MILLS
ONLY ONE COATED PM60 END MILLS
SINE-POWER HSS END MILLS
TANK-POWER HSS-PM END MILLS
COBALT & HSS END MILLS
TECHNICAL DATA

YG-1 CO., LTD.

Contents
MILLING TOOLS

CBN END MILLS

CARBIDE EXCHANGEABLE END MILLS

SOLID CARBIDE END MILLS

CARBIDE & HSS END MILLS

SOLID CARBIDE END MILLS

HSS END MILLS

TECHNICAL DATA

CBN END MILLS
CBN(Cubic Boron Nitride) Machining High Hardened Steels up to HRc70 / Mirror Finish

i-Xmill, CARBIDE INSERT END MILLS
Various Applications Type of Inserts Available for General Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steels and Graphite

i-SMART MODULAR TYPE END MILLS
For General Steels, Hardened Steels and Cast Iron

X1-EH SOLID CARBIDE END MILLS
Highly Accurate Fine-Finishing for High Hardened Steel

X5070 SOLID CARBIDE END MILLS
For High Hardened Steels (HRc45 to HRc70)

4G Mill SOLID CARBIDE END MILLS
High Speed Cutting for Pre-Hardened Steels up to HRc55

X-POWER PRO SOLID CARBIDE END MILLS
For Pre-Hardened Steels up to HRc55

TitaNox-POWER & HPC SOLID CARBIDE END MILLS
High Speed Machining for Exotic Materials: Titaniuml and Stainless Steels

JET-POWER SOLID CARBIDE & HSS-PM END MILLS
For Exotic materials like Stainless Steels, Nickel Alloys and Titanium

V7 PLUS A SOLID CARBIDE END MILLS
High Performance Carbide End Mills for Steels, Cast Iron and Stainless Steels

V7 MILL INOX SOLID CARBIDE END MILLS
Silent Cutting of Stainless Steels up to HRc40 / Designed as Variable Leads, YG-1's Patent

ALU-POWER HPC SOLID CARBIDE END MILLS
For Aluminium, Aluminum Die Cast, Non-ferrous Alloys and Plastics

ALU-POWER SOLID CARBIDE & HSS-PM END MILLS
For Aluminium Alloys and Silent Cutting

D-POWER GRAPHITE SOLID CARBIDE END MILLS
For Graphites

STANDARD SOLID CARBIDE END MILLS
General Purpose

ONLY ONE COATED PM60 END MILLS
Perfect Solution of Carbide Chipping under Vibrations

SINE-POWER HSS END MILLS
High Performane HSS Rongher for Titanium and Titanium Alloys

TANK-POWER HSS-PM END MILLS
High Toughness for Stainless Steels, Carbon steels and Alloy Steels / for General Application, Roughing & Finishing

COBALT & HSS END MILLS
General Purpose / Coating Available

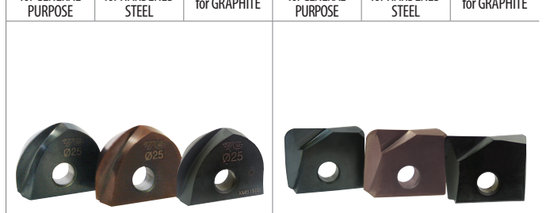
TECHNICAL DATA

YG-1 CO., LTD.

SELECTION GUIDE

MILLING TOOLS

	CBN		i-Xmill INSERTS (Inch)					
SERIES	ESB94	ESD02	XB1A	XB2C	XB1D	XR1A	XR2A	XR1D
FLUTE	2	2	2	2	2	2	2	2
HELIX ANGLE	30°	0°	-	-	-	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R0.2	D0.5	R5/32	R5/32	R5/32	D5/16	D5/16	D5/16
SIZE MAX	R1.5	D2.0	R5/8	R5/8	R5/8	D1-1/4	D1-1/4	D1-1/4
PAGE	C47	C48	C54			C57		
LENGTH	-	-	-	-	-	-	-	-
SURFACE TREATMENT	Uncoated	Uncoated	AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond
			for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE

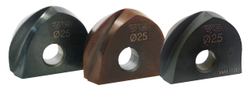


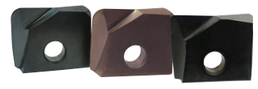
Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125				◎			◎		
	2		190	13			◎			◎		
	3		250	25			◎			◎		
	4		270	28			◎			◎		
	5		300	32			◎			◎		
	6	Low alloy steel	180	10			◎			◎		
	7		275	29			◎			◎		
	8		300	32			◎			◎		
	9		350	38				◎			◎	
	10	High alloyed steel, and tool steel	200	15				○			○	
	11		325	35				○			○	
M	12	Stainless steel	200	15						◎		
	13		240	23						◎		
	14		180	10						◎		
K	15	Grey cast iron	180	10				◎			◎	
	16		260	26				◎			◎	
	17	Nodular cast iron	160	3				◎			◎	
	18		250	25				◎			◎	
	19	Malleable cast iron	130					◎			◎	
	20		230	21				◎			◎	
N	21	Aluminum-wrought alloy	60						○			○
	22		100						○			○
	23	Aluminum-cast, alloyed	75						○			○
	24		90						○			○
	25		130									
	26	Copper and Copper Alloys (Bronze / Brass)	110									
	27		90									
	28		100									
	29	Non Metallic Materials							◎			◎
	30											
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm									
	37		1050 Rm									
H	38	Hardened steel	550	55	◎	◎		○			○	
	39		630	60	◎	◎						
	40	Chilled Cast Iron	400	42								
	41	Hardened Cast Iron	550	55	◎	◎						

	i-Xmill INSERTS (Metric)						i-Xmill HOLDERS		
	XB1N	XB2N	XBAD	XRAA	XRBA	XRAD	ZBT ZBS	ZBC	ZRT ZRS
FLUTE	2	2	2	2	2	2	-	-	-
HELIX ANGLE	-	-	-	-	-	-	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	R4.0	R4.0	R4.0	D8.0	D8.0	D8.0	-	-	-
SIZE MAX	R16.0	R16.0	R16.0	D32.0	D32.0	D32.0	-	-	-
PAGE	C59			C62			in C55 / mm C60	in C56 / mm C61	in C58 / mm C64
LENGTH	FULL RADIUS	-	-	-	-	HIGH FEED	STRAIGHT & TAPER NECK	STRAIGHT NECK	STRAIGHT & TAPER NECK
SURFACE TREATMENT	AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond	Steel	Carbide	Steel
	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE			





P	1	◎			◎								1
	2	◎			◎								2
	3	◎			◎								3
	4	◎			◎								4
	5	◎			◎								5
	6	◎			◎								6
	7	◎			◎								7
	8	◎			◎								8
	9		◎			◎							9
	10		○			○							10
	11		○			○							11
M	12				◎								12
	13				◎								13
	14				◎								14
K	15		◎			◎							15
	16		◎			◎							16
	17		◎			◎							17
	18		◎			◎							18
	19		◎			◎							19
	20		◎			◎							20
N	21			○			○						21
	22			○			○						22
	23			○			○						23
	24			○			○						24
	25												25
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	27												27
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	29			◎			◎						29
	30												30
S	31												31
	32												32
	33												33
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	36												36
	37												37
H	38		○			○							38
	39												39
	40												40
	41												41

SELECTION GUIDE

YG

MILLING TOOLS

	i-SMART MODULAR HEAD				
SERIES	XGMF15	XGMF17	XGMF20	XGMF25	XGMF29
FLUTE	2	4	4	4	6
HELIX ANGLE	30°	30°	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	45°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE	SQUARE
SIZE MIN	R3/16	R3/16	D3/8	D3/8	D3/8
SIZE MAX	R5/8	R5/8	D1-1/4	D1-1/4	D1-1/4
PAGE	C72	C73	C74	C75	C76
LENGTH	-	-	-	-	-
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

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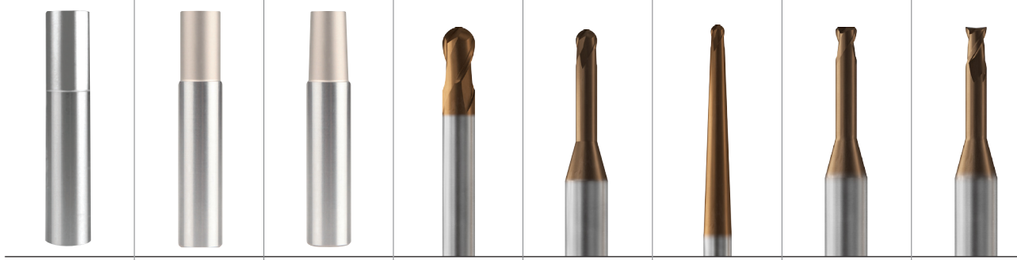
ISO	VDI 3323	Material Description	HB	HRc					
P	1	Non-alloy steel	125		○	○	○	○	○
	2		190	13	○	○	○	○	○
	3		250	25	○	○	○	○	○
	4		270	28	○	○	○	○	○
	5		300	32	○	○	○	○	○
	6	Low alloy steel	180	10	○	○	○	○	○
	7		275	29	○	○	○	○	○
	8		300	32	○	○	○	○	○
	9		350	38	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15					
	13		240	23					
	14		180	10				○	
K	15	Grey cast iron	180	10	○	○	○	○	○
	16		260	26	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○
	18		250	25	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○
	20		230	21	○	○	○	○	○
N	21	Aluminum-wrought alloy	60						
	22		100						
	23	Aluminum-cast, alloyed	75						
	24		90						
	25		130						
	26	Copper and Copper Alloys (Bronze / Brass)	110						
	27		90						
	28		100						
	29	Non Metallic Materials							
	30								
S	31	Heat Resistant Super Alloys	200	15					
	32		280	30					
	33		250	25					
	34		350	38					
	35		320	34					
	36	Titanium Alloys	400 Rm						
	37		1050 Rm						
H	38	Hardened steel	550	55	○	○	○	○	○
	39		630	60					
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○

	i-SMART MODULAR HEAD			X1-EH				
	ZMC	ZMS	ZMT	HPI90	HPI91	HPI92	HPI89	HPI88
	-	-	-	2	2	2	2	2
	-	-	-	30°	30°	30°	35°	35°
	-	-	-	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE
	-	-	-	R0.05	R0.05	R0.05	D0.2	D0.1
	-	-	-	R10.0	R3.0	R6.0	D3.0	D6.0
	C77	C78	C79	C88	C89	C99	C109	C116
	STRAIGHT NECK	STRAIGHT NECK	TAPER NECK	-	RIB PROCESSING	TAPER NECK	RIB PROCESSING	RIB PROCESSING
	Carbide	Steel	Steel	C-Coating	C-Coating	C-Coating	C-Coating	C-Coating



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5				○	○	○	○	○	
6									P
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8				○	○	○	○	○	
9				○	○	○	○	○	
10									
11				○	○	○	○	○	
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39				◎	◎	◎	◎	◎	H
40				○	○	○	○	○	
41				◎	◎	◎	◎	◎	

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

MILLING TOOLS

	X5070 (Inch)				X5070 (Metric)	
SERIES	G826	G8A43	G850	G851	G859	G854
FLUTE	4	2	4	6&8	4	4
HELIX ANGLE	0°	30°	30°	45°	0°	0°
CUTTING EDGE SHAPE	CORNER RADIUS	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	D1/8	R1/64	D1/16	D1/4	D2.0	D2.0
SIZE MAX	D1/2	R1/4	D3/4	D1	D16.0	D16.0
PAGE	C148	C149	C150	C151	C152	C153
LENGTH	HIGH FEED	EXTENDED NECK	EXTENDED NECK	-	HIGH FEED	HIGH FEED LONG SHANK
SURFACE TREATMENT	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating

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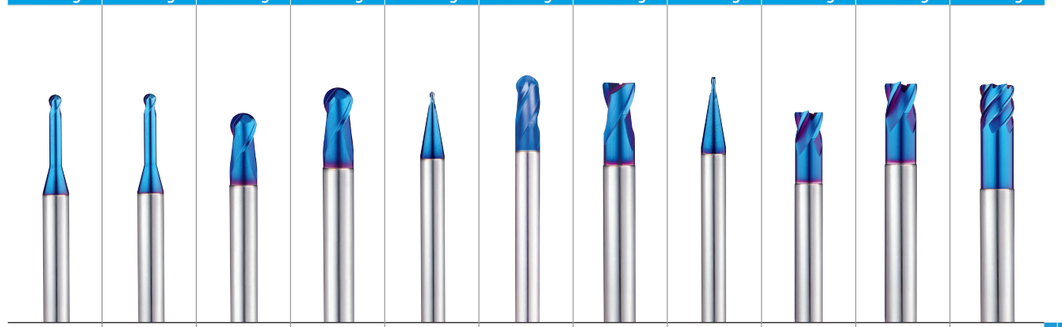
ISO	VDI 3323	Material Description	HB	HRc											
P	1	Non-alloy steel	125												1 P
	2		190	13											2
	3		250	25											3
	4		270	28											4
	5		300	32	○	○	○	○	○	○	○	○	○	○	○	○	5
	6	Low alloy steel	180	10											6
	7		275	29											7
	8		300	32	○	○	○	○	○	○	○	○	○	○	○	○	8
	9		350	38	○	○	○	○	○	○	○	○	○	○	○	○	9
	10	High alloyed steel, and tool steel	200	15											10
	11		325	35	○	○	○	○	○	○	○	○	○	○	○	○	11
M	12	Stainless steel	200	15											12
	13		240	23											13 M
	14		180	10											14
K	15	Grey cast iron	180	10											15
	16		260	26											16
	17	Nodular cast iron	160	3											17
	18		250	25											18 K
	19	Malleable cast iron	130												19
	20		230	21											20
N	21	Aluminum-wrought alloy	60												21
	22		100												22
	23	Aluminum-cast, alloyed	75												23
	24		90												24
	25		130												25
	26	Copper and Copper Alloys (Bronze / Brass)	110												26 N
	27		90												27
	28		100												28
	29	Non Metallic Materials													29
	30														30
S	31	Heat Resistant Super Alloys	200	15											31
	32		280	30											32
	33		250	25											33
	34		350	38											34 S
	35		320	34											35
	36	Titanium Alloys	400 Rm												36
	37		1050 Rm												37
H	38	Hardened steel	550	55	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	38
	39		630	60	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	39 H
	40	Chilled Cast Iron	400	42	○	○	◎	◎	○	○	○	○	○	○	○	○	40
	41	Hardened Cast Iron	550	55	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	41

	X5070 (Metric)										
	G8A46	G8A54	G8A28	G8A38	G8A53	G8A59	G8A36	G8A50	G8A47	G8A37	G8A39
FLUTE	2	2	2	2	2	3	2	2	4	4	6
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	45°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R0.05	R0.25	R0.05	R0.5	R0.2	R1.5	D0.3	D0.3	D3.0	D1.0	D6.0
SIZE MAX	R2.0	R1.0	R6.0	R12.5	R1.0	R10.0	D20.0	D2.0	D12.0	D20.0	D20.0
PAGE	C154	C158	C159	C160	C161	C162	C163	C165	C166	C167	C168
LENGTH	RIB PROCESSING	RIB PROCESSING	-	STUB LENGTH EXTENDED NECK	MINIATURE	-	STUB LENGTH EXTENDED NECK	MINIATURE	EXTENDED NECK	EXTENDED NECK	EXTENDED NECK
SURFACE TREATMENT	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating

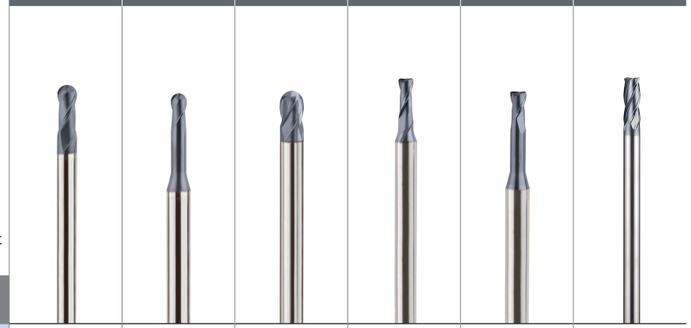


CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

MILLING TOOLS

	4G MILLS (Inch)					
SERIES	GMF15	GMF16	GMF17	GMF18	GMF19	GMF20
FLUTE	2	2	4	2	2	4
HELIX ANGLE	30°	30°	30°	30°	30°	27°/30° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R.002	R.004	R1/16	D3/64	D.008	D3/64
SIZE MAX	R3/8	R1/4	R1/4	D3/4	D3/4	D3/4
PAGE	C192	C194	C197	C198	C201	C207
LENGTH	-	NECK	-	-	NECK	-
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc					
P	1	Non-alloy steel	125		○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○
	3		250	25	○	○	○	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15						
	13		240	23						
	14		180	10						
K	15	Grey cast iron	180	10	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60							
	22		100							
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55	○	○	○	○	○	○
	39		630	60						
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○	○

	4G MILLS (Inch)											
SERIES	GMF21	GMF22	GMF23	GMF24	GMF25	GMF26	GMF27	GMF28	GMF29	G907 G928	G908 G929	G909 G930
FLUTE	4	2	2	2	4	4	4	4	6	4&5	4&5	4&5
HELIX ANGLE	27°/30° (MULTIPLE HELIX)	30°	30°	30°	27°/30° (MULTIPLE HELIX)	35°/38° (MULTIPLE HELIX)	30°	30°	45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°
CUTTING EDGE SHAPE	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING
SIZE MIN	D3/64	D.008	D.004	D3/64	D3/64	D3/64	D3/64	D3/64	D1/4	D1/4	D1/4	D1/4
SIZE MAX	D3/4	D1/2	D.120	D3/4	D3/4	D3/4	D1	D1/2	D3/4	D1	D1	D3/4
PAGE	C209	C214	C217	C220	C223	C224	C225	C228	C230	C231	C232	C233
LENGTH	NECK	NECK	-	LONG LENGTH	-	-	LONG LENGTH	NECK	-	STUB LENGTH	REGULAR LENGTH	EXTENDED REACH
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	X-Coating	X-Coating	X-Coating

○	○	○	○	○	○	○	○	○	○	○	○	1		
◎	○	○	○	○	○	○	○	○	○	○	○	2		
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	3		
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4		
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	5		
○	○	○	○	○	○	○	○	○	○	○	○	6	P	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	7		
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	8		
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9		
○	○	○	○	○	○	○	○	○	○	○	○	10		
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	11		
	○						○		○	○	○	12		
	○						○		○	○	○	13	M	
	○	○			○	○		○		○	○	14		
○	○	○	○	○	○	○	○	○	○	◎	◎	15		
○	○	○	○	○	○	○	○	○	○	◎	◎	16		
○	○	○	○	○	○	○	○	○	○	◎	◎	17		
○	○	○	○	○	○	○	○	○	○	◎	◎	18	K	
○	○	○	○	○	○	○	○	○	○	◎	◎	19		
○	○	○	○	○	○	○	○	○	○	◎	◎	20		
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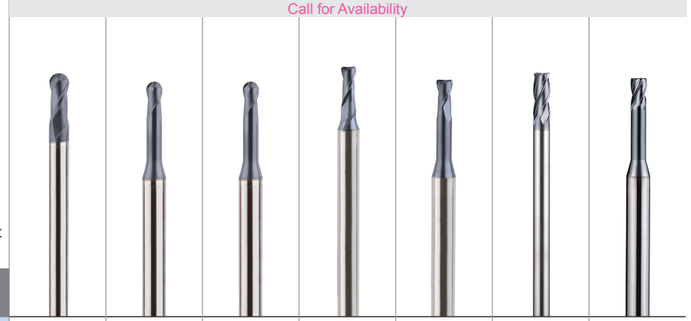
												36		
												37		
○	○	○	○	○	○	○	○	○	○			38		
												39	H	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	40		
○	○	○	○	○	○	○	○	○	○			41		

SELECTION GUIDE

MILLING TOOLS

	4G MILLS (Metric)						
SERIES	SEMD98	SEM846	SEM846	SEMD99	SEME61	SEME01	SEME64
FLUTE	2	2	2	2	2	4	4
HELIX ANGLE	30°	30°	30°	30°	30°	27°/30° (MULTIPL EHELIX)	27°/30° (MULTIPLE HELIX)
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R0.05	R0.05	R0.25	D0.2	D0.2	D1.0	D1.0
SIZE MAX	R12.5	R6.0	R1.0	D20.0	D20.0	D20.0	D20.0
PAGE	C234	C239	C247	C250	C256	C272	C278
LENGTH	-	LONG NECK	LONG NECK (6mm Shank)	-	LONG NECK	-	LONG NECK
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating
	Call for Availability						

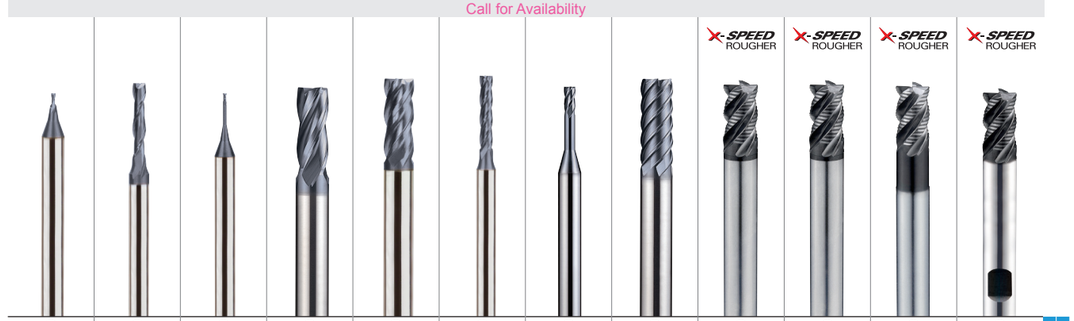


Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	◎
	3		250	25	○	○	○	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10							
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55	○	○	○	○	○	○	○
	39		630	60							
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○	○	○

	4G MILLS (Metric)										
SERIES	SEME35	SEME70	SEM845	SEME36	SEME71	SEME72	SEME73	SEME75	G9D75 G9D67	G9D76 G9D68	G9D77 G9D69	GAE53
FLUTE	2	2	2	4	4	4	4	6	4&5	4&5	4&5	4&5
HELIX ANGLE	30°	30°	30°	27°/30°	35°/38°	30°	30°	45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING
SIZE MIN	D0.1	D1.0	D0.1	D0.8	D1.0	D1.0	D1.0	D6.0	D6.0	D6.0	D6.0	D6.0
SIZE MAX	D25.0	D25.0	D12.0	D25.0	D20.0	D25.0	D12.0	D20.0	D20.0	D20.0	D20.0	D20.0
PAGE	C291	C296	C301	C309	C311	C314	C319	C324	C326	C327	C328	C329
LENGTH	-	LONG LENGTH	LONG NECK	-	-	LONG LENGTH	LONG NECK	-	SHORT LENGTH	LONG LENGTH	LONG REACH	SHORT LENGTH
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	X-Coating	X-Coating	X-Coating	X-Coating
	Call for Availability											



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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4		
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○	○	○	○	○	○	○	○	○	○	○	○	6	P	
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		○				○		○	○	○		13	M	
○		○	○	○		○		○	○	○	◎	14		
○	○	○	○	○	○	○	○	◎	◎	◎	◎	15		
○	○	○	○	○	○	○	○	◎	◎	◎	◎	16		
○	○	○	○	○	○	○	○	◎	◎	◎	◎	17		
○	○	○	○	○	○	○	○	◎	◎	◎	◎	18	K	
○	○	○	○	○	○	○	○	◎	◎	◎	◎	19		
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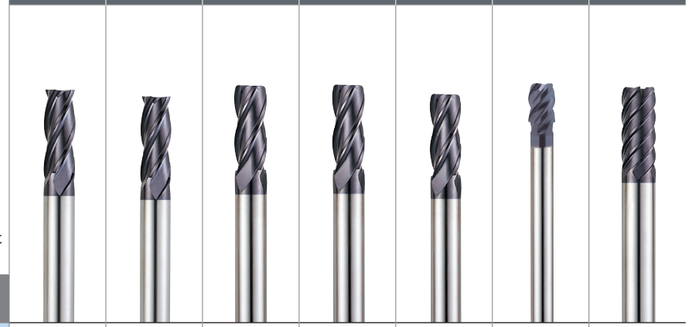
○	○	○	○	○	○	○	○	○					41	

SELECTION GUIDE

YG

MILLING TOOLS

	X-POWER PRO (Inch)						
SERIES	GM153	GM207	GM639	GM649	GM212	GM103	GM208
FLUTE	4	4	4	4	4	4	6&8
HELIX ANGLE	30°	30°	30°	30°	30°	45°	45°
CUTTING EDGE SHAPE	SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE
SIZE MIN	D1/16	D1/8	D1/16	D1/16	D1/4	D3/8	D1/4
SIZE MAX	D1	D1	D1/2	D1/2	D1/2	D7/8	D1
PAGE	C458	C459	C460	C461	C462	C463	C464
LENGTH	REGULAR LENGTH	LONG LENGTH	STUB LENGTH	REGULAR LENGTH	LONG LENGTH	LONG REACH	LONG LENGTH
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating



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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	○
	3		250	25	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○					○	
	13		240	23	○					○	
	14		180	10	○					○	
K	15	Grey cast iron	180	10							
	16		260	26							
	17	Nodular cast iron	160	3							
	18		250	25							
	19	Malleable cast iron	130								
	20		230	21							
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55	○	○	○	○	○	○	○
	39		630	60							
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○	○	○

	X-POWER PRO (Inch)												
SERIES	GM218	GM668	GM209	GM210	GM961	GM960	GM109	GM963	GM967	GM096	GM097	GM666	GM156
FLUTE	6&8	6&8	2	4	2	2	2	2	2	2	4	3~5	3~5
HELIX ANGLE	45°	45°	30°	30°	30°	30°	15°	30°	30°	30°	30°	20°	20°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	ROUGHING	ROUGHING
SIZE MIN	D1/4	D1/4	R1/64	R1/16	R1/16	R.012	R1/64	R1/32	R1/64	R1/16	R1/16	D1/4	D1/4
SIZE MAX	D1	D3/4	R3/8	R3/8	R1/2	R. 031	R1/4	R3/16	R1/16	R5/16	R5/16	D1	D1
PAGE	C464	C465	C466	C467	C468	C469	C470	C471	C472	C473	C474	C475	
LENGTH	EXTRA LONG LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH	MEDIUM LENGTH	MINIATURE	STUB CUT LENGTH	TAPER NECK	RIB PROCESSING	LONG LENGTH	LONG LENGTH	STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

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○	○	○	○	○	○	◎	○	○	○	○	○	○	38	H
										○	○		39	
◎	◎	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	40	
○	○	○	○	○	○	◎	○	○	○	○	○	○	41	

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

MILLING TOOLS

X-POWER PRO (Metric)

SERIES	GM876	GM813	GM886	GM902	GM815	GM818	GM8A1
FLUTE	2	2	2	2	4	2	2
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R0.5	R0.5	R0.25	R0.5	R1.0	D4.0	D1.0
SIZE MAX	R8.0	R10.0	R3.0	R4.0	R8.0	D12.0	D6.0
PAGE	C476	C477	C478	C480	C481	C482	C483
LENGTH	SHORT LENGTH	LONG LENGTH	RIB PROCESSING	TAPER NECK	LONG LENGTH	LONG LENGTH	RIB PROCESSING
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	○
	3		250	25	○	○	○	○	○	○	○
	4		270	28	◎	◎	◎	○	◎	◎	◎
	5		300	32	◎	◎	◎	○	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○
	7		275	29	◎	◎	◎	○	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel,	200	15	○	○	○	○	○	○	○
	11	and tool steel	325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10							
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55	○	○	○	○	○	○	○
	39		630	60				○			
	40	Chilled Cast Iron	400	42	◎	◎	◎	◎	◎	◎	◎
	41	Hardened Cast Iron	550	55	○	○	○	○	○	○	○

X-POWER PRO (Metric)

GM839	GM819	GM810	GM883	GM895	GM811	GM817	GM812	GM834	GM814
4	4	2	2	3	4	4	6&8	6	3&4
30°	30°	30°	30°	38°	30°	30°	45°	45°	20°
CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING
D2.0	D3.0	D0.4	D0.4	D1.0	D2.0	D2.0	D6.0	D6.0	D6.0
D12.0	D20.0	D20.0	D6.0	D16.0	D25.0	D20.0	D20.0	D25.0	D20.0
C484	C485	C486	C487	C489	C490	C491	C492	C493	C494
STUB LENGTH	LONG LENGTH	SHORT LENGTH	RIB PROCESSING	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH FINE PITCH
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

○	○	○	○	○	○	○	○	○	○	1	
○	○	○	○	○	○	○	○	○	○	2	
○	○	○	○	○	○	○	○	○	○	3	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	5	
○	○	○	○	○	○	○	○	○	○	6	P
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	7	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	8	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9	
○	○	○	○	○	○	○	○	○	○	10	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	11	
	○	○		○	○					12	
	○	○		○	○					13	M
	○	○		○	○				○	14	
○	○	○	○	○	○	○	○	○	○	15	
○	○	○	○	○	○	○	○	○	○	16	
○	○	○	○	○	○	○	○	○	○	17	K
○	○	○	○	○	○	○	○	○	○	18	
○	○	○	○	○	○	○	○	○	○	19	
○	○	○	○	○	○	○	○	○	○	20	
										21	
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										28	
										29	
										30	
										31	
										32	
										33	
										34	S
										35	
										36	
										37	
○	○	○	○	○	○	○	○	○	○	38	
										39	H
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	40	
○	○	○	○	○	○	○	○	○	○	41	

SELECTION GUIDE

YG

MILLING TOOLS

	TitaNox-POWER & HPC (Inch)						
SERIES	UGMG42	UGMG43	UGMH12	UGMG32	UGMG34	UGMH06	UGMH07
FLUTE	4	4	5			5	
HELIX ANGLE	43°/45° (MULTIPLE HELIX)		43°/44°/45° (MULTIPLE HELIX)			43°/44°/45° (MULTIPLE HELIX)	
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	SQUARE	CHAMFER	CORNER RADIUS	SQUARE	CORNER RADIUS
SIZE MIN	1/4	3/8	1/8	1/8	1/8	1/8	1/8
SIZE MAX	1	1	1-1/4	1	1-1/4	1	1
PAGE	C542	C543	C544			C546	
LENGTH	DOUBLE CORE STANDARD LENGTH		STANDARD LENGTH	STANDARD LENGTH		EXTENDED LENGTH	
SURFACE TREATMENT	Y-Coating		Y-Coating			Y-Coating	

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	○
	3		250	25	○	○	○	○	○	○	○
	4		270	28	○	○	○	○	○	○	○
	5		300	32	○	○	○	○	○	○	○
	6	Low alloy steel	180	10	○	○	○	○	○	○	○
	7		275	29	○	○	○	○	○	○	○
	8		300	32	○	○	○	○	○	○	○
	9		350	38	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○
	11		325	35	○	○	○	○	○	○	○
M	12	Stainless steel	200	15	◎	◎	◎	◎	◎	◎	◎
	13		240	23	◎	◎	◎	◎	◎	◎	◎
	14		180	10	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
	16		260	26	○	○	○	○	○	○	○
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
	18		250	25	○	○	○	○	○	○	○
	19	Malleable cast iron	130		○	○	○	○	○	○	○
	20		230	21	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110								
	27		90								
	28		100								
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○	○
	32		280	30	○	○	○	○	○	○	○
	33		250	25	○	○	○	○	○	○	○
	34		350	38	○	○	○	○	○	○	○
	35		320	34	○	○	○	○	○	○	○
	36	Titanium Alloys	400 Rm		◎	◎	◎	◎	◎	◎	◎
	37		1050 Rm		◎	◎	◎	◎	◎	◎	◎
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42							
	41	Hardened Cast Iron	550	55							

	TitaNox-POWER & HPC (Inch)		TitaNox-POWER & HPC (Metric)			JET-POWER (Inch)					
	EMI42	EMI43	GMG40	GMG24 GMG26	GMG28 GMG30	EH108	EE882	E5075 E5105	E5074 E5104	EH094	EH095
FLUTE	5		4	5		3&4	6	3	3	3~5	3~5
HELIX ANGLE	38°		43°/45° (MULTIPLE HELIX)	43°/44°/45° (MULTIPLE HELIX)		50°	35°	35°	35°	30°	30°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	CORNER RADIUS	CHAMFER	CORNER RADIUS	SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS	ROUGHING	ROUGHING
SIZE MIN	1/4	1/4	6.0	6.0	6.0	D1/8	D3/4	D1/8	D1/8	D1/4	D1/4
SIZE MAX	1	1	25.0	25.0	25.0	D1	D1-1/2	D1	D1	D1	D1
PAGE	C548		C550	C551		C564	C565	C566	C567	C568	C569
LENGTH	STANDARD LENGTH		EXTENDED LENGTH	STANDARD LENGTH		REGULAR LENGTH	REGULAR LENGTH	STUB LENGTH HOSS	REGULAR LENGTH HOSS	STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH
SURFACE TREATMENT	AlTiN		Y-Coating	Y-Coating		TiAlN	TiAlN	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	TiAlN	TiAlN
	TitaNox-POWER HPC					U.S.A Stock	Call for Availability	U.S.A Stock		U.S.A Stock	

												1
												2
						◎	◎	◎	◎	◎	◎	3
						◎	◎	◎	◎	◎	◎	4
						◎	◎			◎	◎	5
												6 P
						◎	◎	◎	◎	◎	◎	7
						◎	◎	◎	◎	◎	◎	8
						◎	◎			◎	◎	9
												10
						◎	◎			◎	◎	11
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	12
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	13 M
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	14
												15
												16
												17
												18 K
												19
												20
												21
												22
												23
												24
												25
												26 N
												27
												28
												29
												30
◎	◎	○	○	○	○	○			○	○		31
◎	◎	○	○	○	○	○			○	○		32
◎	◎	○	○	○	○	○			○	○		33
◎	◎	○	○	○	○	○			○	○		34 S
◎	◎	○	○	○	○	○			○	○		35
◎	◎	◎	◎	◎	◎	◎			◎	◎		36
◎	◎	◎	◎	◎	◎	◎			◎	◎		37
												38
												39
						○	○			○	○	40 H
												41

SELECTION GUIDE

YG

MILLING TOOLS

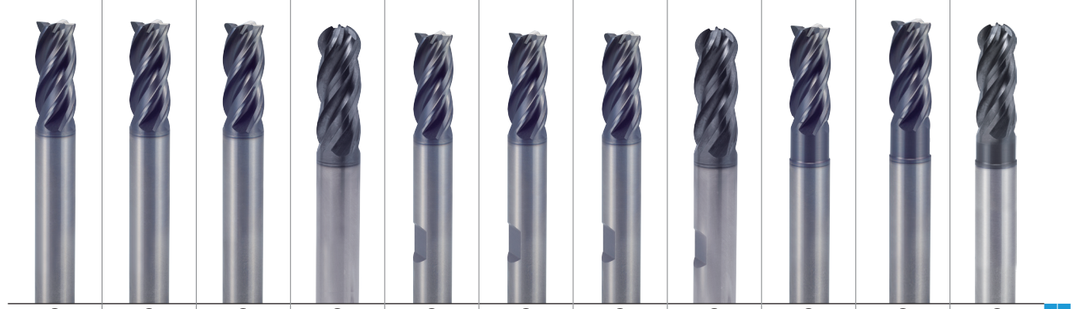
	JET-POWER (Inch)		JET-POWER (Metric)						
SERIES	EH969	EH970	EH830	EE515	EH852	EH831	EH917	EH919	EH921
FLUTE	3~6	4~6	3&4	4&6	3~5	3~5	4~6	3~6	4~6
HELIX ANGLE	45°	45°	50°	30°	30°	30°	45°	45°	45°
CUTTING EDGE SHAPE	ROUGHING	ROUGHING	SQUARE	SQUARE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
SIZE MIN	D3/16	D1/4	D6.0	D3.0	D6.0	D6.0	D6.0	D4.0	D6.0
SIZE MAX	D1	D3/4	D25.0	D25.0	D25.0	D25.0	D20.0	D25.0	D20.0
PAGE	C570	C571	C572	C573	C574	C575	C576	C577	C578
LENGTH	LONG LENGTH FINE PITCH	LONG REACH FINE PITCH	LONG LENGTH	SHORT LENGTH	STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH	FINE PITCH	LONG LENGTH FINE PITCH	LONG REACH FINE PITCH
SURFACE TREATMENT	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
	U.S.A Stock		Call for Availability						
				HSS-PM					

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125		○	○	○	○	○	○	○	○	○
	2		190	13	○	○	○	○	○	○	○	○	○
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	○	○	○	○	○	○	○	○	○
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	○	○	○	○	○	○	○	○	○
	11		325	35	◎	◎	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	◎
	13		240	23	◎	◎	◎	◎	◎	◎	◎	◎	◎
	14		180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10									
	16		260	26									
	17	Nodular cast iron	160	3									
	18		250	25									
	19	Malleable cast iron	130										
	20		230	21									
N	21	Aluminum-wrought alloy	60										
	22		100										
	23	Aluminum-cast, alloyed	75										
	24		90										
	25		130										
	26	Copper and Copper Alloys (Bronze / Brass)	110										
	27		90										
	28		100										
	29	Non Metallic Materials											
	30												
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○	○	○	○
	32		280	30	○	○	○	○	○	○	○	○	○
	33		250	25	○	○	○	○	○	○	○	○	○
	34		350	38	○	○	○	○	○	○	○	○	○
	35		320	34	○	○	○	○	○	○	○	○	○
	36	Titanium Alloys	400 Rm		◎	◎	◎	◎	◎	◎	◎	◎	◎
	37		1050 Rm		◎	◎	◎	◎	◎	◎	◎	◎	◎
H	38	Hardened steel	550	55									
	39		630	60									
	40	Chilled Cast Iron	400	42	○	○	○	○	○	○	○	○	○
	41	Hardened Cast Iron	550	55									

V7 PLUS A (Inch)											
UGMF68	UGMF76	UGMF70	UGMG53	UGMF69	UGMF77	UGMF71	UGMG54	UGMF72	UGMF74	UGMH10	
4				4				4			
35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	
SQUARE	CHAMFER	CORNER RADIUS	BALL NOSE	SQUARE	CHAMFER	CORNER RADIUS	BALL NOSE	SQUARE	CORNER RADIUS	BALL NOSE	
1/8	1/4	1/8	1/8	11/32	3/8	3/8	11/32	1/8	1/8	1/8	
1	1	1	1	1	1	1	1	1	1	1	
C600				C603				C604			
-				-				EXTENDED REACH			
Y-Coating				Y-Coating				Y-Coating			



◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	1	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	2	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	3	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	5	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	6	P
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	7	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	8	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	10	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	11	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	12	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	13	M
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	14	
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											40	
											41	

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

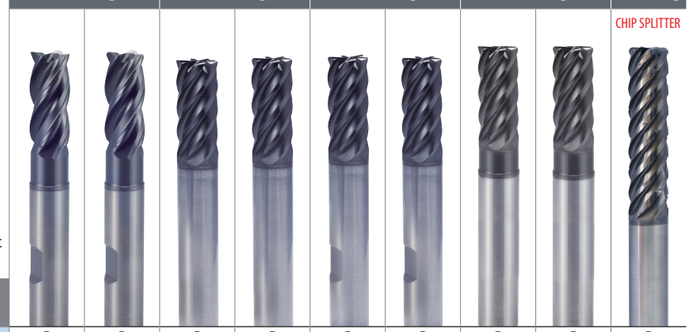
SELECTION GUIDE

YG

MILLING TOOLS

V7 PLUS A (Inch)

SERIES	UGMF73	UGMF75	UGMG20	UGMG22	UGMG21	UGMG23	UGMH08	UGMH09	GMH72
FLUTE	4		6		6		6		6
HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	45°	45°	45°	45°	45°	45°	45°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS
SIZE MIN	3/8	3/8	1/4	1/4	3/8	3/8	1/4	1/4	3/8
SIZE MAX	1	1	1	1	1	1	1	1	1
PAGE	C606		C611		C613		C614		C618
LENGTH	EXTENDED REACH		-		-		EXTENDED REACH		-
SURFACE TREATMENT	Y-Coating		Y-Coating		Y-Coating		Y-Coating		Y-Coating
									CHIP SPLITTER



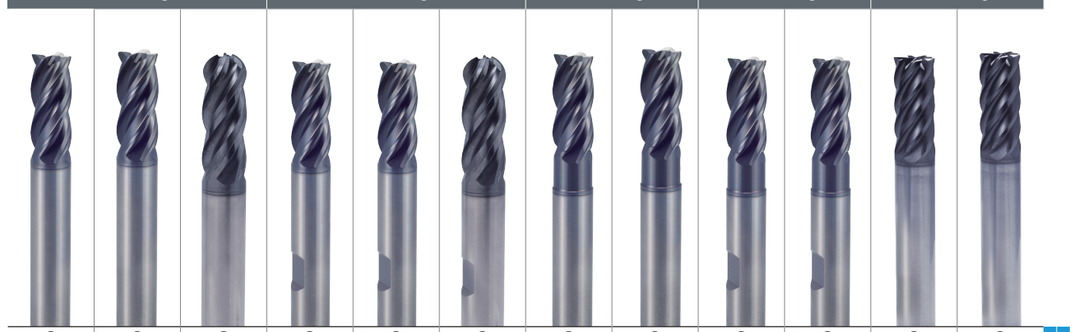
Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc									
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	◎
	11		325	35	◎	◎	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	◎
	13		240	23	◎	◎	◎	◎	◎	◎	◎	◎	◎
	14		180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130		◎	◎	◎	◎	◎	◎	◎	◎	◎
	20		230	21	◎	◎	◎	◎	◎	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	60										
	22		100										
	23	Aluminum-cast, alloyed	75										
	24		90										
	25		130										
	26	Copper and Copper Alloys (Bronze / Brass)	110										
	27		90										
	28		100										
	29	Non Metallic Materials											
	30												
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○	○	○	○
	32		280	30	○	○	○	○	○	○	○	○	○
	33		250	25	○	○	○	○	○	○	○	○	○
	34		350	38	○	○	○	○	○	○	○	○	○
	35		320	34	○	○	○	○	○	○	○	○	○
	36	Titanium Alloys	400 Rm		○	○	○	○	○	○	○	○	○
	37		1050 Rm		○	○	○	○	○	○	○	○	○
H	38	Hardened steel	550	55									
	39		630	60									
	40	Chilled Cast Iron	400	42									
	41	Hardened Cast Iron	550	55									

V7 PLUS A (Metric)

SERIES	GMF52 GMF56	GMF54 GMF58	GMG55	GMF53 GMF57	GMF55 GMF59	GMG56	GMF60	GMF62	GMF61	GMF63	GMG12 GMG14	GMG16 GMG18
FLUTE	4			4			4		4		6	
HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	45°	45°
CUTTING EDGE SHAPE	CHAMFER	CORNER RADIUS	BALL NOSE	CHAMFER	CORNER RADIUS	BALL NOSE	CHAMFER	CORNER RADIUS	CHAMFER	CORNER RADIUS	SQUARE	CORNER RADIUS
SIZE MIN	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.0	6.0
SIZE MAX	25.0	25.0	25.0	25.0	25.0	25.0	20.0	20.0	20.0	20.0	25.0	25.0
PAGE	C607			C608			C609		C610		C616	
LENGTH	-			-			EXTENDED REACH		EXTENDED REACH		-	
SURFACE TREATMENT	Y-Coating			Y-Coating			Y-Coating		Y-Coating		Y-Coating	



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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	2	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	3	
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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9	
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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	12	
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◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	16	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	17	
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○	○	○	○	○	○	○	○	○	○	○	○	35	
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												39	H
												40	
												41	

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
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TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
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ALU-POWER END MILLS
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STANDARD CARBIDE
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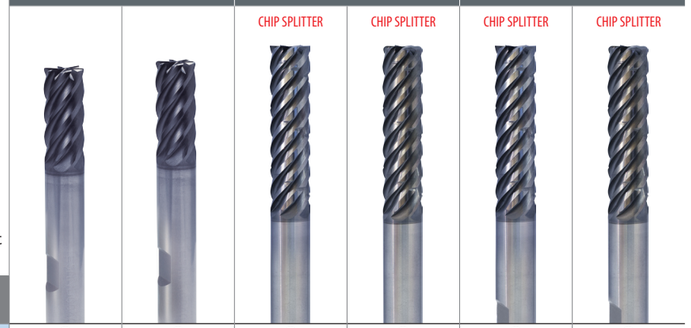
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

MILLING TOOLS

V7 PLUS A (Metric)

SERIES	GMG13 GMG15	GMG17 GMG19	GMH56	GMH58	GMH57	GMH59
FLUTE	6		6		6	
HELIX ANGLE	45°	45°	45°	45°	45°	45°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS
SIZE MIN	6.0	6.0	6.0	6.0	6.0	6.0
SIZE MAX	25.0	25.0	25.0	25.0	25.0	25.0
PAGE	C617		C619		C620	
LENGTH	-		-		-	
SURFACE TREATMENT	Y-Coating		Y-Coating		Y-Coating	
			CHIP SPLITTER	CHIP SPLITTER	CHIP SPLITTER	CHIP SPLITTER



Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎
	5		300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎
	8		300	32	◎	◎	◎	◎	◎	◎
	9		350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎
	11		325	35	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	◎	◎	◎	◎	◎	◎
	13		240	23	◎	◎	◎	◎	◎	◎
	14		180	10	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130		◎	◎	◎	◎	◎	◎
	20		230	21	◎	◎	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	60							
	22		100							
	23	Aluminum-cast, alloyed	75							
	24		90							
	25		130							
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials								
	30									
S	31	Heat Resistant Super Alloys	200	15	○	○	○	○	○	○
	32		280	30	○	○	○	○	○	○
	33		250	25	○	○	○	○	○	○
	34		350	38	○	○	○	○	○	○
	35		320	34	○	○	○	○	○	○
	36	Titanium Alloys	400 Rm		○	○	○	○	○	○
	37		1050 Rm		○	○	○	○	○	○
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

V7 MILL INOX (Inch)

	EMC75 EMD60	EMC76 EMD61	EMB12 EMB37	EMB13 EMB38	EMB20	EMB78 EMB79	EMB76 EMB77
FLUTE	4	4	4	4	4	4	5
HELIX ANGLE	SINUSOIDAL						
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	BALL NOSE	SQUARE
SIZE MIN	D1/8	D1/8	D1/8	D1/8	D1/4	R1/16	D1/4
SIZE MAX	D1	D1	D1	D1	D1	R1/2	D1
PAGE	C634	C635	C636	C637	C638	C639	C640
LENGTH	STUB LENGTH	STUB LENGTH	REGULAR LENGTH	REGULAR LENGTH	EXTENDED LENGTH LONG REACH	REGULAR LENGTH	REGULAR LENGTH
SURFACE TREATMENT	AlTiN						
	U.S.A Stock						

V7 MILL INOX (Metric)

	EMB41 EMB42	EMB43 EMB44	EMB14 EMB39	EMB15 EMB40	EMB74 EMB75	EMB72 EMB73
FLUTE	4	4	4	4	4	5
HELIX ANGLE	SINUSOIDAL					
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	BALL NOSE	SQUARE
SIZE MIN	D3.0	D3.0	D3.0	D3.0	R1.5	D6.0
SIZE MAX	D20.0	D20.0	D25.0	D25.0	R12.5	D25.0
PAGE	C641	C642	C643	C644	C645	C646
LENGTH	SHORT LENGTH	SHORT LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH
SURFACE TREATMENT	AlTiN					
	Call for Availability					

ISO														
P	1	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	1
	2	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	2
	3	○	○	○	○	○	○	○	○	○	○	○	○	3
	4	○	○	○	○	○	○	○	○	○	○	○	○	4
	5	○	○	○	○	○	○	○	○	○	○	○	○	5
	6	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	6
	7	○	○	○	○	○	○	○	○	○	○	○	○	7
	8	○	○	○	○	○	○	○	○	○	○	○	○	8
	9	○	○	○	○	○	○	○	○	○	○	○	○	9
	10	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	10
	11	○	○	○	○	○	○	○	○	○	○	○	○	11
M	12	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	12
	13	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	13
	14	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	14
K	15													15
	16													16
	17													17
	18													18
	19													19
	20													20
N	21													21
	22													22
	23													23
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	25													25
	26													26
	27													27
	28													28
	29													29
	30													30
S	31	○	○	○	○	○	○	○	○	○	○	○	○	31
	32	○	○	○	○	○	○	○	○	○	○	○	○	32
	33	○	○	○	○	○	○	○	○	○	○	○	○	33
	34	○	○	○	○	○	○	○	○	○	○	○	○	34
	35	○	○	○	○	○	○	○	○	○	○	○	○	35
	36	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	36
	37	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	37
H	38													38
	39													39
	40													40
	41													41

SELECTION GUIDE

YG

MILLING TOOLS

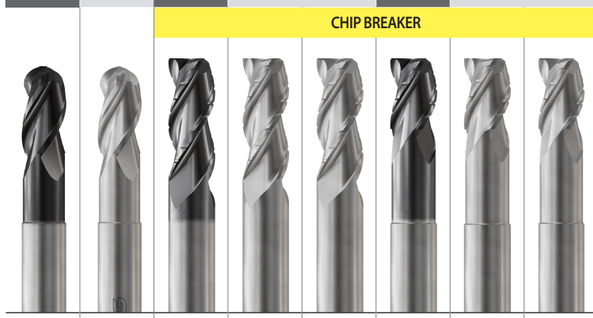
	ALU-POWER HPC									
SERIES	JAG95	JAG97	E5G95	E5G97	JAG96	JAG98	E5G96	E5G98	JAI58	E5I58
FLUTE	3		3		3		3		3	
HELIX ANGLE	37°		37°		37°		37°		37°	
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	BALL NOSE	
SIZE MIN	1/8	1/8	1/8	1/8	1/4	1/4	1/4	1/4	R1/16	R1/16
SIZE MAX	1	1	1	1	1	1	1	1	R1/2	R1/2
PAGE	C658		C660		C662		C663		C664	
LENGTH	STANDARD LENGTH		STANDARD LENGTH		EXTENDED NECK		EXTENDED NECK		STANDARD LENGTH	
SURFACE TREATMENT	DLC		Uncoated		DLC		Uncoated		DLC	Uncoated

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc									
P	1	Non-alloy steel	125										
	2		190	13									
	3		250	25									
	4		270	28									
	5		300	32									
	6	Low alloy steel	180	10									
	7		275	29									
	8		300	32									
	9		350	38									
	10	High alloyed steel, and tool steel	200	15									
	11		325	35									
M	12	Stainless steel	200	15									
	13		240	23									
	14		180	10									
K	15	Grey cast iron	180	10									
	16		260	26									
	17	Nodular cast iron	160	3									
	18		250	25									
	19	Malleable cast iron	130										
	20		230	21									
N	21	Aluminum-wrought alloy	60		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	22		100		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	23	Aluminum-cast, alloyed	75		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	24		90		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	25		130		○	○	○	○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○	○	○	○
	29	Non Metallic Materials			○	○	○	○	○	○	○	○	○	○
	30													
S	31	Heat Resistant Super Alloys	200	15									
	32		280	30									
	33		250	25									
	34		350	38									
	35		320	34									
	36	Titanium Alloys	400 Rm										
	37		1050 Rm										
H	38	Hardened steel	550	55									
	39		630	60									
	40	Chilled Cast Iron	400	42									
	41	Hardened Cast Iron	550	55									

	ALU-POWER HPC								ALU-POWER (Inch)					
SERIES	JAI59	E5I59	JAI38	E5I36	E5I38	JAI39	E5I37	E5I39	E5253	E5254	E5976	E5980	E5981	E5983
FLUTE	3		3	3		3	3		2	2	2	3	3	3
HELIX ANGLE	37°		37°	37°		37°	37°		42°	42°	37°	45°	45°	45°
CUTTING EDGE SHAPE	BALL NOSE		CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS
SIZE MIN	R3/16	R3/16	1/8	1/2	1/8	1/4	1/2	1/4	D1/4	D1/16	D1/4	D1/8	D1/8	D1/2
SIZE MAX	R1/2	R1/2	1	3/4	1	1	1/2	1	D1	D1	D1	D1	D1	D1
PAGE	C665		C666	C667		C668	C669		C678	C679	C680	C681	C682	
LENGTH	EXTENDED NECK		STANDARD LENGTH	STANDARD LENGTH		EXTENDED NECK	EXTENDED NECK	EXTENDED NECK	REGULAR LENGTH	REGULAR LENGTH	EXTENDED NECK	STUB LENGTH	REGULAR LENGTH	REGULAR LENGTH
SURFACE TREATMENT	DLC	Uncoated	DLC	Uncoated		DLC	Uncoated		TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
			CHIP BREAKER						Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
									U.S.A Stock					
									BANSHEE					



P	1														1
	2														2
	3														3
	4														4
	5														5
	6														6
	7														7
	8														8
	9														9
	10														10
	11														11
M	12														12
	13														13
	14														14
K	15														15
	16														16
	17														17
	18														18
	19														19
	20														20
N	21	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	21
	22	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	22
	23	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	23
	24	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	24
	25	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	25
	26	○	○	○	○	○	○	○							26
	27	○	○	○	○	○	○	○							27
	28	○	○	○	○	○	○	○							28
	29	○	○	○	○	○	○	○							29
	30														30
S	31														31
	32														32
	33														33
	34														34
	35														35
	36														36
	37														37
H	38														38
	39														39
	40														40
	41														41

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MILLING TOOLS

	ALU-POWER (Inch)										
SERIES	E5982	E5984	E5E44	E5E98	E5E45	E5977	E5985	E5973	E5974	E5978	E5975
FLUTE	3	3	3	3	3	3	3	2	3	2	3
HELIX ANGLE	45°	45°	30°	30°	30°	37°	37°	30°	50°	37°	40°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	ROUGHING	ROUGHING	BALL NOSE ROUGHING	SQUARE	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	D1/4	D1/2	D1/4	D1/4	D1/4	D1/4	D1/2	D5/32	R1/8	R1/8	R3/64
SIZE MAX	D1	D1	D1	D1	D1	D1	D1	D3/4	R3/8	R1/2	R5/16
PAGE	C683		C684		C685	C686	C687	C688	C689	C690	C691
LENGTH	LONG LENGTH	LONG LENGTH	-	NECK	-	EXTENDED NECK	EXTENDED NECK	NECK	STUB CUT LENGTH NECK	LONG REACH	LONG LENGTH NECK
SURFACE TREATMENT	TiCN	TiCN	Uncoated	Uncoated	Uncoated	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
	Uncoated	Uncoated				Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	U.S.A Stock										

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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc										
P	1	Non-alloy steel	125											
	2		190	13										
	3		250	25										
	4		270	28										
	5		300	32										
	6	Low alloy steel	180	10										
	7		275	29										
	8		300	32										
	9		350	38										
	10	High alloyed steel, and tool steel	200	15										
	11		325	35										
M	12	Stainless steel	200	15										
	13		240	23										
	14		180	10										
K	15	Grey cast iron	180	10										
	16		260	26										
	17	Nodular cast iron	160	3										
	18		250	25										
	19	Malleable cast iron	130											
	20		230	21										
N	21	Aluminum-wrought alloy	60		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	22		100		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	23	Aluminum-cast, alloyed	75		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	24		90		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	25		130		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	26	Copper and Copper Alloys (Bronze / Brass)	110											
	27		90											
	28		100											
	29	Non Metallic Materials												
	30													
S	31	Heat Resistant Super Alloys	200	15										
	32		280	30										
	33		250	25										
	34		350	38										
	35		320	34										
	36	Titanium Alloys	400 Rm											
	37		1050 Rm											
H	38	Hardened steel	550	55										
	39		630	60										
	40	Chilled Cast Iron	400	42										
	41	Hardened Cast Iron	550	55										

	ALU-POWER (Metric)					ALU-POWER (Inch)								ALU-POWER (Metric)	
	E5522 EG522	EG930	EG909	EG910	EG908	EK191	EK191	EK226	EK226	EK192	EK192	EK196	EK193 EK132	EP922	EP924
FLUTE	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
HELIX ANGLE	45°	25°	30°	50°	40°	42°	42°	42°	42°	42°	42°	42°	42°	42°	42°
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	ROUGHING	CORNER RADIUS ROUGHING	ROUGHING	CORNER RADIUS ROUGHING	ROUGHING	CORNER RADIUS ROUGHING	BALL NOSE ROUGHING	CORNER RADIUS	ROUGHING	ROUGHING
SIZE MIN	D3.0	D2.0	D4.0	R3.0	R1.0	D1/2	D3/4	D3/4	D3/4	D1/2	D3/4	R1/4	D1/2	D12.0	D12.0
SIZE MAX	D20.0	D20.0	D20.0	R10.0	R8.0	D2	D1-1/4	D2	D1-1/4	D2	D1-1/4	R5/8	D1-1/2	D32.0	D32.0
PAGE	C692	C693	C694	C695	C696	C697		C698		C699		C701	C702	C704	C705
LENGTH	LONG LENGTH	STUB CUT LENGTH	STUB CUT LENGTH NECK	STUB CUT LENGTH NECK	LONG LENGTH NECK	REGULAR LENGTH		MEDIUM LENGTH		LONG LENGTH		REGULAR LENGTH	REGULAR & MEDIUM & LONG LENGTH	SHORT LENGTH	LONG LENGTH
SURFACE TREATMENT	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN		TiCN		TiCN		TiCN	TiCN	TiAlN	TiAlN
	Uncoated					Uncoated		Uncoated		Uncoated		Uncoated	Uncoated		
	Call for Availability					U.S.A Stock								Call for Availability	
						HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM

1																P
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																M
13																
14																
15																K
16																
17																
18																
19																
20																
21	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	N
22	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
23	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
24	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
25	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
26																
27																
28																
29																
30																
31																S
32																
33																
34																
35																
36																
37																
38																H
39																
40																
41																

SELECTION GUIDE

YG MILLING TOOLS

	D-POWER GRAPHITE (Inch)					
SERIES	EI107	EI099	EI106	EI971	EI972	EIB07
FLUTE	2&4	2	4	2	2	4
HELIX ANGLE	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	D1/64	R.0391	R.0391	R.0391	R.0391	R.0156
SIZE MAX	D1/2	R1/4	R1/4	R1/4	R5/32	R.0625
PAGE	C720	C721		C722	C723	C724
LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	LONG LENGTH	LONG REACH	REGULAR LENGTH NECK
SURFACE TREATMENT	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond
	U.S.A Stock					

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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc						
P	1	Non-alloy steel	125							
	2		190	13						
	3		250	25						
	4		270	28						
	5		300	32						
	6	Low alloy steel	180	10						
	7		275	29						
	8		300	32						
	9		350	38						
	10	High alloyed steel, and tool steel	200	15						
	11		325	35						
M	12	Stainless steel	200	15						
	13		240	23						
	14		180	10						
K	15	Grey cast iron	180	10						
	16		260	26						
	17	Nodular cast iron	160	3						
	18		250	25						
	19	Malleable cast iron	130							
	20		230	21						
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○
	22		100		○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○
	24		90		○	○	○	○	○	○
	25		130		○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110							
	27		90							
	28		100							
	29	Non Metallic Materials			◎	◎	◎	◎	◎	◎
	30									
S	31	Heat Resistant Super Alloys	200	15						
	32		280	30						
	33		250	25						
	34		350	38						
	35		320	34						
	36	Titanium Alloys	400 Rm							
	37		1050 Rm							
H	38	Hardened steel	550	55						
	39		630	60						
	40	Chilled Cast Iron	400	42						
	41	Hardened Cast Iron	550	55						

D-POWER GRAPHITE (Inch)		D-POWER GRAPHITE (Metric)				STANDARD CARBIDE (Inch)				
EIB05	EIB06	EI880	EI881	EI451	EI450	UGMF90	E5020	UGMF89	E5021	E5244
4	4	2	3	2	2	2	2	4	4	2
30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°
CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
D1/16	D1/32	R1.0	R1.0	R1.0	R1.0	D1/8	D1/32	D1/16	D1/16	D1/16
D1/2	D3/8	R6.0	R6.0	R6.0	R4.0	D1	D1	D1	D1	D3/4
C725	C726	C727		C728	C729	C738	C739	C740	C741	C742
REGULAR LENGTH	REGULAR LENGTH NECK	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG REACH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	STUB LENGTH
Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Y-Coating	Uncoated / TiN / TiCN / TYLON F / TYLON E	Y-Coating	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E
U.S.A Stock		Call for Availability								

ISO											
P	1					◎	◎	◎	◎	◎	1
	2					◎	◎	◎	◎	◎	2
	3					◎	◎	◎	◎	◎	3
	4					◎	◎	◎	◎	◎	4
	5					○	◎	◎	◎	◎	5
	6					◎	◎	◎	◎	◎	6 P
	7					◎	◎	◎	◎	◎	7
	8					○	◎	◎	◎	◎	8
	9					◎	◎	◎	◎	◎	9
	10					◎	◎	◎	◎	◎	10
	11					○	◎	◎	◎	◎	11
M	12					○	○	○	○	○	12
	13					○	○	○	○	○	13 M
	14					○	○	○	○	○	14
K	15					○	○	○	○	○	15
	16					○	○	○	○	○	16
	17					○	○	○	○	○	17
	18					○	○	○	○	○	18 K
	19					○	○	○	○	○	19
	20					○	○	○	○	○	20
N	21	○	○	○	○	○	○	○	○	○	○	21
	22	○	○	○	○	○	○	○	○	○	○	22
	23	○	○	○	○	○	○	○	○	○	○	23
	24	○	○	○	○	○	○	○	○	○	○	24
	25	○	○	○	○	○	○	○	○	○	○	25
	26							○	○	○	○	○	26 N
	27							○	○	○	○	○	27
	28							○	○	○	○	○	28
	29	◎	◎	◎	◎	◎	◎						29
	30												30
S	31												31
	32												32
	33												33
	34												34 S
	35												35
	36												36
	37												37
H	38												38
	39												39 H
	40												40
	41												41

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

MILLING TOOLS

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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	UGMGF57	E5245	E5011	E5012	UGMGF58	E5026	UGMGF59
		STANDARD CARBIDE (Inch)									
		SERIES			UGMGF57	E5245	E5011	E5012	UGMGF58	E5026	UGMGF59
		FLUTE			4	4	2	4	4	2	4
		HELIX ANGLE			30°	30°	30°	30°	30°	30°	30°
		CUTTING EDGE SHAPE			SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
		SIZE MIN			D1/16	D1/16	D1/8	D1/8	D1/8	D1/8	D1/8
		SIZE MAX			D3/4	D3/4	D1	D1	D1	D1	D1
		PAGE			C743	C744	C745	C745	C746	C747	C748
		LENGTH			STUB LENGTH	STUB LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH
		SURFACE TREATMENT			Y-Coating	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Y-Coating	Uncoated / TiN / TiCN / TYLON F / TYLON E	Y-Coating
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎
P	2	Non-alloy steel	190	13	◎	◎	◎	◎	◎	◎	◎
P	3	Non-alloy steel	250	25	◎	◎	◎	◎	◎	◎	◎
P	4	Non-alloy steel	270	28	◎	◎	◎	◎	◎	◎	◎
P	5	Non-alloy steel	300	32	◎	◎	◎	◎	◎	◎	◎
P	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎
P	7	Low alloy steel	275	29	◎	◎	◎	◎	◎	◎	◎
P	8	Low alloy steel	300	32	◎	◎	◎	◎	◎	◎	◎
P	9	Low alloy steel	350	38	◎	◎	◎	◎	◎	◎	◎
P	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎
P	11	High alloyed steel, and tool steel	325	35	◎	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	200	15	○	○	○	○	○	○	○
M	13	Stainless steel	240	23	○	○	○	○	○	○	○
M	14	Stainless steel	180	10	○	○	○	○	○	○	○
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○
K	16	Grey cast iron	260	26	○	○	○	○	○	○	○
K	17	Nodular cast iron	160	3	○	○	○	○	○	○	○
K	18	Nodular cast iron	250	25	○	○	○	○	○	○	○
K	19	Malleable cast iron	130		○	○	○	○	○	○	○
K	20	Malleable cast iron	230	21	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○
N	22	Aluminum-wrought alloy	100		○	○	○	○	○	○	○
N	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○
N	24	Aluminum-cast, alloyed	90		○	○	○	○	○	○	○
N	25	Aluminum-cast, alloyed	130		○	○	○	○	○	○	○
N	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○
N	27	Copper and Copper Alloys (Bronze / Brass)	90		○	○	○	○	○	○	○
N	28	Copper and Copper Alloys (Bronze / Brass)	100		○	○	○	○	○	○	○
N	29	Non Metallic Materials									
N	30	Non Metallic Materials									
S	31	Heat Resistant Super Alloys	200	15							
S	32	Heat Resistant Super Alloys	280	30							
S	33	Heat Resistant Super Alloys	250	25							
S	34	Heat Resistant Super Alloys	350	38							
S	35	Heat Resistant Super Alloys	320	34							
S	36	Titanium Alloys	400 Rm								
S	37	Titanium Alloys	1050 Rm								
H	38	Hardened steel	550	55							
H	39	Hardened steel	630	60							
H	40	Chilled Cast Iron	400	42							
H	41	Hardened Cast Iron	550	55							

ISO	VDI 3323	Material Description	HB	HRc	E5065	E5022	E5023	E5025	E5024	E5249	E5250	UGMF91	E5014
		STANDARD CARBIDE (Inch)											
		SERIES			E5065	E5022	E5023	E5025	E5024	E5249	E5250	UGMF91	E5014
		FLUTE			4	2	4	2	4	2	4	4	2
		HELIX ANGLE			30°	30°	30°	30°	30°	30°	30°	30°	45°
		CUTTING EDGE SHAPE			SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
		SIZE MIN			D1/8	D1/32	D1/16	D1/8	D1/8	R1/16	R1/16	R1/16	R1/16
		SIZE MAX			D1	D1/2	D1/2	D1/2	D1/2	R1/2	R1/2	R1/2	R1/2
		PAGE			C749	C750	C751	C752	C753	C754	C755	C756	C757
		LENGTH			EXTRA LONG LENGTH	STUB LENGTH DOUBLE	STUB LENGTH DOUBLE	REGULAR LENGTH DOUBLE	REGULAR LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	LONG LENGTH
		SURFACE TREATMENT			Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Uncoated / TiN / TiCN / TYLON F / TYLON E	Y-Coating	Uncoated / TiN / TiCN / TYLON F / TYLON E
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎	◎
P	2	Non-alloy steel	190	13	◎	◎	◎	◎	◎	◎	◎	◎	◎
P	3	Non-alloy steel	250	25	◎	◎	◎	◎	◎	◎	◎	◎	◎
P	4	Non-alloy steel	270	28	◎	◎	◎	◎	◎	◎	◎	◎	◎
P	5	Non-alloy steel	300	32	◎	◎	◎	◎	◎	◎	◎	○	◎
P	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎	◎
P	7	Low alloy steel	275	29	◎	◎	◎	◎	◎	◎	◎	◎	◎
P	8	Low alloy steel	300	32	◎	◎	◎	◎	◎	◎	◎	○	◎
P	9	Low alloy steel	350	38	◎	◎	◎	◎	◎	◎	◎	○	◎
P	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	◎
P	11	High alloyed steel, and tool steel	325	35	◎	◎	◎	◎	◎	◎	◎	○	◎
M	12	Stainless steel	200	15	○	○	○	○	○			○	
M	13	Stainless steel	240	23	○	○	○	○	○			○	
M	14	Stainless steel	180	10	○	○	○	○	○			○	
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○	○	○
K	16	Grey cast iron	260	26	○	○	○	○	○	○	○	○	○
K	17	Nodular cast iron	160	3	○	○	○	○	○	○	○	○	○
K	18	Nodular cast iron	250	25	○	○	○	○	○	○	○	○	○
K	19	Malleable cast iron	130		○	○	○	○	○	○	○	○	○
K	20	Malleable cast iron	230	21	○	○	○	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○	○	○
N	22	Aluminum-wrought alloy	100		○	○	○	○	○	○	○	○	○
N	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○	○	○
N	24	Aluminum-cast, alloyed	90		○	○	○	○	○	○	○	○	○
N	25	Aluminum-cast, alloyed	130		○	○	○	○	○	○	○	○	○
N	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○				
N	27	Copper and Copper Alloys (Bronze / Brass)	90		○	○	○	○	○				
N	28	Copper and Copper Alloys (Bronze / Brass)	100		○	○	○	○	○				
N	29	Non Metallic Materials											
N	30	Non Metallic Materials											
S	31	Heat Resistant Super Alloys	200	15									
S	32	Heat Resistant Super Alloys	280	30									
S	33	Heat Resistant Super Alloys	250	25									
S	34	Heat Resistant Super Alloys	350	38									
S	35	Heat Resistant Super Alloys	320	34									
S	36	Titanium Alloys	400 Rm										
S	37	Titanium Alloys	1050 Rm										
H	38	Hardened steel	550	55									
H	39	Hardened steel	630	60									
H	40	Chilled Cast Iron	400	42									
H	41	Hardened Cast Iron	550	55									

SELECTION GUIDE

YG

MILLING TOOLS

	STANDARD CARBIDE (Inch)						
SERIES	E5060	E5018	E5062	E5251 E5252	E5216	E5069	E5243
FLUTE	4	2	4	2&4	4	5	3
HELIX ANGLE	30°	30°	30°	30°	30°	45°	45°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	SQUARE
SIZE MIN	R1/16	R1/16	R1/16	R7/64	D1/8	D1/4	D1/8
SIZE MAX	R1/2	R1/2	R1/2	R1/4	D1	D1	D1
PAGE	C757	C758	C759	C760	C761	C763	C764
LENGTH	LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	STUB LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	TiN	TiN	TiN	TiN	TYLON F		TiN
	TiCN	TiCN	TiCN	TiCN			TiCN
	TYLON F	TYLON F	TYLON F	TYLON F			TYLON F
	TYLON E	TYLON E	TYLON E	TYLON E			TYLON E

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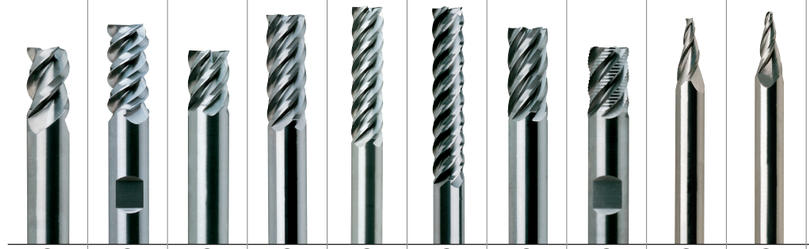
◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	E5060	E5018	E5062	E5251 E5252	E5216	E5069	E5243	
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	1
	2		190	13	◎	◎	◎	◎	◎	◎	◎	2
	3		250	25	◎	◎	◎	◎	◎	◎	◎	3
	4		270	28	◎	◎	◎	◎	◎	◎	◎	4
	5		300	32	◎	◎	◎	◎	◎	◎	◎	5
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	6
	7		275	29	◎	◎	◎	◎	◎	◎	◎	7
	8		300	32	◎	◎	◎	◎	◎	◎	◎	8
	9		350	38	◎	◎	◎	◎	◎	◎	◎	9
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	10
	11		325	35	◎	◎	◎	◎	◎	◎	◎	11
M	12	Stainless steel	200	15					○	◎	◎	12
	13		240	23					○	◎	◎	13
	14		180	10					○	◎	◎	14
K	15	Grey cast iron	180	10	○	○	○	○	○	○	○	15
	16		260	26	○	○	○	○	○	○	○	16
	17	Nodular cast iron	160	3	○	○	○	○	○	○	○	17
	18		250	25	○	○	○	○	○	○	○	18
	19	Malleable cast iron	130		○	○	○	○	○	○	○	19
	20		230	21	○	○	○	○	○	○	○	20
N	21	Aluminum-wrought alloy	60		○	○	○	○	○			21
	22		100		○	○	○	○	○			22
	23	Aluminum-cast, alloyed	75		○	○	○	○	○			23
	24		90		○	○	○	○	○			24
	25		130		○	○	○	○	○			25
	26	Copper and Copper Alloys (Bronze / Brass)	110						○	○	○	26
	27		90						○	○	○	27
	28		100						○	○	○	28
	29	Non Metallic Materials										29
	30											30
S	31	Heat Resistant Super Alloys	200	15						○	○	31
	32		280	30						○	○	32
	33		250	25						○	○	33
	34		350	38						○	○	34
	35		320	34						○	○	35
	36	Titanium Alloys	400 Rm							○	○	36
	37		1050 Rm							○	○	37
H	38	Hardened steel	550	55								38
	39		630	60								39
	40	Chilled Cast Iron	400	42						○	○	40
	41	Hardened Cast Iron	550	55								41

	STANDARD CARBIDE (Inch)										STANDARD CARBIDE (Metric)			
SERIES	E5059	E5246	E5066	E5067	E5068	E5073	E5058	E5056 E5057	E5077	E5078	EH527	EH540	EH882	
FLUTE	3	3	5	5	5	5	6	5	3	3	2	4	3	
HELIX ANGLE	50°	60°	45°	45°	45°	45°	40°	45°	30°	30°	≈30°	≈30°	35°	
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING	TAPER	TAPER BALL NOSE	SQUARE	SQUARE	CORNER RADIUS	
SIZE MIN	D1/4	D1/8	D1/8	D1/8	D1/4	D5/16	D3/16	D3/8	D3/32	R.047	D3.5	D3.5	D3.0	
SIZE MAX	D3/4	D1	D1	D1	D1	D1	D3/4	D1	D1/4	R.125	D20.0	D20.0	D20.0	
PAGE	C765	C766	C767	C768	C769	C770	C771	C772	C773	C774	C775	C776	C777	
LENGTH	STUB & REGULAR & LONG LENGTH	REGULAR LENGTH	STUB LENGTH	REGULAR LENGTH	MEDIUM & LONG LENGTH	EXTRA LONG LENGTH	REGULAR LENGTH	STUB & REGULAR LENGTH	-	-	LONG LENGTH	LONG LENGTH	-	
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	TiAlN	TiAlN	TiAlN	
	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN				
	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN				
	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F				
	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E				



E5059	E5246	E5066	E5067	E5068	E5073	E5058	E5056 E5057	E5077	E5078	EH527	EH540	EH882	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	1
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	2
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	3
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	4
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	5
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	6
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	7
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	8
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	9
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	10
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	11
◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○		12
◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○		13
◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○		14
○	○	○	○	○	○	○		○	○	○	○	○	15
○	○	○	○	○	○	○		○	○	○	○	○	16
○	○	○	○	○	○	○		○	○	○	○	○	17
○	○	○	○	○	○	○		○	○	○	○	○	18
○	○	○	○	○	○	○		○	○	○	○	○	19
○	○	○	○	○	○	○		○	○	○	○	○	20
								○	○	○	○	◎	21
								○	○	○	○	◎	22
								○	○	○	○	◎	23
								○	○	○	○	◎	24
								○	○	○	○	◎	25
○	○	○	○	○	○	○		○	○	○	○	◎	26
○	○	○	○	○	○	○		○	○	○	○	◎	27
○	○	○	○	○	○	○		○	○	○	○	◎	28
													29
													30
○	○	○	○	○	○	○							31
○	○	○	○	○	○	○							32
○	○	○	○	○	○	○							33
○	○	○	○	○	○	○							34
○	○	○	○	○	○	○							35
○	○	○	○	○	○	○	○						36
○	○	○	○	○	○	○	○						37
													38
													39
○	○	○	○	○	○	○	○	○	○			○	40
													41

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

YG

MILLING TOOLS

	ONLY ONE						
SERIES	GYG64	GYG67	GYG65	GYG66	GYG69	GYG68	GYG70
FLUTE	2	4	4	4	4&5	3~6	3~6
HELIX ANGLE	30°	30°	30°	M-Helix	M-Helix	30°	30°
CUTTING EDGE SHAPE	SQUARE	BALL NOSE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	ROUGHING	ROUGHING
SIZE MIN	D1/8	R1/16	D1/8	D1/8	D1/4	D1/4	D1/4
SIZE MAX	D1	R1/2	D1	D1	D1	D1-1/4	D1-1/4
PAGE	C796	C797	C798	C799	C780	C781	C782
LENGTH	CENTER CUT	-	CENTER CUT	CENTER CUT	FINE CENTER CUT	FINE CENTER CUT	COARSE CENTER CUT
SURFACE TREATMENT	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating
	PM60	PM60	PM60	PM60	PM60	PM60	PM60

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◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc							
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎
	5		300	32	○	○	○	○	○	○	○
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎
	8		300	32	○	○	○	○	○	○	○
	9		350	38	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎
	11		325	35	○	○	○	○	○	○	○
M	12	Stainless steel	200	15							
	13		240	23							
	14		180	10	◎	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	180	10	◎	◎	◎	◎	◎	◎	◎
	16		260	26	◎	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	160	3	◎	◎	◎	◎	◎	◎	◎
	18		250	25	◎	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	130		◎	◎	◎	◎	◎	◎	◎
	20		230	21	◎	◎	◎	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	60								
	22		100								
	23	Aluminum-cast, alloyed	75								
	24		90								
	25		130								
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○
	29	Non Metallic Materials									
	30										
S	31	Heat Resistant Super Alloys	200	15							
	32		280	30							
	33		250	25							
	34		350	38							
	35		320	34							
	36	Titanium Alloys	400 Rm								
	37		1050 Rm								
H	38	Hardened steel	550	55							
	39		630	60							
	40	Chilled Cast Iron	400	42	○	○	○	○	○	○	○
	41	Hardened Cast Iron	550	55							

SINE-POWER	TANK-POWER										
E2F64	E9983	E9984	E9985	E9986	E9988	E9992	E9990	E9991	E9A86	E9A87	E9921
4&6	2	2	4	4	3&4	2	3~6	3~6	3~6	3~6	5&6
35°	30°	30°	30°	30°	60°	30°	30°	30°	30°	30°	35°
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
D3/4	D1/8	D1/8	D1/8	D1/8	D1/4	R1/16	D1/4	D1/4	D5/16	D5/16	D1/2
D2	D1	D1	D1	D1	D1	R1/2	D1-1/4	D1-1/4	D1-1/4	D1-1/4	D1-1/4
C811	C816	C817	C818	C819	C820	C821	C822	C823	C824	C825	C826
-	REGULAR LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH FINE PITCH	REGULAR LENGTH COARSE PITCH	LONG LENGTH FINE PITCH	LONG LENGTH COARSE PITCH	EXTENDED NECK FINE PITCH CENTER CUTTING
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
HSS Co8	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM	HSS-PM
	U.S.A Stock										

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	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	7
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	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	11
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SELECTION GUIDE

MILLING TOOLS

	COBALT & HSS							
SERIES	E2030 E1030	E2080 E1080	E2033 E1033	E2050 E1050	E2110 E1110	E2111 E1111	E2112 E1112	E2031 E1031
FLUTE	2	2	2	2	2	2	2	4
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE
SIZE MIN	D1/8	D1/4	D1/8	D1/8	R1/16	R1/16	R1/16	D1/8
SIZE MAX	D2	D2	D1-1/4	D1	R1	R1/2	R1/2	D1
PAGE	C841	C843	C844	C845	C847	C848	C849	C850
LENGTH	REGULAR LENGTH	LONG LENGTH	EXTENDED LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH	EXTENDED LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS

Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	○	○	○	○	○	○	○	○
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	○	○	○	○	○	○	○	○
	9		350	38	○	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎
	11		325	35	○	○	○	○	○	○	○	○
M	12	Stainless steel	200	15								
	13		240	23								
	14		180	10								
K	15	Grey cast iron	180	10								
	16		260	26								
	17	Nodular cast iron	160	3								
	18		250	25								
	19	Malleable cast iron	130									
	20		230	21								
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○	○
	22		100		○	○	○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○	○
	24		90		○	○	○	○	○	○	○	○
	25		130		○	○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○	○
	29	Non Metallic Materials										
	30											
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm									
	37		1050 Rm									
H	38	Hardened steel	550	55								
	39		630	60								
	40	Chilled Cast Iron	400	42								
	41	Hardened Cast Iron	550	55								

	COBALT & HSS												
SERIES	E2032 E1032	E2034 E1034	E2035 E1035	E2036 E1036	E2037 E1037	E2051 E1051	E2031 E1031	E2032 E1032	E2020	E2021	E2069	E2039 E1039	E2042 E1042
FLUTE	6	4	6	4	6	4	4	6&8	4	4	4	4	6
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE	SQUARE
SIZE MIN	D5/8	D1/4	D1-1/8	D1/4	D1-1/4	D1/8	D3/4	D1-1/8	R1/16	R1/8	R1/16	D1/8	D1/2
SIZE MAX	D2	D1	D2	D1	D2	D1	D1	D2	R1	R1/2	R1/2	D1-1/2	D2
PAGE	C852	C853		C854		C855	C857		C858	C859	C860	C861	C863
LENGTH	REGULAR LENGTH	LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH 3/4 SHANK	REGULAR LENGTH 3/4 SHANK	REGULAR LENGTH	LONG LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH CENTER CUTTING	REGULAR LENGTH CENTER CUTTING
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8	HSS Co8	HSS Co8	HSS Co8 & HSS	HSS Co8 & HSS

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CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

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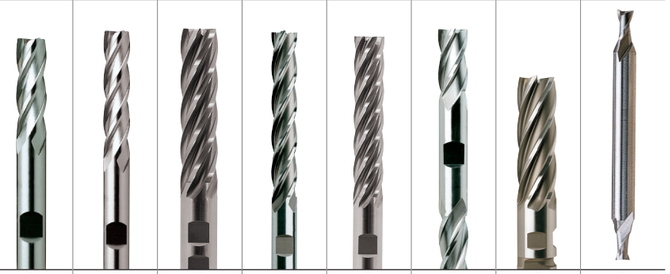
MILLING TOOLS

	COBALT & HSS							
SERIES	E2039 E2042	E2040 E1040	E2162 E1162	E2041 E1041	E2175 E1175	E2053 E1053	E2100 E1100	E2001 E1001
FLUTE	4~8	4	6	4	6	4	6	2
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°	30°&39°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D1	D1/4	D1/2	D1/4	D1/2	D1/8	D2	D1/32
SIZE MAX	D2	D1-1/2	D2	D1-1/4	D2	D1	D2	D3/16
PAGE	C864	C865		C866		C867	C869	C870
LENGTH	MEDIUM LENGTH CENTER CUTTING	LONG LENGTH CENTER CUTTING	LONG LENGTH CENTER CUTTING	EXTRA LONG LENGTH CENTER CUTTING	EXTRA LONG LENGTH CENTER CUTTING	REGULAR LENGTH DOUBLE CENTER CUTTING	REGULAR COMBINATION 2 SHANK CENTER CUTTING	STUB LENGTH MINIATURE DOUBLE
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS Co8	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS

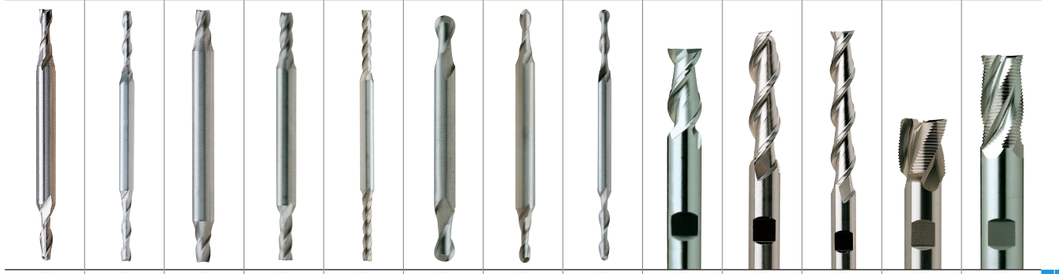


Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc								
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎
	5		300	32	○	○	○	○	○	○	○	○
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎
	8		300	32	○	○	○	○	○	○	○	○
	9		350	38	○	○	○	○	○	○	○	○
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎
	11		325	35	○	○	○	○	○	○	○	○
M	12	Stainless steel	200	15								○
	13		240	23								○
	14		180	10								○
K	15	Grey cast iron	180	10								
	16		260	26								
	17	Nodular cast iron	160	3								
	18		250	25								
	19	Malleable cast iron	130									
	20		230	21								
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○	○
	22		100		○	○	○	○	○	○	○	○
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○	○
	24		90		○	○	○	○	○	○	○	○
	25		130		○	○	○	○	○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○	○
	27		90		○	○	○	○	○	○	○	○
	28		100		○	○	○	○	○	○	○	○
	29	Non Metallic Materials										
	30											○
S	31	Heat Resistant Super Alloys	200	15								
	32		280	30								
	33		250	25								
	34		350	38								
	35		320	34								
	36	Titanium Alloys	400 Rm									○
	37		1050 Rm									○
H	38	Hardened steel	550	55								
	39		630	60								
	40	Chilled Cast Iron	400	42								
	41	Hardened Cast Iron	550	55								

	COBALT & HSS												
SERIES	E2003 E1003	E2005 E1005	E2002 E1002	E2004 E1004	E2006 E1006	E2008 E1008	E2013 E1013	E2015 E1015	E1070	E1071	E1072	E2086	E2085
FLUTE	2	2	4	4	4	2	2	2	2	2	2	4&5	3~5
HELIX ANGLE	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	42°	42°	42°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE	SQUARE	SQUARE	ROUGHING	ROUGHING
SIZE MIN	D1/32	D1/16	D1/16	D1/16	D1/16	R1/32	R1/64	R1/32	D1/4	D1/4	D1/4	D1/4	D1/4
SIZE MAX	D3/16	D3/16	D3/16	D3/16	D3/16	R3/32	R3/32	R3/32	D2	D2	D1-1/2	D1	D1
PAGE	C871	C872	C873	C874	C875	C876	C877	C878	C879	C880		C881	C882
LENGTH	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	STUB LENGTH MINIATURE DOUBLE	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	STUB LENGTH MINIATURE DOUBLE	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	REGULAR & MEDIUM LENGTH ALUMINUM	LONG LENGTH ALUMINUM	EXTRA LONG LENGTH ALUMINUM	STUB LENGTH FINE PITCH CENTER CUTTING	REGULAR LENGTH FINE PITCH CENTER CUTTING
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS	HSS	HSS	HSS Co8	HSS Co8



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24	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	
25	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	
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40														H
41														

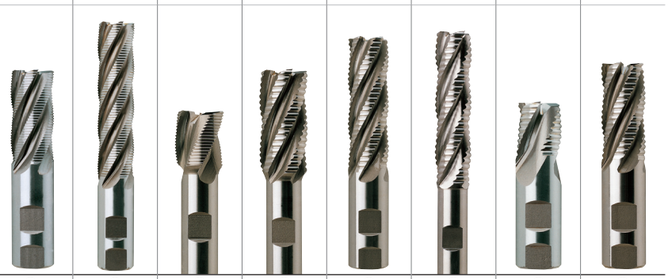
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

MILLING TOOLS

COBALT & HSS

SERIES	E2079	E2077	E2086	E2170	E2171	E2172	E2241	E2195
FLUTE	3~6	4~6	3	3~8	5~8	4~8	3	4~6
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
SIZE MIN	D1/4	D1/2	D1/4	D1/4	D1	D1/2	D1/4	D1/2
SIZE MAX	D2	D2	D1	D2	D2	D2	D1	D1-1/2
PAGE	C883	C884	C885	C886	C887	C888	C889	C890
LENGTH	REGULAR LENGTH FINE PITCH	LONG LENGTH FINE PITCH	STUB LENGTH FINE PITCH CENTER CUTTING	REGULAR LENGTH COARSE PITCH ROUGHING	MEDIUM LENGTH COARSE PITCH	LONG LENGTH COARSE PITCH	STUB LENGTH COARSE PITCH CENTER CUTTING	REGULAR LENGTH COARSE PITCH CENTER CUTTING
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8



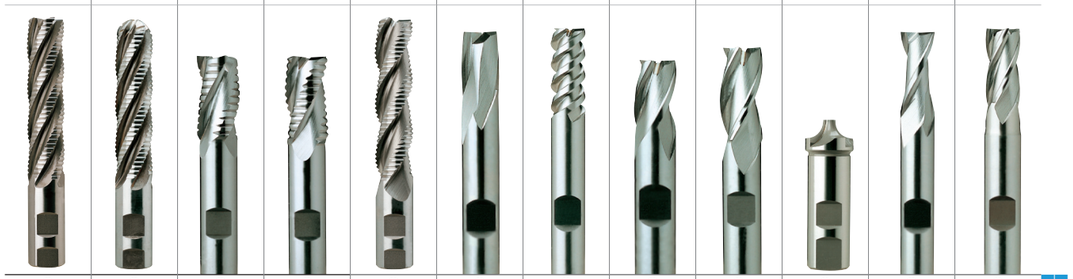
Please visit globalyg1.com/mat for material search

◎ : Excellent
○ : Good

ISO	VDI 3323	Material Description	HB	HRc	E2079	E2077	E2086	E2170	E2171	E2172	E2241	E2195	
P	1	Non-alloy steel	125		◎	◎	◎	◎	◎	◎	◎	◎	1
	2		190	13	◎	◎	◎	◎	◎	◎	◎	◎	2
	3		250	25	◎	◎	◎	◎	◎	◎	◎	◎	3
	4		270	28	◎	◎	◎	◎	◎	◎	◎	◎	4
	5		300	32	○	○	○	○	○	○	○	○	5
	6	Low alloy steel	180	10	◎	◎	◎	◎	◎	◎	◎	◎	6
	7		275	29	◎	◎	◎	◎	◎	◎	◎	◎	7
	8		300	32	○	○	○	○	○	○	○	○	8
	9		350	38	○	○	○	○	○	○	○	○	9
	10	High alloyed steel, and tool steel	200	15	◎	◎	◎	◎	◎	◎	◎	◎	10
	11		325	35	○	○	○	○	○	○	○	○	11
M	12	Stainless steel	200	15									12
	13		240	23									13
	14		180	10									14
K	15	Grey cast iron	180	10									15
	16		260	26									16
	17	Nodular cast iron	160	3									17
	18		250	25									18
	19	Malleable cast iron	130										19
	20		230	21									20
N	21	Aluminum-wrought alloy	60		○	○	○	○	○	○	○	○	21
	22		100		○	○	○	○	○	○	○	○	22
	23	Aluminum-cast, alloyed	75		○	○	○	○	○	○	○	○	23
	24		90		○	○	○	○	○	○	○	○	24
	25		130		○	○	○	○	○	○	○	○	25
	26	Copper and Copper Alloys (Bronze / Brass)	110		○	○	○	○	○	○	○	○	26
	27		90		○	○	○	○	○	○	○	○	27
	28		100		○	○	○	○	○	○	○	○	28
	29	Non Metallic Materials											29
	30												30
S	31	Heat Resistant Super Alloys	200	15									31
	32		280	30									32
	33		250	25									33
	34		350	38									34
	35		320	34									35
	36	Titanium Alloys	400 Rm										36
	37		1050 Rm										37
H	38	Hardened steel	550	55									38
	39		630	60									39
	40	Chilled Cast Iron	400	42									40
	41	Hardened Cast Iron	550	55									41

COBALT & HSS

SERIES	E2197	E2193 E2125	E2248	E2191	E2226 E2192	E2163 E1163	E2120 E2121	E2160	E2161	E2237 E1237	E2482 E1482	E2483 E1483
FLUTE	4~6	3~6	4~8	3	3	2	3&4	3	3	4	2	4
HELIX ANGLE	30°	30°	30°	37°	37°	15°	60°	30°	30°	0°	30°	30°
CUTTING EDGE SHAPE	ROUGHING	BALL NOSE ROUGHING	ROUGHING & FINISHING	ROUGHING	ROUGHING	SQUARE	SQUARE	SQUARE	SQUARE	CORNER ROUNDING	SQUARE	SQUARE
SIZE MIN	D1/2	R1/8	D1/4	D1/4	D1/2	D1/8	D1/4 D7/8	D1/16	D1/16	D1/4	D2.0 (.0787)	D2.0 (.0787)
SIZE MAX	D1-1/2	R3/4	D2	D1-1/2	D1-1/2	D1	D3/4 D2	D1/4	D1/4	D5/8	D45.0 (1.772)	D45.0 (1.772)
PAGE	C890	C891	C892	C893	C894	C895	C896	C897		C898	C899	C900
LENGTH	LONG LENGTH COARSE PITCH CENTER CUTTING	REGULAR & LONG LENGTH COARSE PITCH	ROUGHING & FINISHING CENTER CUTTING	REGULAR LENGTH ALUMINUM CENTER CUTTING	MEDIUM & LONG LENGTH ALUMINUM CENTER CUTTING	KEYWAY CUTTING	REGULAR LENGTH	SHORT LENGTH THROW AWAY	LONG LENGTH THROW AWAY	-	REGULAR LENGTH	REGULAR LENGTH
SURFACE TREATMENT	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8 & HSS	HSS Co8	HSS Co8	HSS Co8	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS



E2197	E2193 E2125	E2248	E2191	E2226 E2192	E2163 E1163	E2120 E2121	E2160	E2161	E2237 E1237	E2482 E1482	E2483 E1483	
◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	1
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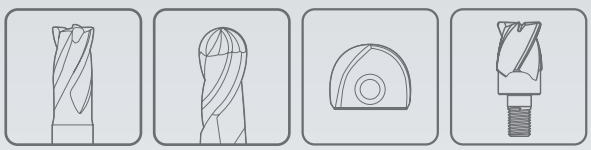
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

Global Cutting Tool Leader **YG-1**



MILLING

YG

Leading Through Innovation

CBN (Cubic Boron Nitride) END MILLS

- CBN(Cubic Boron Nitride) Machining
  High Hardened Steels up to HRc70 / Mirror Finish

SELECTION GUIDE

YG MILLING TOOLS

SERIES	ESB94	ESD02
FLUTE	2	2
HELIX ANGLE	30°	0°
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS
SIZE MIN	R0.2	D0.5
SIZE MAX	R1.5	D2.0
PAGE	C47	C48
	Uncoated	Uncoated

CBN END MILLS

CBN(Cubic Boron Nitride) Machining
High Hardened Steels up to HRc70 / Mirror Finish

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C49

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13		
	3		About 0.45% C	Quenched & Tempered	250	25		
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10		
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60			
	22		Curable	Hardened	100			
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75			
	24		≤ 12% Si, Curable	Hardened	90			
	25		> 12% Si, Not Curable		130			
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55	◎	◎
	39			Hardened	630	60	◎	◎
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55	◎	◎

YG CBN END MILLS

PLAIN SHANK **ESB94** SERIES

CBN, 2 FLUTE BALL NOSE

- Higher accuracy, better finishes, longer tool life.
- Special geometry improves tool rigidity at high Speed.
- Tighter radius tolerance (±0.005mm) assures higher accuracy.

CBN | 2 | 30° | R ±0.005 | PLAIN | UNCOATED

p.C49

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.005)	D1		D2	L1	L3	L2	D3
ESB94004012	R0.2	0.4	.0157	4	0.3	1.2	50	0.37
ESB94005015	R0.25	0.5	.0197	4	0.4	1.5	50	0.46
ESB94006015	R0.3	0.6	.0236	4	0.5	1.5	50	0.56
ESB94008020	R0.4	0.8	.0315	4	0.6	2	50	0.76
ESB94010025	R0.5	1.0	.0394	4	0.6	2.5	50	0.95
ESB94010040	R0.5	1.0	.0394	4	0.6	4	50	0.95
ESB94010060	R0.5	1.0	.0394	4	0.6	6	50	0.95
ESB94012030	R0.6	1.2	.0472	4	0.8	3	50	1.15
ESB94015030	R0.75	1.5	.0591	4	0.95	3	50	1.45
ESB94015040	R0.75	1.5	.0591	4	0.95	4	50	1.45
ESB94015060	R0.75	1.5	.0591	4	0.95	6	50	1.45
ESB94020050	R1.0	2.0	.0787	4	1.2	5	50	1.95
ESB94020060	R1.0	2.0	.0787	4	1.2	6	50	1.95
ESB94030060	R1.5	3.0	.1181	4	1.8	6	50	2.85

Radius Tolerance(mm)	Shank Dia. Tolerance
±0.005	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

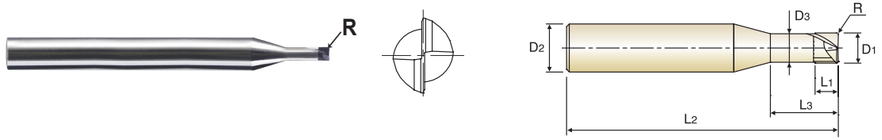
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎		◎

YG CBN END MILLS

PLAIN SHANK **ESD02** SERIES

CBN, 2 FLUTE CORNER RADIUS

- Higher accuracy, better finishes, longer tool life.
- Special geometry improves tool rigidity at high Speed.
- Tighter radius tolerance (±0.005mm) assures higher accuracy.



CBN | 2 | 0° | R ±0.005 | PLAIN | UNCOATED p.C49

Unit : mm

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.005)	D1		D2	L1	L3	L2	D3
ESD02005052	R0.05	0.5	.0197	4	0.3	2	50	0.46
ESD02005053	R0.05	0.5	.0197	4	0.3	3	50	0.46
ESD02010053	R0.05	1.0	.0394	4	0.7	3	50	0.95
ESD02010055	R0.05	1.0	.0394	4	0.7	5	50	0.95
ESD02010103	R0.1	1.0	.0394	4	0.7	3	50	0.95
ESD02010105	R0.1	1.0	.0394	4	0.7	5	50	0.95
ESD02015105	R0.1	1.5	.0591	4	1.0	5	50	1.45
ESD02015108	R0.1	1.5	.0591	4	1.0	8	50	1.45
ESD02015205	R0.2	1.5	.0591	4	1.0	5	50	1.45
ESD02015208	R0.2	1.5	.0591	4	1.0	8	50	1.45
ESD02020106	R0.1	2.0	.0787	4	1.2	6	50	1.95
ESD02020100	R0.1	2.0	.0787	4	1.2	10	50	1.95
ESD02020206	R0.2	2.0	.0787	4	1.2	6	50	1.95
ESD02020200	R0.2	2.0	.0787	4	1.2	10	50	1.95

Corner Radius Tolerance(mm)	Shank Dia. Tolerance
±0.005	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎		◎

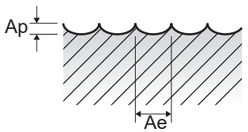
YG CBN END MILLS

RECOMMENDED CUTTING CONDITIONS

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

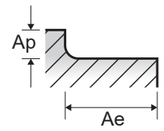
ESB94 SERIES 2 FLUTE BALL NOSE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						0.4	0.5	0.6	0.8	1.0	1.2	1.5	2.0	3.0
H	38.2-39.1	Hardened steel	Ø0.4~Ø0.8 = .0002" Ø1.0~Ø3.0 = .0004"	Ø0.4~Ø0.8 = .0002" Ø1.0~Ø3.0 = .0004"	SFM (Vc)	205	260	310	410	515	620	775	825	820
					IPT (fz)	.0005	.0006	.0008	.0008	.0012	.0012	.0012	.0016	.0016
					RPM	50000	50000	50000	50000	50000	50000	50000	40000	26500
					IPM (FEED)	47	59	79	79	118	118	118	126	83
	39.2-39.3		Ø0.4~Ø0.8 = .0002" Ø1.0~Ø3.0 = .0004"	Ø0.4~Ø0.8 = .0002" Ø1.0~Ø3.0 = .0004"	SFM (Vc)	205	260	310	410	515	620	775	660	665
					IPT (fz)	.0005	.0006	.0008	.0008	.0012	.0012	.0012	.0015	.0016
					RPM	50000	50000	50000	50000	50000	50000	50000	32000	21500
					IPM (FEED)	47	59	79	79	118	118	118	98	67
	41	Hardened Cast Iron	Ø0.4~Ø0.8 = .0002" Ø1.0~Ø3.0 = .0004"	Ø0.4~Ø0.8 = .0002" Ø1.0~Ø3.0 = .0004"	SFM (Vc)	205	260	310	410	515	620	775	825	820
					IPT (fz)	.0005	.0006	.0008	.0008	.0012	.0012	.0012	.0016	.0016
					RPM	50000	50000	50000	50000	50000	50000	50000	40000	26500
					IPM (FEED)	47	59	79	79	118	118	118	126	83



ESD02 SERIES 2 FLUTE CORNER RADIUS

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)			
						0.5	1.0	1.5	2.0
H	38.2-39.1	Hardened steel	Ø0.5 = .0039" Ø1.0 = .0079" Ø1.5 = .0158" Ø2.0 = .0236"	Ø0.5 =.0004" Ø1.0 = .0004" Ø1.5 = .0008" Ø2.0 = .0012"	SFM (Vc)	260	445	465	455
					IPT (fz)	.0003	.0005	.0007	.0008
					RPM	50000	43000	30000	22000
					IPM (FEED)	28	39	39	35
	39.2-39.3		Ø0.5 = .0024" Ø1.0 = .0039" Ø1.5 = .0079" Ø2.0 = .0118"	Ø0.5 = .0020" Ø1.0 = .0039" Ø1.5 = .0079" Ø2.0 = .0118"	SFM (Vc)	260	310	295	290
					IPT (fz)	.0002	.0005	.0007	.0011
					RPM	50000	30000	19000	14000
					IPM (FEED)	22	28	28	32
	41	Hardened Cast Iron	Ø0.5 = .0039" Ø1.0 = .0079" Ø1.5 = .0158" Ø2.0 = .0236"	Ø0.5 =.0004" Ø1.0 = .0004" Ø1.5 = .0008" Ø2.0 = .0012"	SFM (Vc)	205	260	310	410
					IPT (fz)	.0005	.0006	.0008	.0008
					RPM	50000	50000	50000	50000
					IPM (FEED)	47	59	79	79



Global Cutting Tool Leader **YG-1**

MILLING

Leading Through Innovation

CARBIDE INSERTS & HOLDERS

i-Xmill END MILLS

- Various Applications Type of Inserts Available for General Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steels and Graphite

SELECTION GUIDE

YG MILLING TOOLS

CARBIDE INSERTS & HOLDERS

i-Xmill END MILS

Various Applications Type of Inserts Available for General Steels, Pre-Hardened Steels, High Hardened Steels, Stainless Steels and Graphite

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C66

						Inch		
					SERIES	XB1A	XB2C	XB1D
					FLUTE	2	2	2
					HELIX ANGLE	-	-	-
					CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE
					SIZE MIN	R5/32	R5/32	R5/32
					SIZE MAX	R5/8	R5/8	R5/8
					PAGE	C54		
						for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE
						AlTiN	Z-Coating	Diamond
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎		
	2		About 0.45% C	Annealed	190	13	◎		
	3		About 0.45% C	Quenched & Tempered	250	25	◎		
	4		About 0.75% C	Annealed	270	28	◎		
	5		About 0.75% C	Quenched & Tempered	300	32	◎		
	6	Low alloy steel		Annealed	180	10	◎		
	7			Quenched & Tempered	275	29	◎		
	8			Quenched & Tempered	300	32	◎		
	9			Quenched & Tempered	350	38		◎	
	10	High alloyed steel, and tool steel		Annealed	200	15		○	
	11			Quenched & Tempered	325	35		○	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10			
K	15	Grey cast iron	Pearlitic / ferritic		180	10		◎	
	16		Pearlitic (Martensitic)		260	26		◎	
	17	Nodular cast iron	Ferritic		160	3		◎	
	18		Pearlitic		250	25		◎	
	19	Malleable cast iron	Ferritic		130			◎	
	20		Pearlitic		230	21		◎	
N	21	Aluminum-wrought alloy	Not Curable		60				○
	22		Curable	Hardened	100				○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				○
	24		≤ 12% Si, Curable	Hardened	90				○
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110				
	27		CuZn, CuSnZn (Brass)		90				
	28		CuSn, lead-free copper and electrolytic copper		100				
	29.2	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						◎
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55		○	
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

	Inch			Metric						Inch & Metric		
SERIES	XR1A	XR2A	XR1D	XB1N	XB2N	XBAD	XRAA	XRBA	XRAD	ZBT ZBS	ZBC	ZRT ZRS
FLUTE	2	2	2	2	2	2	2	2	2	-	-	-
HELIX ANGLE	-	-	-	-	-	-	-	-	-	-	-	-
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	D5/16	D5/16	D5/16	R4.0	R4.0	R4.0	D8.0	D8.0	D8.0	-	-	-
SIZE MAX	D1-1/4	D1-1/4	D1-1/4	R16.0	R16.0	R16.0	D32.0	D32.0	D32.0	-	-	-
PAGE	C57			C59			C62			in C55 / mm C60	in C56 / mm C61	in C58 / mm C64
	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	for GENERAL PURPOSE	for HARDENED STEEL	for GRAPHITE	STRAIGHT & TAPER NECK	STRAIGHT NECK	STRAIGHT & TAPER NECK
	AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond	AlTiN	Z-Coating	Diamond	Steel	Carbide	Steel
	◎			◎			◎						1 P
	◎			◎			◎						2
	◎			◎			◎						3
	◎			◎			◎						4
	◎			◎			◎						5
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	◎			◎			◎						8
		◎			◎			◎					9
		○			○			○					10
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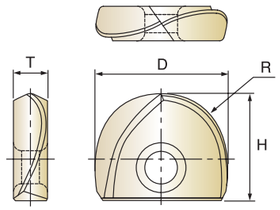
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG i-Xmill END MILLS

XB1A SERIES
XB2C SERIES
XB1D SERIES

i-Xmill BALL INSERTS

- Exchangeable End Mill for economic use
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite
- Special Geometry and extremely abrasive resistant Coating for Excellent Performance



cutting conditions : p.C66

Unit : Inch

EDP No. For General Purpose	EDP No. For Hardened Steel	EDP No. For Graphite	Radius of Ball Nose R	Mill Diameter D	Height H	Thickness T
XB1A020	XB2C020	XB1D020	R5/32	5/16	5/16	.094
XB1A024	XB2C024	XB1D024	R3/16	3/8	3/8	.106
XB1A032	XB2C032	XB1D032	R1/4	1/2	7/16	.126
XB1A040	XB2C040	XB1D040	R5/16	5/8	1/2	.165
XB1A048	XB2C048	XB1D048	R3/8	3/4	5/8	.205
XB1A100	XB2C100	XB1D100	R1/2	1	3/4	.244
XB1A116	XB2C116	XB1D116	R5/8	1-1/4	31/32	.283

- The ball radius tolerance is ±.0004″ and the set-up accuracy is ±.0008″

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XB1A	◎	◎	◎	◎	◎	◎	◎	◎												
XB2C									◎	○	○				◎	◎	◎	◎	◎	◎
XB1D																				

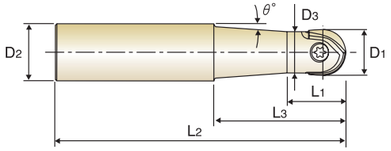
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
XB1A																					
XB2C																		○			
XB1D	○	○	○	○					◎												

YG i-Xmill END MILLS

ZBT SERIES
ZBS SERIES

i-Xmill BALL HOLDERS - STEEL

- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.

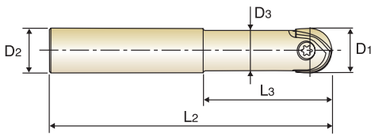


Taper neck Type

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Interference Angle θ°	Length Type	Wrench No.	Screw No.
ZBT1020	5/16	1/2	1/2	1-5/8	3-5/8	9/32	4° 33'	Short	TWF07	TX0807
ZBT2020			1	2-1/2	4-3/8		3° 25'	Regular		
ZBT1024	3/8	1/2	5/8	1-1/2	3-9/16	11/32	3° 49'	Short	TWF08	TX1008
ZBT2024			1-1/4	2-5/16	4-3/8		3° 08'	Regular		
ZBT1032	1/2	5/8	11/16	2-3/16	4-3/8	7/16	2° 49'	Short	TWF10	TX1210
ZBT1040	5/8	3/4	13/16	2-9/16	5	9/16	2° 25'	Short	TWF15	TX1615
ZBT1048	3/4	1	1	3-1/8	6	43/64	3° 53'	Short	●TWB20	TX2020
ZBT1100	1	1-1/4	1-1/4	3-9/16	7	29/32	3° 45'	Short	●TWB25	TX2525
ZBT1116	1-1/4	1-1/4	1-9/16	4-3/8	8	1-1/16	1° 30'	Short	●TWB30	TX3030

* ● Required to use T-HANDLE (TWH600)



Straight neck Type

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Length Type	Wrench No.	Screw No.
ZBS1032	1/2	1/2	1-3/8	3-1/2	7/16	Short	TWF10	TX1210
ZBS2032			2-3/16	4-3/8		Regular		
ZBS1040	5/8	5/8	1-3/8	3-3/4	9/16	Short	TWF15	TX1615
ZBS2040			2-9/16	5		Regular		
ZBS1048	3/4	3/4	1-9/16	4-3/8	43/64	Short	●TWB20	TX2020
ZBS2048			3	6		Regular		
ZBS1100	1	1	1-3/4	5	29/32	Short	●TWB25	TX2525
ZBS2100			3-9/16	6-3/4		Regular		
ZBS1116	1-1/4	1-1/4	2-1/4	5-1/2	1-1/16	Short	●TWB30	TX3030
ZBS2116			4-3/8	7-3/4		Regular		

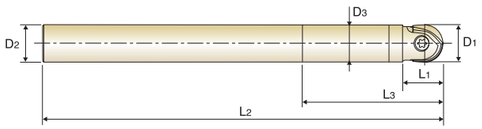
* ● Required to use T-HANDLE (TWH600)

YG i-Xmill END MILLS

ZBC SERIES

i-Xmill BALL HOLDERS - CARBIDE

- Equal tool rigidity like solid carbide end mill that makes the stable and high finishing machining with less vibration.
- The high finishing machining for the deeper part of mold.
- The tool's life of carbide ball holders is longer than steel holder.
- Shrink Fit Holding system can be applied.
- Upon request, the worn holder is able to be regenerated.



Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3			
ZBCB020	5/16	5/16	1/2	1-9/16	5-1/8	19/64	Long	TWF07	TX0807
ZBCB024	3/8	3/8	5/8	2	5-1/2	23/64	Long	TWF08	TX1008
ZBCB032	1/2	1/2	11/16	2-3/8	5-15/16	31/64	Long	TWF10	TX1210
ZBCB040	5/8	5/8	13/16	3-3/16	7-15/16	39/64	Long	TWF15	TX1615
ZBCD040					9-7/8				
ZBCB048	3/4	3/4	1	3-3/16	7-15/16	47/64	Long	●TWB20	TX2020
ZBCC048				4	9-7/8				
ZBCB100	1	1	1-3/16	4-3/4	9-7/8	63/64	Long	●TWB25	TX2525
ZBCB116	1-1/4	1-1/4	1-9/16	5-15/16	11-7/8	1-15/64	Long	●TWB30	TX3030

* ● Required to use T-HANDLE (TWH600)

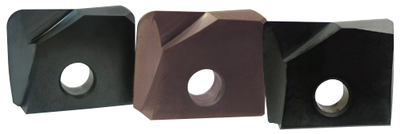
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

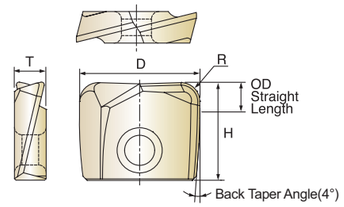
YG i-Xmill END MILLS

XR1A SERIES
XR2A SERIES
XR1D SERIES

i-Xmill CORNER RADIUS INSERTS

- The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- The various and wide cutting range makes it possible to machine over the roughing and finishing.
- Special coating makes high hardness with high thermal stability against oxidation.
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite





cutting conditions : p.C67

Unit :Inch

EDP No. For General Purpose	EDP No. For Hardened Steel	EDP No. For Graphite	Corner Radius	Mill Diameter	Height	Thickness	OD Straight Length
			R	D	H	T	
XR1A020 01	XR2A020 01	XR1D020 01	R1/64	5/16	5/16	.094	.079
XR1A020 02	XR2A020 02	XR1D020 02	R1/32				
XR1A024 01	XR2A024 01	XR1D024 01	R1/64	3/8	3/8	.106	.118
XR1A024 02	XR2A024 02	XR1D024 02	R1/32				
XR1A024 04	XR2A024 04	XR1D024 04	R1/16				
XR1A032 01	XR2A032 01	XR1D032 01	R1/64	1/2	7/16	.126	.118
XR1A032 02	XR2A032 02	XR1D032 02	R1/32				
XR1A032 04	XR2A032 04	XR1D032 04	R1/16				
XR1A040 01	XR2A040 01	XR1D040 01	R1/64	5/8	1/2	.165	.157
XR1A040 02	XR2A040 02	XR1D040 02	R1/32				
XR1A040 04	XR2A040 04	XR1D040 04	R1/16				
XR1A040 08	XR2A040 08	XR1D040 08	R1/8				
XR1A048 01	XR2A048 01	XR1D048 01	R1/64	3/4	5/8	.205	.157
XR1A048 02	XR2A048 02	XR1D048 02	R1/32				
XR1A048 04	XR2A048 04	XR1D048 04	R1/16				
XR1A048 08	XR2A048 08	XR1D048 08	R1/8				
XR1A100 01	XR2A100 01	XR1D100 01	R1/64	1	3/4	.244	.157
XR1A100 02	XR2A100 02	XR1D100 02	R1/32				
XR1A100 04	XR2A100 04	XR1D100 04	R1/16				
XR1A100 08	XR2A100 08	XR1D100 08	R1/8				
XR1A116 01	XR2A116 01	XR1D116 01	R1/64	1-1/4	29/32	.283	.157
XR1A116 02	XR2A116 02	XR1D116 02	R1/32				
XR1A116 04	XR2A116 04	XR1D116 04	R1/16				
XR1A116 08	XR2A116 08	XR1D116 08	R1/8				

- The other corner radius values are available on request.
- The corner radius tolerance is ±.0006″ and the set-up accuracy is ±.0008″

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XR1A	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XR2A									◎	○	○				◎	◎	◎	◎	◎	◎
XR1D																				

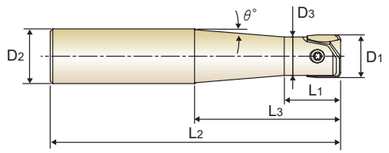
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
XR1A																					
XR2A																		○			
XR1D	○	○	○	○					◎												

i-Xmill END MILLS

ZRT SERIES
ZRS SERIES

i-Xmill CORNER RADIUS HOLDERS - STEEL

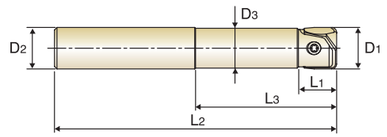
- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.



Taper neck Type

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3	θ°			
ZRT1032	5/16	1/2	13/32	7/8	4	17/64	13° 58'	Regular	TWF07	TX0807
ZRT2032				2	5-1/8		4° 12'	Long		
ZRT2410	3/8	1/2	17/32	1	4	5/16	9° 27'	Regular	TWF08	TX1008
ZRT2420				2	5-15/16		3° 6'	Long		
ZRT3220	1/2	5/8	5/8	2-3/8	6-5/16	27/64	3° 19'	Long	TWF10	TX1210



Straight neck Type

Unit :Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Length Type	Wrench No.	Screw No.
	D1	D2	L1	L3	L2	D3			
ZRS1032	1/2	1/2	17/32	1-3/16	4-3/8	7/16	Regular	TWF10	TX1210
ZRS1040	5/8	5/8	5/8	2	5-1/8	19/32	Regular	TWF15	TX1615
ZRS2040				2-9/16	6-1/2		Intermediate		
ZRS1048	3/4	3/4	23/32	2-3/8	5-1/2	23/32	Regular	●TWB20	TX2020
ZRS2048				3-1/8	7-1/8		Intermediate		
ZRS1100	1	1	29/32	2-3/4	5-15/16	31/32	Regular	●TWB25	TX2525
ZRS2100				3-9/16	8		Intermediate		
ZRS1116	1-1/4	1-1/4	1-1/8	3-1/8	6-5/16	1-7/32	Regular	●TWB30	TX3030
ZRS2116				4	8-11/16		Intermediate		

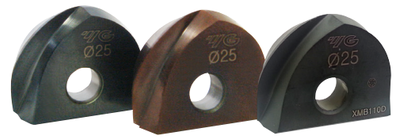
* ● Required to use T-HANDLE (TWH600)

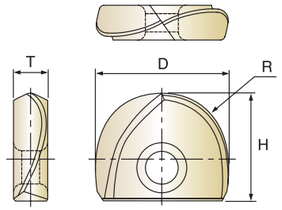
i-Xmill END MILLS

XB1N SERIES
XB2N SERIES
XBAD SERIES

i-Xmill BALL INSERTS

- Indexable Ball End Mill for economic use
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite
- Special Geometry and extremely abrasive resistant Coating for Excellent Performance





cutting conditions : p.C66

Unit : mm

EDP No. For General Purpose	EDP No. For Hardened Steel	EDP No. For Graphite	Radius of Ball Nose	Mill Diameter	Height	Thickness
			R	D	H	T
XB1N080	XB2N080	XBAD080	R4.0	8.0	8	2.4
XB1N100	XB2N100	XBAD100	R5.0	10.0	9.5	2.7
XB1N120	XB2N120	XBAD120	R6.0	12.0	11	3.2
XB1N160	XB2N160	XBAD160	R8.0	16.0	13	4.2
XB1N200	XB2N200	XBAD200	R10.0	20.0	16	5.2
XB1N250	XB2N250	XBAD250	R12.5	25.0	19.5	6.2
XB1N300	XB2N300	XBAD300	R15.0	30.0	23.5	7.2
XB1N320	XB2N320	XBAD320	R16.0	32.0	24.5	7.2

• The ball radius tolerance is ±0.01mm and the set-up accuracy is ±0.02mm

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XB1N	◎	◎	◎	◎	◎	◎	◎	◎												
XB2N									◎	○	○				◎	◎	◎	◎	◎	◎
XBAD																				

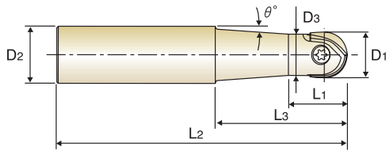
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400Rm	1050Rm	550	630	400	550
XB1N																					
XB2N																		○			
XBAD	○	○	○	○					◎												

YG i-Xmill END MILLS

ZBT SERIES
ZBS SERIES

i-Xmill BALL HOLDERS - STEEL

- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.

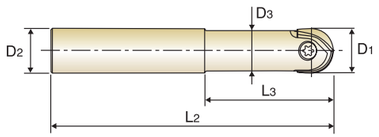


Taper neck Type

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Interference Angle θ°	Length Type	Wrench No.	Screw No.
ZBT0801	8.0	12	12	35	90	7.2	4° 43′	Short	TWF07	TX0807
ZBT0802			25	55	110		3° 37′	Regular		
ZBT1001	10.0	12	15	35	90	9	2° 51′	Short	TWF08	TX1008
ZBT1002			30	55	110		2° 17′	Regular		
ZBT1201	12.0	16	17	55	110	10.5	3° 23′	Short	TWF10	TX1210
ZBT1601	16.0	20	20	65	125	14.5	2° 51′	Short	TWF15	TX1615
ZBT2001	20.0	25	25	75	145	18	3° 26′	Short	●TWB20	TX2020
ZBT2501	25.0	32	30	90	170	22.5	4° 03′	Short	●TWB25	TX2525
ZBT3001	30.0	32	40	110	195	27	1° 38′	Short	●TWB30	TX3030
	32.0									

* ● Required to use T-HANDLE (TWH600)



Straight neck Type

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Length Type	Wrench No.	Screw No.
ZBS1201	12.0	12	35	90	0.5	Short	TWF10	TX1210
ZBS1202			55	110		Regular		
ZBS1601	16.0	16	35	95	14.5	Short	TWF15	TX1615
ZBS1602			65	125		Regular		
ZBS2001	20.0	20	40	110	18	Short	●TWB20	TX2020
ZBS2002			75	145		Regular		
ZBS2501	25.0	25	45	125	22.5	Short	●TWB25	TX2525
ZBS2502			90	170		Regular		
ZBS3001	30.0	32	55	140	27	Short	●TWB30	TX3030
ZBS3002	32.0		110	195		Regular		

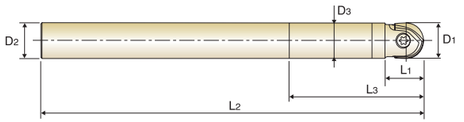
* ● Required to use T-HANDLE (TWH600)

YG i-Xmill END MILLS

ZBC SERIES

i-Xmill BALL HOLDERS - CARBIDE

- Equal tool rigidity like solid carbide end mill that makes the stable and high finishing machining with less vibration.
- The high finishing machining for the deeper part of mold.
- The tool's life of carbide ball holders is longer than steel holder.
- Shrink Fit Holding system can be applied.
- Upon request, the worn holder is able to be regenerated.



Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Length Type	Wrench No.	Screw No.
ZBC1080	8.0	8	12	12	130	7.7	Long	TWF07	TX0807
ZBC1100	10.0	10	15	15	140	9.7	Long	TWF08	TX1008
ZBC1120	12.0	12	17	17	150	11.7	Long	TWF10	TX1210
ZBC1160	16.0	16	20	20	200	15.7	Long	TWF15	TX1615
ZBC1200	20.0	20	25	25	200	19.7	Long	●TWB20	TX2020
ZBC1250	25.0	25	30	30	200	24.7	Long	●TWB25	TX2525
ZBC1320	30.0	32	40	40	250	29.7	Long	●TWB30	TX3030
	32.0								

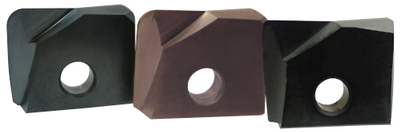
* ● Required to use T-HANDLE (TWH600)

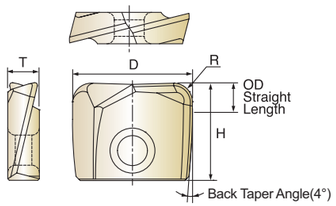
i-Xmill END MILLS

XRAA SERIES
XRBA SERIES
XRAD SERIES

i-Xmill CORNER RADIUS INSERTS

- The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- The various and wide cutting range makes it possible to machine over the roughing and finishing.
- Special coating makes high hardness with high thermal stability against oxidation.
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite





cutting conditions : p.C67

Unit : mm

EDP No. For General Purpose	EDP No. For Hardened Steel	EDP No. For Graphite	Corner Radius R	Mill Diameter D	Height H	Thickness T	OD Straight Length
XRAA080 03	XRBA080 03	XRAD080 03	R0.3	8.0	8	2.4	2
XRAA080 05	XRBA080 05	XRAD080 05	R0.5				
XRAA080 10	XRBA080 10	XRAD080 10	R1.0				
XRAA100 05	XRBA100 05	XRAD100 05	R0.5	10.0	9.5	2.7	3
XRAA100 10	XRBA100 10	XRAD100 10	R1.0				
XRAA100 20	XRBA100 20	XRAD100 20	R2.0				
XRAA120 05	XRBA120 05	XRAD120 05	R0.5	12.0	11	3.2	3
XRAA120 10	XRBA120 10	XRAD120 10	R1.0				
XRAA120 20	XRBA120 20	XRAD120 20	R2.0				
XRAA130 05	XRBA130 05	XRAD130 05	R0.5	13.0	11.2	3.2	3
XRAA130 10	XRBA130 10	XRAD130 10	R1.0				
XRAA130 20	XRBA130 20	XRAD130 20	R2.0				
XRAA160 05	XRBA160 05	XRAD160 05	R0.5	16.0	13	4.2	4
XRAA160 10	XRBA160 10	XRAD160 10	R1.0				
XRAA160 20	XRBA160 20	XRAD160 20	R2.0				
XRAA170 05	XRBA170 05	XRAD170 05	R0.5	17.0	13	4.2	4
XRAA170 10	XRBA170 10	XRAD170 10	R1.0				
XRAA170 20	XRBA170 20	XRAD170 20	R2.0				

- The other corner radius values are available on request.
- The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XRAA	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XRBA									◎	○	○				◎	◎	◎	◎	◎	◎
XRAD																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400㎫	1050㎫	550	630	400	550
XRAA																					
XRBA																		○			
XRAD	○	○	○	○					◎												

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

i-Xmill END MILLS

XRAA SERIES
XRBA SERIES
XRAD SERIES

i-Xmill CORNER RADIUS INSERTS

- The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
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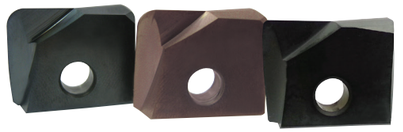
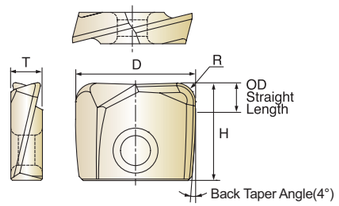
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Mat erial (HRc40~HRc65)
  - For Graphite





cutting conditions : p.C67

Unit : mm

EDP No. For General Purpose	EDP No. For Hardened Steel	EDP No. For Graphite	Corner Radius R	Mill Diameter D	Height H	Thickness T	OD Straight Length
XRAA200 05	XRBA200 05	XRAD200 05	R0.5	20.0	16	5.2	4
XRAA200 10	XRBA200 10	XRAD200 10	R1.0				
XRAA200 20	XRBA200 20	XRAD200 20	R2.0				
XRAA210 05	XRBA210 05	XRAD210 05	R0.5	21.0	16	5.2	4
XRAA210 10	XRBA210 10	XRAD210 10	R1.0				
XRAA210 20	XRBA210 20	XRAD210 20	R2.0				
XRAA250 05	XRBA250 05	XRAD250 05	R0.5	25.0	19.5	6.2	4
XRAA250 10	XRBA250 10	XRAD250 10	R1.0				
XRAA250 20	XRBA250 20	XRAD250 20	R2.0				
XRAA260 05	XRBA260 05	XRAD260 05	R0.5	26.0	19.5	6.2	4
XRAA260 10	XRBA260 10	XRAD260 10	R1.0				
XRAA260 20	XRBA260 20	XRAD260 20	R2.0				
XRAA300 05	XRBA300 05	XRAD300 05	R0.5	30.0	23.5	7.2	4
XRAA300 10	XRBA300 10	XRAD300 10	R1.0				
XRAA300 20	XRBA300 20	XRAD300 20	R2.0				
XRAA320 05	XRBA320 05	XRAD320 05	R0.5	32.0	23.5	7.2	4
XRAA320 10	XRBA320 10	XRAD320 10	R1.0				
XRAA320 20	XRBA320 20	XRAD320 20	R2.0				

- The other corner radius values are available on request.
- The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
XRAA	◎	◎	◎	◎	◎	◎	◎	◎				◎	◎	◎						
XRBA									◎	○	○				◎	◎	◎	◎	◎	◎
XRAD																				

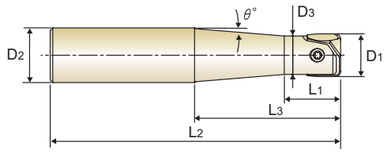
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400㎫	1050㎫	550	630	400	550
XRAA																					
XRBA																		○			
XRAD	○	○	○	○					◎												

i-Xmill END MILLS

ZRT SERIES
ZRS SERIES

i-Xmill CORNER RADIUS HOLDERS - STEEL

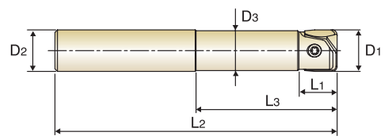
- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.



Taper neck Type

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Interference Angle θ°	Length Type	Wrench No.	Screw No.
ZRT8011	8.0	12	10	22	100	6.7	9°	Regular	TWF07	TX0807
ZRT8021				50	130		2° 43′	Long		
ZRT1001	10.0	12	13	25	100	8.6	4° 45′	Regular	TWF08	TX1008
ZRT1002				50	150		1° 32′	Long		
ZRT1202	12.0	16	15	60	160	10.2	2° 32′	Long	TWF10	TX1210
	13.0									



Straight neck Type

Unit : mm

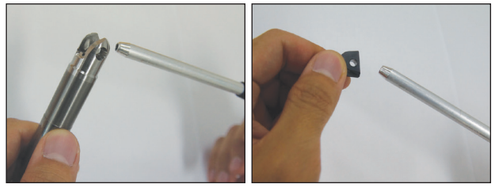
EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Length Type	Wrench No.	Screw No.
ZRS1120	12.0	12	13	30	110	11	Regular	TWF10	TX1210
	13.0								
ZRS1160	16.0	16	15	50	130	15	Regular	TWF15	TX1615
ZRS2160	17.0			65	165		Intermediate		
ZRS1200	20.0	20	18	60	140	19	Regular	●TWB20	TX2020
ZRS2200	21.0			80	180		Intermediate		
ZRS1250	25.0	25	23	70	150	24	Regular	●TWB25	TX2525
ZRS2250	26.0			90	200		Intermediate		
ZRS1300	30.0	32	27	80	160	29	Regular	●TWB30	TX3030
ZRS2300				100	220		Intermediate		
ZRS1320	32.0	32	28	80	160	31	Regular	●TWB30	TX3030
ZRS2320				100	220		Intermediate		

* ● Required to use T-HANDLE (TWH600)

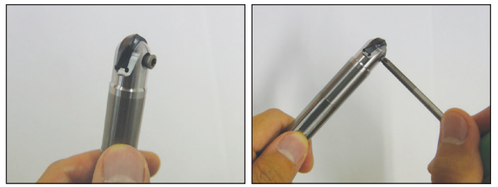
i-Xmill END MILLS

RECOMMENDED CUTTING CONDITIONS

Assembly of i-Xmill



◀ Make sure to clean the insert and insert seat.



◀ Slide the insert into the slot of the holder.
Tighten the screw using anti-seize compound.

SIZE ØD		CLAMPING TORQUE [in • lbs]
Ø5/16	(Ø8)	9.0
Ø3/8	(Ø10)	13.5
Ø1/2	(Ø12~Ø13)	22.5
Ø5/8	(Ø16~Ø17)	31.5
Ø3/4	(Ø20~Ø21)	44.5
Ø1	(Ø25~Ø26)	53.0
Ø1-1/4	(Ø30~Ø32)	58.0

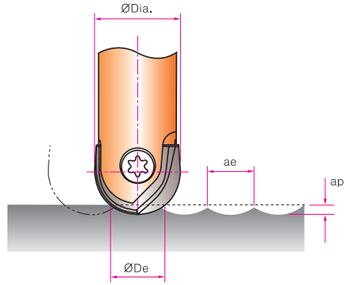
* When the screw is worn out, please change the new screw.
* Please tighten up the screw with recommended torque. (Please refer to the table)
* Don't press down the insert, when the screw is tightened.

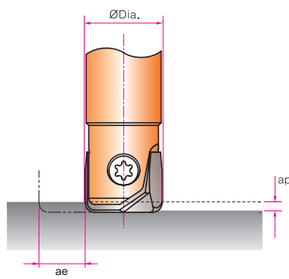
Wrench No.

WRENCH TYPE		PRODUCT No.	T-HANDLE No.
WING TYPE		TWFT10	–
		TWFT15	–
TORX BIT TYPE		● TWBT20	TWH600
		● TWBT25	
		● TWBT30	

* ● Required to use T-HANDLE (TWH600)

CUTTING CONDITION





RPM = revolution per minute (rev./min.)
SFM = surface feet per minute (ft/min.)
Dia. = diameter of insert (inch)
IPR = feed rate (inch/rev.)
IPM = inch per minute penetration rate
De = effective tool diameter (inch)
ap = axial depth of cut (inch)
ae = radial depth of cut (inch)

$$\text{SFM [ft/min.]} = \frac{(\text{RPM}) \cdot (\pi) \cdot (\text{Dia.})}{12}$$

$$\text{RPM [rev./min.]} = \frac{(\text{SFM}) \cdot (12)}{(\pi) \cdot (\text{Dia.})}$$

$$\text{IPM [inch/min.]} = (\text{RPM}) \cdot (\text{IPR})$$

$$\text{De [inch]} = 2\sqrt{(\text{ap}) \cdot (\text{Dia.} - \text{ap})}$$

i-Xmill END MILLS — RECOMMENDED CUTTING CONDITIONS

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

XB1A, XB1N SERIES — BALL INSERTS for GENERAL PURPOSE

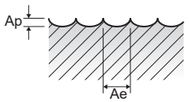
ISO	VDI 3323	Material Description	Parameter	O.D SIZE (Ø) 5/16 (8)	3/8 (10)	1/2 (12, 13)	5/8 (16, 17)	3/4 (20, 21)	1 (25, 26)	1-1/4 (30, 32)
				Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing
P	1-4	Non-alloy steel	SFM(Vc)	525~1050	525~1181	525~1247	525~1575	525~1903	525~1969	525~2297
			IPT(fz)	.008~.008	.008~.008	.008~.008	.010~.012	.010~.016	.010~.020	.010~.024
			RPM	6370~12730	5090~11460	4240~10080	3180~9550	2550~9230	2040~7640	1700~7430
			IPM(FEED)	100~200	80~180	70~160	60~230	50~290	40~300	30~350
	5		SFM(Vc)	394~919	394~984	394~1148	394~1247	394~1378	394~1575	394~1804
			IPT(fz)	.008~.008	.008~.008	.008~.008	.010~.012	.010~.016	.010~.020	.010~.024
			RPM	4770~11140	3820~9550	3180~9280	2390~7560	1910~6680	1530~6110	1270~5840
			IPM(FEED)	80~180	60~150	50~150	50~180	40~210	30~240	30~280
	6-7	Low alloy steel	SFM(Vc)	525~1050	525~1181	525~1247	525~1575	525~1903	525~1969	525~2297
			IPT(fz)	.008~.008	.008~.008	.008~.008	.010~.012	.010~.016	.010~.020	.010~.024
			RPM	6370~12730	5090~11460	4240~10080	3180~9550	2550~9230	2040~7640	1700~7430
			IPM(FEED)	100~200	80~180	70~160	60~230	50~290	40~300	30~350
	8		SFM(Vc)	394~919	394~984	394~1148	394~1247	394~1378	394~1575	394~1804
			IPT(fz)	.008~.008	.008~.008	.008~.008	.010~.012	.010~.016	.010~.020	.010~.024
			RPM	4770~11140	3820~9550	3180~9280	2390~7560	1910~6680	1530~6110	1270~5840
			IPM(FEED)	80~180	60~150	50~150	50~180	40~210	30~240	30~280

XB2C, XB2N SERIES — BALL INSERTS for HARDENED STEEL

ISO	VDI 3323	Material Description	Parameter	O.D SIZE (Ø) 5/16 (8)	3/8 (10)	1/2 (12, 13)	5/8 (16, 17)	3/4 (20, 21)	1 (25, 26)	1-1/4 (30, 32)
				Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing
P	9	Low alloy steel	SFM(Vc)	328~722	328~853	328~919	328~1148	328~1312	328~1476	328~1640
			IPT(fz)	.006~.008	.006~.008	.006~.008	.008~.012	.008~.016	.008~.020	.008~.024
			RPM	3980~8750	3180~8280	2650~7430	1990~6960	1590~6370	1270~5730	1060~5310
			IPM(FEED)	50~140	40~130	30~120	30~160	30~200	20~230	20~250
	10-11	High alloyed steel, and tool steel	SFM(Vc)	328~722	328~853	328~919	328~1148	328~1312	328~1476	328~1640
			IPT(fz)	.006~.008	.006~.008	.006~.008	.008~.012	.008~.016	.008~.020	.008~.024
			RPM	3980~8750	3180~8280	2650~7430	1990~6960	1590~6370	1270~5730	1060~5310
			IPM(FEED)	50~140	40~130	30~120	30~160	30~200	20~230	20~250
K	15-16	Grey cast iron	SFM(Vc)	525~1050	525~1181	525~1312	525~1640	525~1804	525~2034	525~2362
			IPT(fz)	.012~.012	.012~.012	.012~.012	.014~.016	.014~.016	.014~.020	.014~.024
			RPM	6370~12730	5090~11460	4240~10610	3180~9950	2550~8750	2040~7890	1700~7640
			IPM(FEED)	150~300	120~270	100~250	90~310	70~280	60~310	50~360
	17-18	Nodular cast iron	SFM(Vc)	525~1050	525~1181	525~1312	525~1640	525~1804	525~2034	525~2362
			IPT(fz)	.012~.012	.012~.012	.012~.012	.014~.016	.014~.016	.014~.020	.014~.024
			RPM	6370~12730	5090~11460	4240~10610	3180~9950	2550~8750	2040~7890	1700~7640
			IPM(FEED)	150~300	120~270	100~250	90~310	70~280	60~310	50~360
	19-20	Malleable cast iron	SFM(Vc)	525~1050	525~1181	525~1312	525~1640	525~1804	525~2034	525~2362
			IPT(fz)	.012~.012	.012~.012	.012~.012	.014~.016	.014~.016	.014~.020	.014~.024
			RPM	6370~12730	5090~11460	4240~10610	3180~9950	2550~8750	2040~7890	1700~7640
			IPM(FEED)	150~300	120~270	100~250	90~310	70~280	60~310	50~360
H	38	Hardened steel	SFM(Vc)	262~591	262~656	262~722	262~853	262~1050	262~1181	262~1312
			IPT(fz)	.004~.008	.004~.008	.004~.008	.006~.012	.006~.016	.006~.020	.006~.024
			RPM	3180~7160	2550~6370	2120~5840	1590~5170	1270~5090	1020~4580	850~4240
			IPM(FEED)	30~110	20~100	20~90	20~120	20~160	10~180	10~200

XB1D, XBAD SERIES — BALL INSERTS for GRAPHITE

ISO	VDI 3323	Material Description	Parameter	O.D SIZE (Ø) 5/16 (8)	3/8 (10)	1/2 (12, 13)	5/8 (16, 17)	3/4 (20, 21)	1 (25, 26)	1-1/4 (30, 32)
				Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing
N	21~22	Aluminum-wrought alloy	SFM(Vc)	984~1312	984~1312	984~1312	984~1312	984~1575	984~1837	984~2133
			IPT(fz)	.008~.008	.008~.008	.008~.008	.010~.012	.012~.014	.014~.016	.016~.020
			RPM	11940~15920	9550~12730	7960~10610	5970~7960	4770~7640	3820~7130	3180~6900
			IPM(FEED)	190~250	150~200	130~170	120~190	110~210	110~220	100~270
	23~24	Aluminum-cast, alloyed	SFM(Vc)	984~1312	984~1312	984~1312	984~1312	984~1575	984~1837	984~2133
			IPT(fz)	.008~.008	.008~.008	.008~.008	.010~.012	.012~.014	.014~.016	.016~.020
			RPM	11940~15920	9550~12730	7960~10610	5970~7960	4770~7640	3820~7130	3180~6900
			IPM(FEED)	190~250	150~200	130~170	120~190	110~210	110~220	100~270
	29.2	Graphite	SFM(Vc)	984~1312	984~1312	984~1312	984~1312	984~1575	984~1837	984~2133
			IPT(fz)	.008~.008	.008~.008	.008~.008	.010~.012	.012~.014	.014~.016	.016~.020
			RPM	11940~15920	9550~12730	7960~10610	5970~7960	4770~7640	3820~7130	3180~6900
			IPM(FEED)	190~250	150~200	130~170	120~190	110~210	110~220	100~270



ae : Roughing - 0.1 x D
Finishing - Under Ø1/2 : .01"
Under Ø3/4 : .012"
From Ø3/4 : .016"

ap : Roughing - Under Ø5/8 : 0.025 x D
From Ø5/8 : 0.05 x D
Finishing - .004"

▶ When the length of overhang exceeds 4xD, we recommend using the carbide shank holder with 20% lower feed
▶ When using long (long & intermediate type holder) tools, we recommend reducing the feed rate to 70 ~ 85%.

i-Xmill END MILLS — RECOMMENDED CUTTING CONDITIONS

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

XR1A, XRAA SERIES — CORNER RADIUS INSERTS for GENERAL PURPOSE

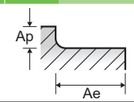
ISO	VDI 3323	Material Description	Parameter	O.D SIZE (Ø) 5/16 (8)	3/8 (10)	1/2 (12, 13)	5/8 (16, 17)	3/4 (20, 21)	1 (25, 26)	1-1/4 (30, 32)
				Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing
P	1-4	Non-alloy steel	SFM(Vc)	525~984	525~984	525~984	525~984	525~984	525~984	525~984
			IPT(fz)	.008~.006	.008~.006	.008~.006	.010~.008	.010~.008	.010~.008	.010~.008
			RPM	6370~11940	5090~9550	4240~7960	3180~5970	2550~4770	2040~3820	1700~3180
			IPM(FEED)	100~140	80~110	70~90	60~90	50~80	40~60	30~50
	5		SFM(Vc)	394~919	394~919	394~919	394~919	394~919	394~919	394~919
			IPT(fz)	.008~.006	.008~.006	.008~.006	.010~.008	.010~.008	.010~.008	.010~.008
			RPM	4770~11140	3820~8910	3180~7430	2390~5570	1910~4460	1530~3570	1270~2970
			IPM(FEED)	80~130	60~110	50~90	50~90	40~70	30~60	30~50
	6-7	Low alloy steel	SFM(Vc)	525~984	525~984	525~984	525~984	525~984	525~984	525~984
			IPT(fz)	.008~.006	.008~.006	.008~.006	.010~.008	.010~.008	.010~.008	.010~.008
			RPM	6370~11940	5090~9550	4240~7960	3180~5970	2550~4770	2040~3820	1700~3180
			IPM(FEED)	100~140	80~110	70~90	60~90	50~80	40~60	30~50
	8		SFM(Vc)	394~919	394~919	394~919	394~919	394~919	394~919	394~919
			IPT(fz)	.008~.006	.008~.006	.008~.006	.010~.008	.010~.008	.010~.008	.010~.008
			RPM	4770~11140	3820~8910	3180~7430	2390~5570	1910~4460	1530~3570	1270~2970
			IPM(FEED)	80~130	60~110	50~90	50~90	40~70	30~60	30~50
M	12-14	Stainless steel	SFM(Vc)	295~427	295~427	295~427	295~427	295~427	295~427	295~427
			IPT(fz)	.004~.004	.004~.004	.005~.004	.005~.005	.005~.005	.005~.005	.005~.005
			RPM	3580~5170	2860~4140	2390~3450	1790~2590	1430~2070	1150~1660	950~1380
			IPM(FEED)	30~40	20~40	20~30	20~30	10~20	10~20	10~10

XR2A, XRBA SERIES — CORNER RADIUS INSERTS for HARDENED STEEL

ISO	VDI 3323	Material Description	Parameter	O.D SIZE (Ø) 5/16 (8)	3/8 (10)	1/2 (12, 13)	5/8 (16, 17)	3/4 (20, 21)	1 (25, 26)	1-1/4 (30, 32)
				Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing
P	9	Low alloy steel	SFM(Vc)	328~919	328~919	328~919	328~919	328~919	328~919	328~919
			IPT(fz)	.005~.002	.005~.002	.005~.002	.006~.003	.006~.003	.006~.003	.006~.003
			RPM	3980~11140	3180~8910	2650~7430	1990~5570	1590~4460	1270~3570	1060~2970
			IPM(FEED)	40~50	30~40	30~40	20~40	20~30	20~20	10~20
	10-11	High alloyed steel, and tool steel	SFM(Vc)	328~919	328~919	328~919	328~919	328~919	328~919	328~919
			IPT(fz)	.005~.002	.005~.002	.005~.002	.006~.003	.006~.003	.006~.003	.006~.003
			RPM	3980~11140	3180~8910	2650~7430	1990~5570	1590~4460	1270~3570	1060~2970
			IPM(FEED)	40~50	30~40	30~40	20~40	20~30	20~20	10~20
K	15-16	Grey cast iron	SFM(Vc)	525~1247	525~1247	525~1247	525~1247	525~1247	525~1247	525~1247
			IPT(fz)	.012~.008	.012~.008	.012~.008	.014~.012	.014~.012	.014~.012	.014~.012
			RPM	6370~15120	5090~12100	4240~10080	3180~7560	2550~6050	2040~4840	1700~4030
			IPM(FEED)	150~240	120~190	100~160	90~180	70~140	60~110	50~100
	17-18	Nodular cast iron	SFM(Vc)	525~1247	525~1247	525~1247	525~1247	525~1247	525~1247	525~1247
			IPT(fz)	.012~.008	.012~.008	.012~.008	.014~.012	.014~.012	.014~.012	.014~.012
			RPM	6370~15120	5090~12100	4240~10080	3180~7560	2550~6050	2040~4840	1700~4030
			IPM(FEED)	150~240	120~190	100~160	90~180	70~140	60~110	50~100
	19-20	Malleable cast iron	SFM(Vc)	525~1247	525~1247	525~1247	525~1247	525~1247	525~1247	525~1247
			IPT(fz)	.012~.008	.012~.008	.012~.008	.014~.012	.014~.012	.014~.012	.014~.012
			RPM	6370~15120	5090~12100	4240~10080	3180~7560	2550~6050	2040~4840	1700~4030
			IPM(FEED)	150~240	120~190	100~160	90~180	70~140	60~110	50~100
H	38	Hardened steel	SFM(Vc)	262~722	262~722	262~722	262~722	262~722	262~722	262~722
			IPT(fz)	.004~.002	.004~.002	.004~.002	.006~.002	.006~.002	.006~.002	.006~.002
			RPM	3180~8750	2550~7000	2120~5840	1590~4380	1270~3500	1020~2800	850~2330
			IPM(FEED)	30~30	20~30	20~20	20~20	20~20	10~10	10~10

XR1D, XRAD SERIES — CORNER RADIUS INSERTS for GRAPHITE

ISO	VDI 3323	Material Description	Parameter	O.D SIZE (Ø) 5/16 (8)	3/8 (10)	1/2 (12, 13)	5/8 (16, 17)	3/4 (20, 21)	1 (25, 26)	1-1/4 (30, 32)
				Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing	Semi ~ finishing
N	21~22	Aluminum-wrought alloy	SFM(Vc)	984~1312	984~1312	984~1312	984~1312	984~1312	984~1312	984~1312
			IPT(fz)	.008~.008	.008~.008	.008~.008	.008~.008	.010~.010	.010~.010	.010~.010
			RPM	11940~15920	9550~12730	7960~10610	5970~7960	4770~6370	3820~5090	3180~4240
			IPM(FEED)	190~250	150~200	130~170	90~130	90~130	80~100	60~80
	23~24	Aluminum-cast, alloyed	SFM(Vc)	984~1312	984~1312	984~1312	984~1312	984~1312	984~1312	984~1312
			IPT(fz)	.008~.008	.008~.008	.008~.008	.008~.008	.010~.010	.010~.010	.010~.010
			RPM	11940~15920	9550~12730	7960~10610	5970~7960	4770~6370	3820~5090	3180~4240
			IPM(FEED)	190~250	150~200	130~170	90~130	90~130	80~100	60~80
	29.2	Graphite	SFM(Vc)	984~1312	984~1312	984~1312	984~1312	984~1312	984~1312	984~1312
			IPT(fz)	.008~.008	.008~.008	.008~.008	.008~.008	.010~.010	.010~.010	.010~.010
			RPM	11940~15920	9550~12730	7960~10610	5970~7960	4770~6370	3820~5090	3180~4240
			IPM(FEED)	190~250	150~200	130~170	90~130	90~130	80~100	60~80



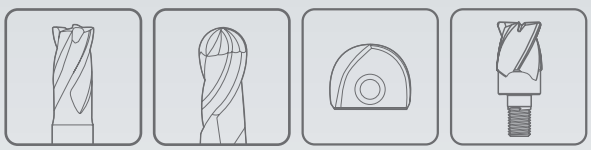
ae : Roughing - 0.1 x D
Finishing - .008"

ap : Roughing - Under Ø5/8 : 0.025 x D
From Ø5/8 : 0.05 x D

Finishing - Under Ø5/8 : .004"
From Ø5/8 : .008"

▶ When the length of overhang exceeds 4xD, we recommend using the carbide shank holder with 20% lower feed
▶ When using long (long & intermediate type holder) tools, we recommend reducing the feed rate to 70 ~ 85%.

Global Cutting Tool Leader **YG-1**



MILLING

YG

Leading Through Innovation

SOLID CARBIDE

i-SMART MODULAR TYPE END MILL

- For General Steels, Hardened Steels and Cast Iron

SELECTION GUIDE

YG MILLING TOOLS

CARBIDE MODULAR HEAD & HOLDER
i-SMART END MILLS

For General Steels, Hardened Steels and Cast Iron

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C80

SERIES	XGMF15	XGMF17	XGMF20	XGMF25	XGMF29	ZMC	ZMS	ZMT
FLUTE	2	4	4	4	6	-	-	-
HELIX ANGLE	30°	30°	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	45°	-	-	-
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE	SQUARE	-	-	-
SIZE MIN	R3/16	R3/16	D3/8	D3/8	D3/8	-	-	-
SIZE MAX	R5/8	R5/8	D1-1/4	D1-1/4	D1-1/4	-	-	-
PAGE	C72	C73	C74	C75	C76	C77	C78	C79
	-	-	-	-	-	STRAIGHT NECK	STRAIGHT NECK	TAPER NECK
	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Carbide	Steel	Steel

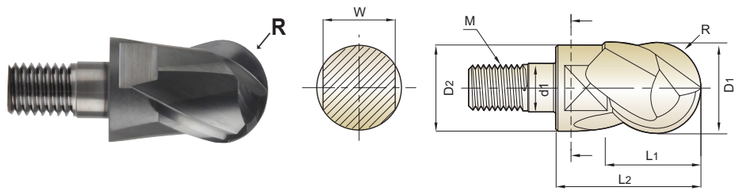
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	1
	2		About 0.45% C	Annealed	190	13	○	○	○	2
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	3
	4		About 0.75% C	Annealed	270	28	○	○	○	4
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	5
	6	Low alloy steel		Annealed	180	10	○	○	○	6
	7			Quenched & Tempered	275	29	○	○	○	7
	8			Quenched & Tempered	300	32	○	○	○	8
	9			Quenched & Tempered	350	38	◎	◎	◎	9
	10-11.1	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	10
	11.2			Quenched & Tempered	325	35	◎	◎	◎	11
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				12
	13		Martensitic	Quenched & Tempered	240	23				13
	14.1		Austenitic		180	10		○		14
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	15
	16		Pearlitic (Martensitic)		260	26	○	○	○	16
	17	Nodular cast iron	Ferritic		160	3	○	○	○	17
	18		Pearlitic		250	25	○	○	○	18
	19	Malleable cast iron	Ferritic		130		○	○	○	19
	20		Pearlitic		230	21	○	○	○	20
N	21	Aluminum-wrought alloy	Not Curable		60					21
	22		Curable	Hardened	100					22
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					23
	24		≤ 12% Si, Curable	Hardened	90					24
	25		> 12% Si, Not Curable		130					25
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					26
	27		CuZn, CuSnZn (Brass)		90					27
	28		CuSn, lead-free copper and electrolytic copper		100					28
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							29
	30		Rubber, Wood, etc.							30
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				31
	32			Cured	280	30				32
	33		Ni or Co Based	Annealed	250	25				33
	34			Cured	350	38				34
	35			Cast	320	34				35
	36	Titanium Alloys	Pure Titanium		400 Rm					36
	37		Alpha + Beta Alloys	Hardened	1050 Rm					37
H	38.1-38.2	Hardened steel		Hardened	550	55	○	○	○	38
	39			Hardened	630	60				39
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	40
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	41

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

i-Smart END MILLS

XGMF15 SERIES

CARBIDE MODULAR HEAD, 2 FLUTE BALL NOSE



CARBIDE | 2 | 30° | R ±.0004 | Y Coating | p.C80

Unit: Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	R	D1	D2	L1	L2	d1	W	M	
XGMF15024	R3/16	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF15032	R1/4	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF15040	R5/16	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF15048	R3/8	**3/4**	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF15100	R1/2	**1**	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF15116	R5/8	**1-1/4**	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Radius Tolerance(Inch)	Mill Dia. Tolerance(Inch)
±.0004	0~-.0008

◎ : Excellent ○ : Good

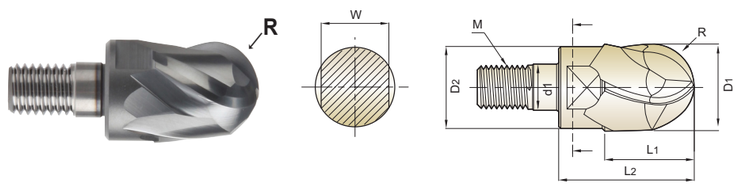
ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

i-Smart END MILLS

XGMF17 SERIES

CARBIDE MODULAR HEAD, 4 FLUTE BALL NOSE



CARBIDE | 4 | 30° | R ±.0004 | Y Coating | p.C81

Unit: Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	R	D1	D2	L1	L2	d1	W	M	
XGMF17024	R3/16	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF17032	R1/4	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF17040	R5/16	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF17048	R3/8	**3/4**	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF17100	R1/2	**1**	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF17116	R5/8	**1-1/4**	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Radius Tolerance(Inch)	Mill Dia. Tolerance(Inch)
±.0004	0~-.0008

◎ : Excellent ○ : Good

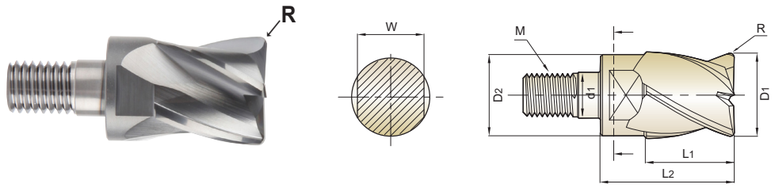
ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

i-Smart END MILLS

XGMF20 SERIES

CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX CORNER RADIUS



CARBIDE | 4 | 27°/30° | R ±.0008 | Y Coating | p.C82

Unit: Inch

EDP No.	Corner Radius	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	R	D1	D2	L1	L2	d1	W	M	
XGMF20024 012	R.012	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 020	R.020	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 030	R.030	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 040	R.040	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 050	R.050	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 060	R.060	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20024 080	R.080	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF20032 020	R.020	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 030	R.030	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 040	R.040	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 060	R.060	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20032 080	R.080	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF20040 020	R.020	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 030	R.030	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 040	R.040	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 060	R.060	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20040 080	R.080	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF20048 030	R.030	**3/4**	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF20048 040	R.040	**3/4**	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF20048 080	R.080	**3/4**	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF20100 030	R.030	**1**	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF20100 040	R.040	**1**	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF20100 080	R.080	**1**	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF20116 030	R.030	**1-1/4**	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700
XGMF20116 040	R.040	**1-1/4**	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700
XGMF20116 080	R.080	**1-1/4**	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Radius Tolerance(Inch)	Mill Dia. Tolerance(Inch)
±.0008	0~-.0012

◎ : Excellent ○ : Good

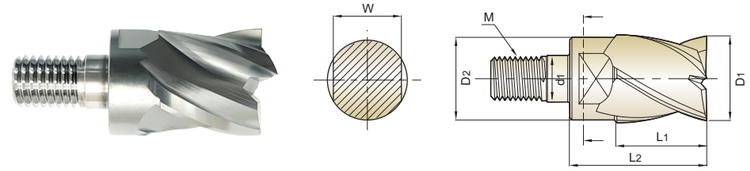
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

i-Smart END MILLS

XGMF25 SERIES

CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX



CARBIDE | 4 | 27°/30° | Y Coating | p.C83

Unit: Inch

EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	D1	D2	L1	L2	d1	W	M	
XGMF25024	**3/8**	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF25032	**1/2**	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF25040	**5/8**	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF25048	**3/4**	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF25100	**1**	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF25116	**1-1/4**	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Mill Dia. Tolerance(Inch)
0~-.0012

◎ : Excellent ○ : Good

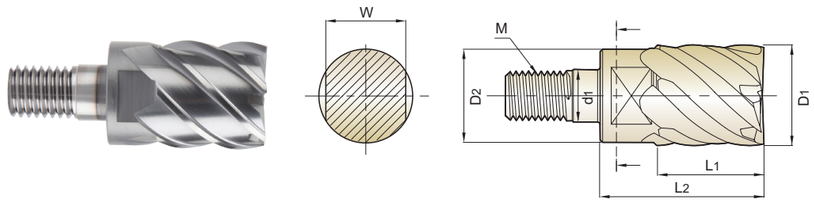
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

i-Smart END MILLS

XGMF29 SERIES

CARBIDE MODULAR HEAD, 6 FLUTE 45º HELIX



CARBIDE | 6 | 45° | Y Coating | p.C84

Unit: Inch

EDP No.	Mill Diameter	Neck Diameter	Length of Cut	Length Below Shank	Coupling Diameter	Wrench Width	Thread	Wrench
	D_1	D_2	L_1	L_2	d_1	W	M	
XGMF29024	3/8	.351	3/8	.689	.256	.315	M6	SPIS0810
XGMF29032	1/2	.469	1/2	.835	.256	.394	M6	SPIS0810
XGMF29040	5/8	.591	5/8	1.004	.335	.512	M8	SPIS1300
XGMF29048	3/4	.711	3/4	1.144	.413	.669	M10	SPIS1700
XGMF29100	1	.961	1	1.472	.492	.866	M12	SPIS2200
XGMF29116	1-1/4	1.221	1-1/4	1.772	.669	1.063	M16	SPIS2700

Mill Dia. Tolerance(Inch)
0~-.0012

◎ : Excellent ○ : Good

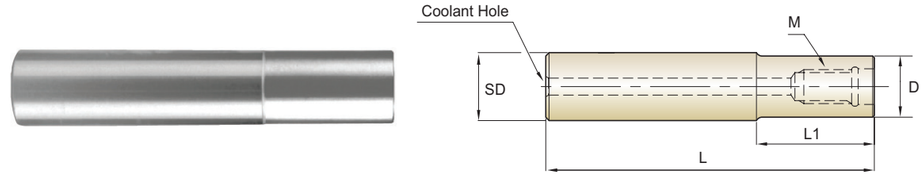
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10-11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1-38.2	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

i-Smart END MILLS

ZMC SERIES

CARBIDE HOLDER, STRAIGHT NECK TYPE



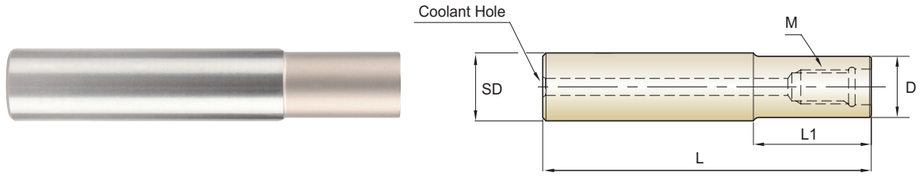
Unit: Inch

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Wrench No.	Coolant Hole
		SD	L	L_1	D	M		
ZMC024A024	3/8	3/8	2-3/4	25/32	23/64	M6	SPIS0810	5/64
ZMC024B024			3-15/16	1-37/64				
ZMC024C024			5-1/8	2-3/4				
ZMC032A032	1/2	1/2	3-1/8	25/32	29/64	M6	SPIS0810	5/64
ZMC032B032			3-15/16	1-37/64				
ZMC032C032			5-1/8	2-3/4				
ZMC040A040	5/8	5/8	3-15/16	1-37/64	19/32	M8	SPIS1300	1/8
ZMC040B040			5-7/8	3-5/32				
ZMC040C040			7-7/8	4-23/32				
ZMC048A048	3/4	3/4	3-15/16	1-37/64	45/64	M10	SPIS1700	5/32
ZMC048B048			5-7/8	3-5/32				
ZMC048C048			7-7/8	4-23/32				
ZMC048D048			9-13/16	6-19/64				
ZMC100A100	1	1	5-7/8	2-3/4	61/64	M12	SPIS2200	13/64
ZMC100B100			7-7/8	3-15/16				
ZMC100C100			9-13/16	5-29/32				
ZMC100D100			11-13/16	7-7/8				
ZMC116A116	1-1/4	1-1/4	5-7/8	2-3/4	1-9/64	M16	SPIS2700	15/64
ZMC116B116			7-7/8	4-23/32				
ZMC116C116			9-13/16	5-29/32				
ZMC116D116			11-13/16	7-7/8				
ZMC116E116			13-3/4	9-27/32				

i-Smart END MILLS

ZMS SERIES

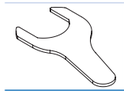
STEEL HOLDER, STRAIGHT NECK TYPE



Unit: Inch

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Coolant Hole
		SD	L	L_1	D	M	
ZMS024A024	**3/8**	3/8	2-3/4	25/32	23/64	M6	1/8
ZMS032A032	**1/2**	1/2	3-35/64	1-3/16	29/64	M6	1/8
ZMS040A040	**5/8**	5/8	3-15/16	1-3/16	19/32	M8	5/32
ZMS048A048	**3/4**	3/4	3-15/16	1-3/16	45/64	M10	13/64
ZMS100A100	**1**	1	4-17/32	1-37/64	61/64	M12	13/64
ZMS116A116	**1-1/4**	1-1/4	4-59/64	1-37/64	1-9/64	M16	15/64

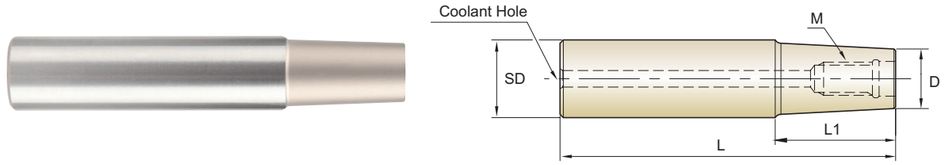
Wrench

Model	Wrench No.	Wrench Width	Mill Diameter	Clamping Torque [in•lbs]
	SPIS0810	.315	3/8	57.6
		.394	1/2	57.6
	SPIS1300	.512	5/8	88.6
	SPIS1700	.669	3/4	106.3
	SPIS2200	.866	1	132.9
	**SPIS2700**	1.063	1-1/4	177.1

i-Smart END MILLS

ZMT SERIES

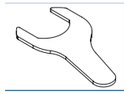
STEEL HOLDER, TAPER NECK TYPE



Unit: Inch

EDP No.	Mill Diameter	Shank Diameter	Overall Length	Neck Length	Neck Diameter	Thread Size	Coolant Hole
		SD	L	L_1	D	M	
ZMT024A032	**3/8**	1/2	3-15/16	1-31/32	23/64	M6	1/8
ZMT032A040	**1/2**	5/8	5-1/8	2-3/4	29/64	M6	1/8
ZMT040A048	**5/8**	3/4	5-29/32	3-35/64	19/32	M8	5/32
ZMT048A100	**3/4**	1	6-11/16	3-15/16	45/64	M10	13/64
ZMT100A116	**1**	1-1/4	7-7/8	4-21/64	61/64	M12	13/64
ZMT116A116	**1-1/4**	1-1/4	7-7/8	4-21/64	1-9/64	M16	15/64

Wrench

Model	Wrench No.	Wrench Width	Mill Diameter	Clamping Torque [in•lbs]
	SPIS0810	.315	3/8	57.6
		.394	1/2	57.6
	SPIS1300	.512	5/8	88.6
	SPIS1700	.669	3/4	106.3
	SPIS2200	.866	1	132.9
	**SPIS2700**	1.063	1-1/4	177.1

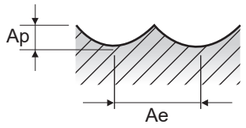
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL
INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

i-Smart END MILLS — RECOMMENDED CUTTING CONDITIONS

XGMF15 SERIES — 2 FLUTE BALL NOSE - Plain Cutting

SFM(Vc) = ft./min. IPT(fz) = in./tooth — RPM = rev./min. IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE (Ø) R3/16×3/8	R1/4×1/2	R5/16×5/8	R3/8×3/4	R1/2×1	R5/8×1-1/4
P	1-5	Non-alloy steel	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	.008	.008	.009	.010	.011	.012
					RPM	5680	4260	3410	2840	2130	1700
					IPM(FEED)	89.0	71.1	63.9	59.0	45.3	4.3
	6-8	Low alloy steel	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	.008	.008	.009	.010	.011	.012
					RPM	5680	4260	3410	2840	2130	1700
					IPM(FEED)	89.0	71.1	63.9	59.0	45.3	4.3
	9		0.08D	0.03D	SFM(Vc)	541	541	541	541	541	541
					IPT(fz)	.007	.007	.008	.009	.009	.010
					RPM	5510	4140	3310	2760	2070	1650
					IPM(FEED)	75.5	61.2	53.7	49.3	37.6	32.6
	10-11.1	High alloyed steel, and tool steel	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	.008	.008	.009	.010	.011	.012
					RPM	5680	4260	3410	2840	2130	1700
					IPM(FEED)	89.0	71.1	63.9	59.0	45.3	4.3
	11.2		0.08D	0.03D	SFM(Vc)	541	541	541	541	541	541
					IPT(fz)	.007	.007	.008	.009	.009	.010
					RPM	5510	4140	3310	2760	2070	1650
					IPM(FEED)	75.5	61.2	53.7	49.3	37.6	32.6
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.03D	SFM(Vc)	558	558	558	558	558	558
					IPT(fz)	.008	.008	.009	.010	.011	.012
					RPM	5680	4260	3410	2840	2130	1700
					IPM(FEED)	89.0	71.1	63.9	59.0	45.3	4.3
H	38.1-38.2	Hardened steel	0.08D	0.03D	SFM(Vc)	453	453	453	453	453	453
					IPT(fz)	.006	.007	.007	.008	.008	.009
					RPM	4610	3460	2770	2310	1730	1380
					IPM(FEED)	58.1	46.3	41.2	37.8	28.7	25.1
	40	Chilled Cast Iron	0.08D	0.03D	SFM(Vc)	541	541	541	541	541	541
					IPT(fz)	.007	.007	.008	.009	.009	.010
					RPM	5510	4140	3310	2760	2070	1650
					IPM(FEED)	75.5	61.2	53.7	49.3	37.6	32.6
	41	Hardened Cast Iron	0.08D	0.03D	SFM(Vc)	453	453	453	453	453	453
					IPT(fz)	.006	.007	.007	.008	.008	.009
					RPM	4610	3460	2770	2310	1730	1380
					IPM(FEED)	58.1	46.3	41.2	37.8	28.7	25.1

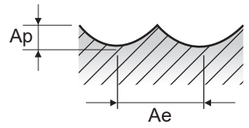


i-Smart END MILLS — RECOMMENDED CUTTING CONDITIONS

XGMF17 SERIES — 4 FLUTE BALL NOSE - Plain Cutting

SFM(Vc) = ft./min. IPT(fz) = in./tooth — RPM = rev./min. IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE (Ø) R3/16×3/8	R1/4×1/2	R5/16×5/8	R3/8×3/4	R1/2×1	R5/8×1-1/4
P	1-5	Non-alloy steel	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	.006	.006	.007	.007	.007	.008
					RPM	9860	7390	5920	4930	3700	2960
					IPM(FEED)	229.8	192.1	163	138.9	108.3	93.6
	6-8	Low alloy steel	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	.006	.006	.007	.007	.007	.008
					RPM	9860	7390	5920	4930	3700	2960
					IPM(FEED)	229.8	192.1	163	138.9	108.3	93.6
	9		0.05D	0.02D	SFM(Vc)	771	771	771	771	771	771
					IPT(fz)	.005	.006	.006	.006	.006	.007
					RPM	7850	5890	4710	3930	2940	2360
					IPM(FEED)	155.8	129.9	11.6	96.5	76.1	65.3
	10-11.1	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	.006	.006	.007	.007	.007	.008
					RPM	9860	7390	5920	4930	3700	2960
					IPM(FEED)	229.8	192.1	163	138.9	108.3	93.6
	11.2		0.05D	0.02D	SFM(Vc)	771	771	771	771	771	771
					IPT(fz)	.005	.006	.006	.006	.006	.007
					RPM	7850	5890	4710	3930	2940	2360
					IPM(FEED)	155.8	129.9	11.6	96.5	76.1	65.3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.02D	SFM(Vc)	968	968	968	968	968	968
					IPT(fz)	.006	.006	.007	.007	.007	.008
					RPM	9860	7390	5920	4930	3700	2960
					IPM(FEED)	229.8	192.1	163	138.9	108.3	93.6
H	38.1-38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	689	689	689	689	689	689
					IPT(fz)	.005	.005	.005	.006	.006	.006
					RPM	7020	5260	4210	3510	2630	2110
					IPM(FEED)	129.3	107.8	89.5	79.0	62.2	54.7
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	771	771	771	771	771	771
					IPT(fz)	.005	.006	.006	.006	.006	.007
					RPM	7850	5890	4710	3930	2940	2360
					IPM(FEED)	155.8	129.9	11.6	96.5	76.1	65.3
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	689	689	689	689	689	689
					IPT(fz)	.005	.005	.005	.006	.006	.006
					RPM	7020	5260	4210	3510	2630	2110
					IPM(FEED)	129.3	107.8	89.5	79.0	62.2	54.7



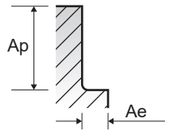
i-Smart END MILLS — RECOMMENDED CUTTING CONDITIONS

XGMF20 SERIES — 4 FLUTE CORNER RADIUS - Side Cutting

SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE (Ø) 3/8	1/2	5/8	3/4	1	1-1/4
P	1-5	Non-alloy steel	0.05D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	5210	3910	3130	2610	1950	1560
					IPM(FEED)	18.9	14.2	11.3	9.4	7.1	5.7
	6-8	Low alloy steel	0.05D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	5210	3910	3130	2610	1950	1560
					IPM(FEED)	18.9	14.2	11.3	9.4	7.1	5.7
	9		0.05D	0.8D	SFM(Vc)	344	344	344	344	344	344
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	3510	2630	2110	1750	1320	1050
					IPM(FEED)	14.9	11.2	9	7.5	5.6	4.5
	10-11.1	High alloyed steel, and tool steel	0.05D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	5210	3910	3130	2610	1950	1560
					IPM(FEED)	18.9	14.2	11.3	9.4	7.1	5.7
	11.2		0.05D	0.8D	SFM(Vc)	344	344	344	344	344	344
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	3510	2630	2110	1750	1320	1050
					IPM(FEED)	14.9	11.2	9	7.5	5.6	4.5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.02D	0.8D	SFM(Vc)	512	512	512	512	512	512
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	5210	3910	3130	2610	1950	1560
					IPM(FEED)	18.9	14.2	11.3	9.4	7.1	5.7
H	38.1-38.2	Hardened steel	0.02D	0.8D	SFM(Vc)	207	207	207	207	207	207
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	2110	1580	1260	1050	790	630
					IPM(FEED)	7.3	5.5	4.4	3.6	2.7	2.2
	40	Chilled Cast Iron	0.05D	0.8D	SFM(Vc)	344	344	344	344	344	344
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	3510	2630	2110	1750	1320	1050
					IPM(FEED)	14.9	11.2	9	7.5	5.6	4.5
	41	Hardened Cast Iron	0.02D	0.8D	SFM(Vc)	207	207	207	207	207	207
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	2110	1580	1260	1050	790	630
					IPM(FEED)	7.3	5.5	4.4	3.6	2.7	2.2

* 1.5xD Axial cutting depth should be for DIA over 5/8inch

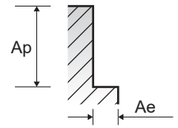


i-Smart END MILLS — RECOMMENDED CUTTING CONDITIONS

XGMF25 SERIES — 6 FLUTE SQUARE - Side Cutting

SFM(Vc) = ft./min. IPT(fz) = in./tooth RPM = rev./min. IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE (Ø) 3/8	1/2	5/8	3/4	1	1-1/4
P	1-5	Non-alloy steel	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	.002	.002	.002	.002	.002	.002
					RPM	4340	3260	2610	2170	1630	1300
					IPM(FEED)	27.4	2.5	16.4	13.7	1.3	8.2
	6-8	Low alloy steel	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	.002	.002	.002	.002	.002	.002
					RPM	4340	3260	2610	2170	1630	1300
					IPM(FEED)	27.4	2.5	16.4	13.7	1.3	8.2
	9		0.05D	0.6D	SFM(Vc)	262	262	262	262	262	262
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	2670	2010	1600	1340	1000	800
					IPM(FEED)	12.6	9.5	7.6	6.3	4.7	3.8
	10-11.1	High alloyed steel, and tool steel	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	.002	.002	.002	.002	.002	.002
					RPM	4340	3260	2610	2170	1630	1300
					IPM(FEED)	27.4	2.5	16.4	13.7	1.3	8.2
	11.2		0.05D	0.6D	SFM(Vc)	262	262	262	262	262	262
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	2670	2010	1600	1340	1000	800
					IPM(FEED)	12.6	9.5	7.6	6.3	4.7	3.8
M	14.1	Stainless steel	0.05D	0.6D	SFM(Vc)	217	217	217	217	217	217
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	2210	1650	1320	1100	830	660
					IPM(FEED)	12.2	9.1	7.3	6.1	4.6	3.6
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.6D	SFM(Vc)	427	427	427	427	427	427
					IPT(fz)	.002	.002	.002	.002	.002	.002
					RPM	4340	3260	2610	2170	1630	1300
					IPM(FEED)	27.4	2.5	16.4	13.7	1.3	8.2
H	38.1-38.2	Hardened steel	0.05D	0.6D	SFM(Vc)	174	174	174	174	174	174
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	1770	1330	1060	890	660	530
					IPM(FEED)	3.6	2.7	2.2	1.8	1.4	1.1
	40	Chilled Cast Iron	0.05D	0.6D	SFM(Vc)	262	262	262	262	262	262
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	2670	2010	1600	1340	1000	800
					IPM(FEED)	12.6	9.5	7.6	6.3	4.7	3.8
	41	Hardened Cast Iron	0.02D	0.6D	SFM(Vc)	174	174	174	174	174	174
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	1770	1330	1060	890	660	530
					IPM(FEED)	3.6	2.7	2.2	1.8	1.4	1.1



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

i-Smart END MILLS

RECOMMENDED CUTTING CONDITIONS

XGMF29 SERIES — 6 FLUTE SQUARE - Side Cutting

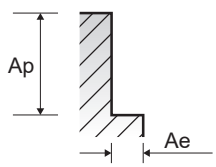
SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

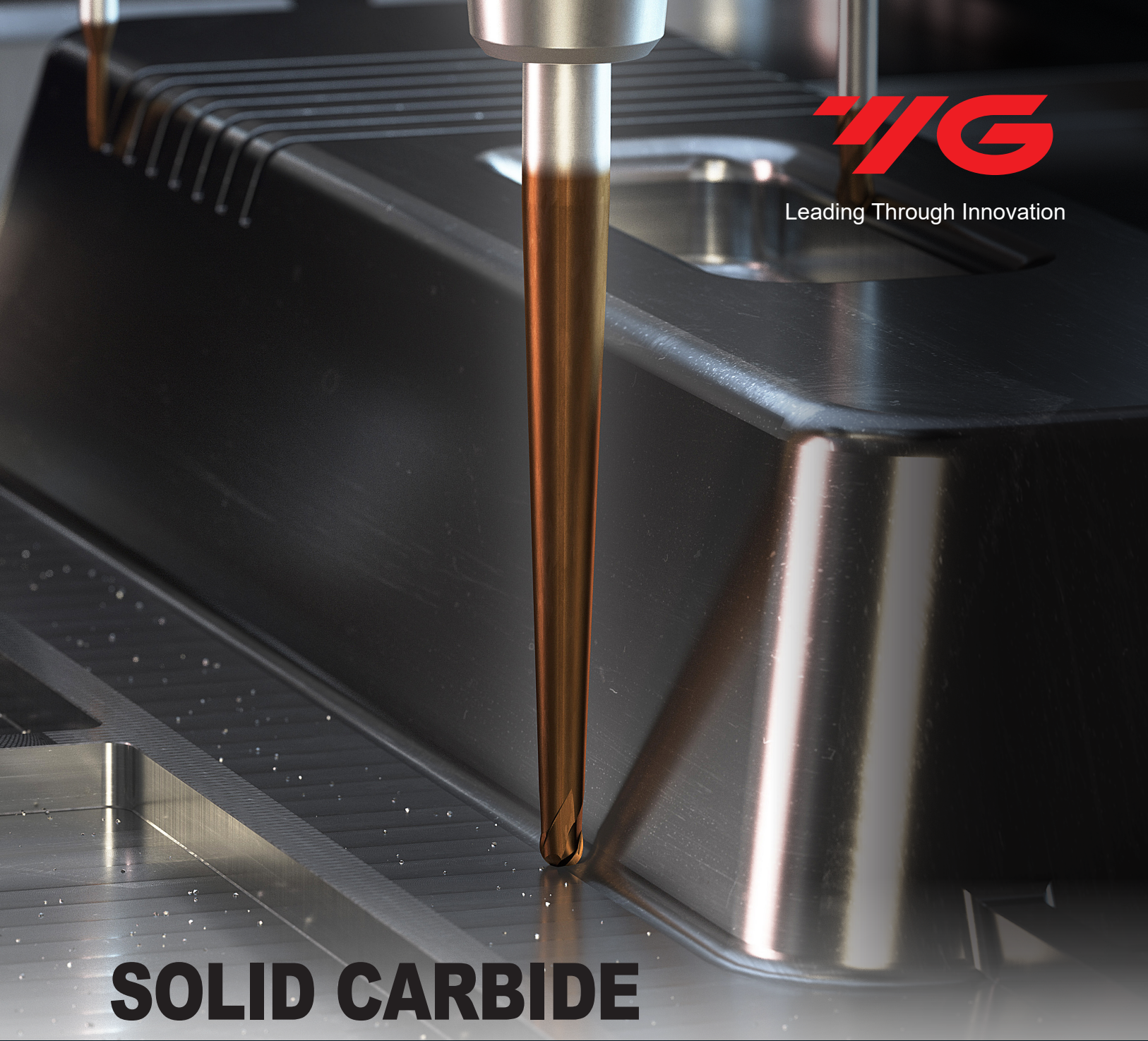
Normal

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE (Ø) 3/8	1/2	5/8	3/4	1	1-1/4
P	1-5	Non-alloy steel	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	3710	2780	2230	1850	1390	1110
					IPM(FEED)	87.6	65.7	52.6	43.8	32.9	26.3
	6-8	Low alloy steel	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	3710	2780	2230	1850	1390	1110
					IPM(FEED)	87.6	65.7	52.6	43.8	32.9	26.3
	9		0.1D	0.8D	SFM(Vc)	253	253	253	253	253	253
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	2570	1930	1540	1290	960	770
					IPM(FEED)	57.1	42.9	34.3	28.6	21.4	17.1
	10-11.1	High alloyed steel, and tool steel	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	3710	2780	2230	1850	1390	1110
					IPM(FEED)	87.6	65.7	52.6	43.8	32.9	26.3
	11.2		0.1D	0.8D	SFM(Vc)	253	253	253	253	253	253
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	2570	1930	1540	1290	960	770
					IPM(FEED)	57.1	42.9	34.3	28.6	21.4	17.1
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	0.8D	SFM(Vc)	364	364	364	364	364	364
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	3710	2780	2230	1850	1390	1110
					IPM(FEED)	87.6	65.7	52.6	43.8	32.9	26.3
H	38.1-38.2	Hardened steel	0.05D	0.6D	SFM(Vc)	108	108	108	108	108	108
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	1100	830	660	550	410	330
					IPM(FEED)	9.1	6.8	5.5	4.6	3.4	2.7
	40	Chilled Cast Iron	0.05D	0.8D	SFM(Vc)	253	253	253	253	253	253
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	2570	1930	1540	1290	960	770
					IPM(FEED)	57.1	42.9	34.3	28.6	21.4	17.1
	41	Hardened Cast Iron	0.05D	0.6D	SFM(Vc)	108	108	108	108	108	108
					IPT(fz)	.001	.001	.001	.001	.001	.001
					RPM	1100	830	660	550	410	330
					IPM(FEED)	9.1	6.8	5.5	4.6	3.4	2.7

High

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	O.D SIZE (Ø) 3/8	1/2	5/8	3/4	1	1-1/4
P	11.2	High alloyed steel, and tool steel	0.05D	0.6D	SFM(Vc)	1089	1089	1089	1089	1089	1089
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	11090	8320	6660	5550	4160	3330
					IPM(FEED)	249	186.7	149.4	124.5	93.4	74.7
H	38.1-38.2	Hardened steel	0.05D	0.4D	SFM(Vc)	545	545	545	545	545	545
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	5550	4160	3330	2770	2080	1660
					IPM(FEED)	124.5	93.4	74.7	62.2	46.7	37.3
	40	Chilled Cast Iron	0.05D	0.6D	SFM(Vc)	1089	1089	1089	1089	1089	1089
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	11090	8320	6660	5550	4160	3330
					IPM(FEED)	249	186.7	149.4	124.5	93.4	74.7
	41	Hardened Cast Iron	0.05D	0.4D	SFM(Vc)	545	545	545	545	545	545
					IPT(fz)	.004	.004	.004	.004	.004	.004
					RPM	5550	4160	3330	2770	2080	1660
					IPM(FEED)	124.5	93.4	74.7	62.2	46.7	37.3





Leading Through Innovation

SOLID CARBIDE

X1-EH END MILLS

- Highly Accurate Fine-Finishing for High Hardened Steel

SELECTION GUIDE

YG MILLING TOOLS

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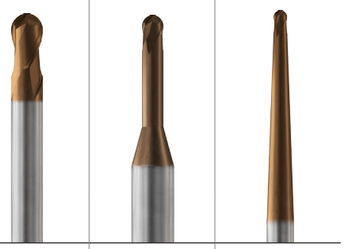
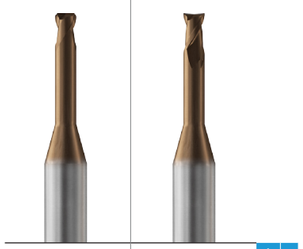
Please visit globalyg1.com/mat for material search

Highly Accurate Fine-Finishing for High Hardened Steel

Recommended cutting conditions : p.C123

◎ : Excellent ○ : Good

SERIES	HPI90	HPI91	HPI92	HPI89	HPI88
FLUTE	2	2	2	2	2
HELIX ANGLE	30°	30°	30°	35°	35°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	SQUARE
SIZE MIN	R0.05	R0.05	R0.05	D0.2	D0.1
SIZE MAX	R10.0	R3.0	R6.0	D3.0	D6.0
PAGE	C88	C89	C99	C109	C116
	-	RIB PROCESSING	TAPER NECK	RIB PROCESSING	RIB PROCESSING
	C-Coating	C-Coating	C-Coating	C-Coating	C-Coating

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	HPI90	HPI91	HPI92	HPI89	HPI88	VDI 3323	ISO
P	1	Non-alloy steel	About 0.15% C	Annealed	125							1	P
	2		About 0.45% C	Annealed	190	13						2	
	3		About 0.45% C	Quenched & tempered	250	25						3	
	4		About 0.75% C	Annealed	270	28						4	
	5		About 0.75% C	Quenched & tempered	300	32	○	○	○	○	○	5	
	6	Low alloy steel		Annealed	180	10						6	
	7			Quenched & tempered	275	29						7	
	8			Quenched & tempered	300	32	○	○	○	○	○	8	
	9			Quenched & tempered	350	38	○	○	○	○	○	9	
	10	High alloyed steel, and tool steel		Annealed	200	15						10	
	11.1			Quenched & Tempered	325	35	○	○	○	○	○	11.1	
	11.2			Quenched & Tempered	409	44	○	○	○	○	○	11.2	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15						12	M
	13		Martensitic	Quenched & Tempered	240	23						13	
	14.1			Austenitic	180	10						14.1	
	14.2			PH Stainless Steel	180	10						14.2	
K	15	Grey cast iron	Pearlitic / ferritic		180	10						15	K
	16		Pearlitic (Martensitic)		260	26						16	
	17	Nodular cast iron	Ferritic		160	3						17	
	18		Pearlitic		250	25						18	
	19	Malleable cast iron	Ferritic		130							19	
	20		Pearlitic		230	21						20	
N	21	Aluminum-wrought alloy	Not Curable		60							21	N
	22		Curable	Hardened	100							22	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75							23	
	24		≤ 12% Si, Curable	Hardened	90							24	
	25		> 12% Si, Not Curable		130							25	
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110							26	
	27		CuZn, CuSnZn (Brass)		90							27	
	28		CuSn, lead-free copper and electrolytic copper		100							28	
	29.1	Non Metallic Materials	Duroplastic									29.1	
	29.2		GRAPHITE									29.2	
	29.3		CFRP, GFRP									29.3	
	30		Rubber, Wood, etc.									30	
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15						31	S
	32			Cured	280	30						32	
	33		Ni or Co Based	Annealed	250	25						33	
	34			Cured	350	38						34	
	35			Cast	320	34						35	
	36	Titanium Alloys	Pure Titanium		400 Rm							36	
	37		Alpha + Beta Alloys	Hardened	1050 Rm							37	
H	38.1	Hardened steel		Hardened	421-469	45-49	◎	◎	◎	◎	◎	38.1	H
	38.2			Hardened	481-560	50-55	◎	◎	◎	◎	◎	38.2	
	39.1			Hardened	577-654	56-60	◎	◎	◎	◎	◎	39.1	
	39.2			Hardened	670-739	61-65	◎	◎	◎	◎	◎	39.2	
	39.3			Hardened		66-70	◎	◎	◎	◎	◎	39.3	
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○	○	40	
	41	Hardened Cast Iron		Hardened	550	55	◎	◎	◎	◎	◎	41	

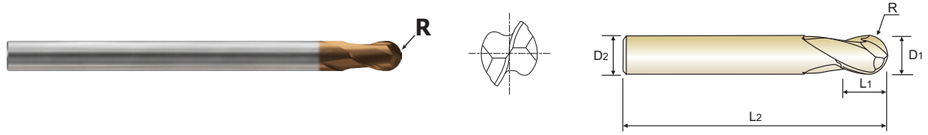
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X1-EH END MILLS

PLAIN SHANK **HPI90** SERIES

CARBIDE, 2 FLUTE BALL NOSE

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C123

R0.05~R3 R4~R10

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
HPI90001	R0.05	**0.1**	4	0.1	50
HPI900015	R0.075	**0.15**	4	0.15	50
HPI90002	R0.1	**0.2**	4	0.2	50
HPI90003	R0.15	**0.3**	4	0.3	50
HPI90004	R0.2	**0.4**	4	0.6	50
HPI90005	R0.25	**0.5**	4	0.8	50
HPI90006	R0.3	**0.6**	4	0.9	50
HPI90008	R0.4	**0.8**	4	1.2	50
HPI90010	R0.5	**1.0**	4	1.5	50
HPI90015	R0.75	**1.5**	4	2.3	50
HPI90020	R1.0	**2.0**	4	3	60
HPI90025	R1.25	**2.5**	6	3.8	60
HPI90030	R1.5	**3.0**	6	5	60
HPI90040	R2.0	**4.0**	4	6	70
HPI90901	R2.0	**4.0**	6	6	70
HPI90050	R2.5	**5.0**	6	8	70
HPI90060	R3.0	**6.0**	6	10	80
HPI90080	R4.0	**8.0**	8	12	100
HPI90100	R5.0	**10.0**	10	15	100
HPI90120	R6.0	**12.0**	12	18	110
HPI90160	R8.0	**16.0**	16	24	140
HPI90200	R10.0	**20.0**	20	30	160

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P														M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel					Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

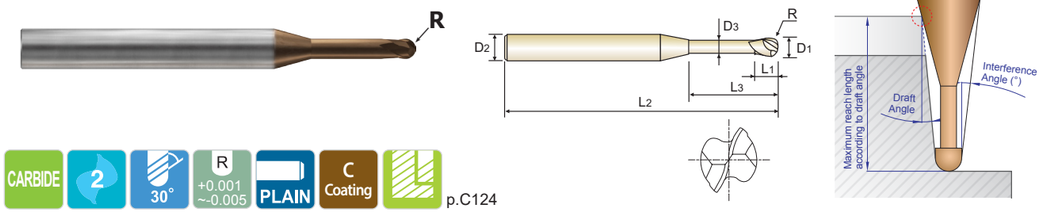
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91001	R0.05	**0.1**	4	0.07	0.2	45	0.085	14.66	0.25	0.26	0.28	0.29	0.32
HPI91901	R0.05	**0.1**	4	0.07	0.3	45	0.085	14.47	0.36	0.37	0.39	0.41	0.47
HPI91902	R0.05	**0.1**	4	0.07	0.5	45	0.085	14.11	0.57	0.60	0.63	0.66	0.75
HPI910015	R0.075	**0.15**	4	0.1	0.3	45	0.135	14.51	0.36	0.37	0.39	0.41	0.46
HPI91903	R0.075	**0.15**	4	0.1	0.5	45	0.135	14.15	0.57	0.59	0.62	0.66	0.74
HPI91904	R0.075	**0.15**	4	0.1	1	45	0.135	13.31	1.09	1.15	1.21	1.28	1.45
HPI91002	R0.1	**0.2**	4	0.15	0.3	45	0.17	14.50	0.40	0.42	0.43	0.46	0.51
HPI91905	R0.1	**0.2**	4	0.15	0.5	45	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91906	R0.1	**0.2**	4	0.15	0.75	45	0.17	13.70	0.87	0.92	0.96	1.02	1.15
HPI91907	R0.1	**0.2**	4	0.15	1	45	0.17	13.29	1.14	1.19	1.26	1.33	1.50
HPI91908	R0.1	**0.2**	4	0.15	1	50	0.17	13.29	1.14	1.19	1.26	1.33	1.50
HPI91909	R0.1	**0.2**	4	0.15	1.25	45	0.17	12.90	1.40	1.47	1.55	1.64	1.86
HPI91910	R0.1	**0.2**	4	0.15	1.5	45	0.17	12.53	1.66	1.75	1.84	1.95	2.21
HPI91911	R0.1	**0.2**	4	0.15	1.75	45	0.17	12.19	1.93	2.03	2.14	2.26	2.57
HPI91912	R0.1	**0.2**	4	0.15	2	45	0.17	11.86	2.19	2.30	2.43	2.58	2.92
HPI91913	R0.1	**0.2**	4	0.15	2.5	45	0.17	11.26	2.71	2.86	3.02	3.20	3.64
HPI91914	R0.1	**0.2**	4	0.15	3	45	0.17	10.71	3.24	3.41	3.61	3.82	4.35
HPI91915	R0.1	**0.2**	4	0.2	0.5	35	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91916	R0.1	**0.2**	4	0.2	0.5	50	0.17	14.13	0.61	0.64	0.67	0.70	0.79
HPI91917	R0.1	**0.2**	6	0.2	0.5	50	0.17	14.42	0.61	0.64	0.67	0.70	0.79
HPI91003	R0.15	**0.3**	4	0.2	0.5	45	0.27	14.20	0.61	0.63	0.66	0.69	0.77
HPI91918	R0.15	**0.3**	4	0.2	0.6	45	0.27	14.02	0.71	0.74	0.78	0.82	0.91
HPI91919	R0.15	**0.3**	4	0.2	0.75	45	0.27	13.75	0.87	0.91	0.95	1.00	1.12
HPI91920	R0.15	**0.3**	4	0.2	1	45	0.27	13.33	1.13	1.19	1.25	1.32	1.48
HPI91921	R0.15	**0.3**	4	0.2	1.25	45	0.27	12.93	1.40	1.47	1.54	1.63	1.84
HPI91922	R0.15	**0.3**	4	0.2	1.5	45	0.27	12.55	1.66	1.74	1.84	1.94	2.19

▶NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P														M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel					Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

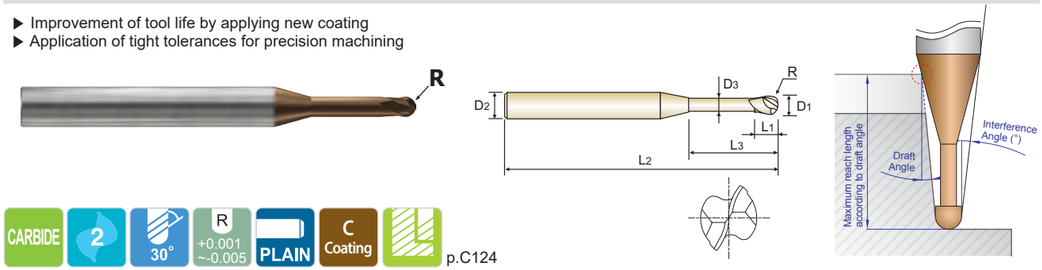
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

YG X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91923	R0.15	**0.3**	4	0.2	1.75	45	0.27	12.19	1.92	2.02	2.13	2.25	2.55
HPI91924	R0.15	**0.3**	4	0.2	2	45	0.27	11.86	2.19	2.30	2.42	2.56	2.90
HPI91925	R0.15	**0.3**	4	0.2	2.25	45	0.27	11.54	2.45	2.58	2.72	2.87	3.26
HPI91926	R0.15	**0.3**	4	0.2	2.5	45	0.27	11.24	2.71	2.85	3.01	3.19	3.61
HPI91927	R0.15	**0.3**	4	0.2	3	45	0.27	10.68	3.24	3.41	3.60	3.81	4.33
HPI91928	R0.15	**0.3**	4	0.2	3.5	45	0.27	10.17	3.76	3.96	4.18	4.43	5.04
HPI91929	R0.15	**0.3**	4	0.2	4	45	0.27	9.71	4.29	4.52	4.77	5.06	5.75
HPI91930	R0.15	**0.3**	6	0.2	1.5	50	0.27	13.31	1.66	1.74	1.84	1.94	2.19
HPI91004	R0.2	**0.4**	4	0.3	0.5	45	0.37	14.28	0.61	0.63	0.65	0.68	0.75
HPI91931	R0.2	**0.4**	4	0.3	0.8	45	0.37	13.72	0.92	0.96	1.00	1.05	1.17
HPI91932	R0.2	**0.4**	4	0.3	1	45	0.37	13.37	1.13	1.18	1.24	1.30	1.46
HPI91933	R0.2	**0.4**	4	0.3	1.5	45	0.37	12.57	1.66	1.74	1.83	1.93	2.17
HPI91934	R0.2	**0.4**	4	0.3	2	45	0.37	11.86	2.18	2.29	2.41	2.55	2.88
HPI91935	R0.2	**0.4**	4	0.3	2.5	45	0.37	11.22	2.71	2.85	3.00	3.17	3.59
HPI91936	R0.2	**0.4**	4	0.3	3	45	0.37	10.65	3.24	3.40	3.59	3.80	4.31
HPI91937	R0.2	**0.4**	4	0.3	3.5	45	0.37	10.13	3.76	3.96	4.18	4.42	5.02
HPI91938	R0.2	**0.4**	4	0.3	4	45	0.37	9.66	4.29	4.51	4.76	5.04	5.73
HPI91939	R0.2	**0.4**	4	0.3	4.5	45	0.37	9.23	4.81	5.07	5.35	5.67	6.44
HPI91940	R0.2	**0.4**	4	0.3	5	45	0.37	8.84	5.34	5.62	5.94	6.29	7.15
HPI91941	R0.2	**0.4**	4	0.3	6	45	0.37	8.15	6.39	6.73	7.11	7.54	8.57
HPI91942	R0.2	**0.4**	4	0.4	1	35	0.37	13.37	1.13	1.18	1.24	1.30	1.46
HPI91943	R0.2	**0.4**	4	0.4	1	50	0.37	13.37	1.13	1.18	1.24	1.30	1.46
HPI91944	R0.2	**0.4**	6	0.3	1	50	0.37	13.91	1.13	1.18	1.24	1.30	1.46
HPI91945	R0.2	**0.4**	6	0.3	2	50	0.37	12.82	2.18	2.29	2.41	2.55	2.88
HPI91946	R0.2	**0.4**	6	0.4	1	50	0.37	13.91	1.13	1.18	1.24	1.30	1.46
HPI91005	R0.25	**0.5**	4	0.35	1	45	0.45	13.35	1.19	1.24	1.30	1.36	1.52

▶NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2		12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○										

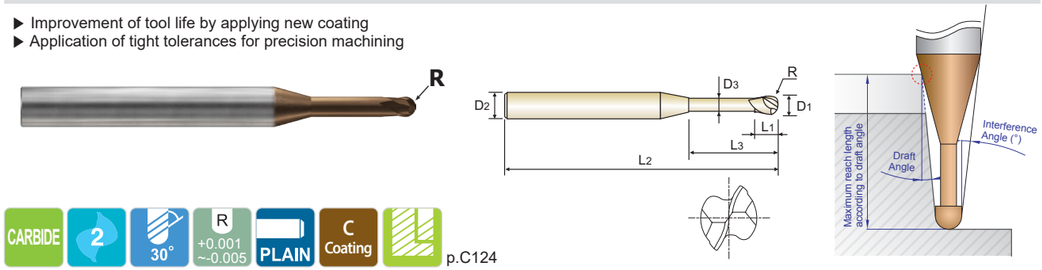
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

YG X1-EH END MILLS

PLAIN SHANK HPI91 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91947	R0.25	**0.5**	4	0.35	1.5	45	0.45	12.53	1.71	1.79	1.88	1.99	2.23
HPI91948	R0.25	**0.5**	4	0.35	2	45	0.45	11.80	2.24	2.35	2.47	2.61	2.94
HPI91949	R0.25	**0.5**	4	0.35	2.5	45	0.45	11.16	2.77	2.90	3.06	3.23	3.65
HPI91950	R0.25	**0.5**	4	0.35	3	45	0.45	10.57	3.29	3.46	3.65	3.86	4.36
HPI91951	R0.25	**0.5**	4	0.35	3.5	45	0.45	10.05	3.82	4.01	4.23	4.48	5.08
HPI91952	R0.25	**0.5**	4	0.35	4	45	0.45	9.57	4.34	4.57	4.82	5.10	5.79
HPI91953	R0.25	**0.5**	4	0.35	4.5	45	0.45	9.14	4.87	5.12	5.41	5.73	6.50
HPI91954	R0.25	**0.5**	4	0.35	5	45	0.45	8.75	5.40	5.68	5.99	6.35	7.21
HPI91955	R0.25	**0.5**	4	0.35	5.5	45	0.45	8.38	5.92	6.23	6.58	6.97	7.92
HPI91956	R0.25	**0.5**	4	0.35	6	45	0.45	8.05	6.45	6.79	7.17	7.60	8.63
HPI91957	R0.25	**0.5**	4	0.35	8	45	0.45	6.94	8.55	9.01	9.52	10.09	11.43
HPI91958	R0.25	**0.5**	4	0.35	10	45	0.45	6.10	10.66	11.23	11.87	12.58	13.76
HPI91959	R0.25	**0.5**	4	0.5	1.25	50	0.45	12.93	1.45	1.52	1.59	1.67	1.87
HPI91960	R0.25	**0.5**	6	0.5	1.25	50	0.45	13.61	1.45	1.52	1.59	1.67	1.87
HPI91006	R0.3	**0.6**	4	0.45	1	45	0.55	13.40	1.19	1.23	1.29	1.35	1.50
HPI91961	R0.3	**0.6**	4	0.45	1.5	45	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91962	R0.3	**0.6**	4	0.45	2	45	0.55	11.80	2.24	2.34	2.46	2.60	2.92
HPI91963	R0.3	**0.6**	4	0.45	2.5	45	0.55	11.13	2.76	2.90	3.05	3.22	3.63
HPI91964	R0.3	**0.6**	4	0.45	3	45	0.55	10.54	3.29	3.45	3.64	3.84	4.34
HPI91965	R0.3	**0.6**	4	0.45	3.5	45	0.55	10.00	3.82	4.01	4.22	4.47	5.06
HPI91966	R0.3	**0.6**	4	0.45	4	45	0.55	9.52	4.34	4.56	4.81	5.09	5.77
HPI91967	R0.3	**0.6**	4	0.45	4.5	45	0.55	9.08	4.87	5.12	5.40	5.71	6.48
HPI91968	R0.3	**0.6**	4	0.45	5	45	0.55	8.68	5.39	5.67	5.99	6.34	7.19
HPI91969	R0.3	**0.6**	4	0.45	5.5	45	0.55	8.31	5.92	6.23	6.57	6.96	7.90
HPI91970	R0.3	**0.6**	4	0.45	6	45	0.55	7.97	6.45	6.78	7.16	7.58	8.61
HPI91971	R0.3	**0.6**	4	0.45	7	45	0.55	7.37	7.50	7.89	8.34	8.83	10.04

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Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2		12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○										

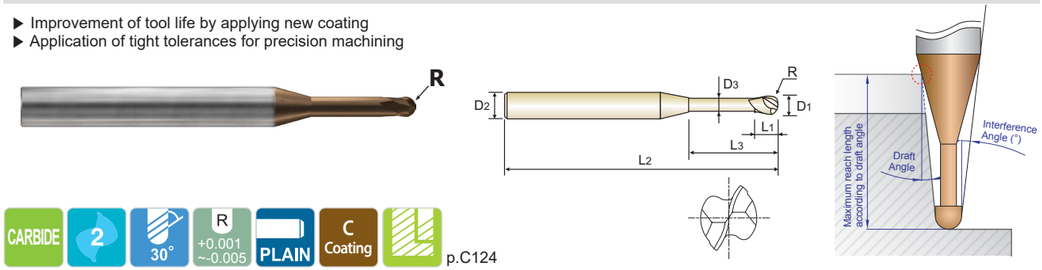
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK **HPI91** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91972	R0.3	**0.6**	4	0.45	8	45	0.55	6.86	8.55	9.00	9.51	10.08	11.36
HPI91973	R0.3	**0.6**	4	0.45	9	45	0.55	6.41	9.60	10.11	10.68	11.33	12.53
HPI91974	R0.3	**0.6**	4	0.45	10	45	0.55	6.01	10.65	11.22	11.86	12.57	13.70
HPI91975	R0.3	**0.6**	4	0.45	12	45	0.55	5.35	12.76	13.44	14.21	15.07	16.03
HPI91976	R0.3	**0.6**	4	0.6	1.5	35	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91977	R0.3	**0.6**	4	0.6	1.5	50	0.55	12.55	1.71	1.79	1.88	1.97	2.21
HPI91978	R0.3	**0.6**	6	0.45	2	50	0.55	12.81	2.24	2.34	2.46	2.60	2.92
HPI91979	R0.3	**0.6**	6	0.45	3	50	0.55	11.85	3.29	3.45	3.64	3.84	4.34
HPI91980	R0.3	**0.6**	6	0.45	4	50	0.55	11.02	4.34	4.56	4.81	5.09	5.77
HPI91981	R0.3	**0.6**	6	0.6	1.5	50	0.55	13.36	1.71	1.79	1.88	1.97	2.21
HPI91007	R0.35	**0.7**	4	0.5	2	45	0.65	11.80	2.24	2.34	2.45	2.58	2.90
HPI91982	R0.35	**0.7**	4	0.5	4	45	0.65	9.46	4.34	4.56	4.80	5.08	5.75
HPI91983	R0.35	**0.7**	4	0.5	6	45	0.65	7.89	6.44	6.78	7.15	7.57	8.59
HPI91984	R0.35	**0.7**	4	0.5	8	45	0.65	6.77	8.55	9.00	9.50	10.07	11.29
HPI91008	R0.4	**0.8**	4	0.6	2	45	0.75	11.79	2.23	2.33	2.45	2.57	2.88
HPI91985	R0.4	**0.8**	4	0.6	3	45	0.75	10.46	3.28	3.44	3.62	3.82	4.30
HPI91986	R0.4	**0.8**	4	0.6	4	45	0.75	9.40	4.34	4.55	4.79	5.07	5.72
HPI91987	R0.4	**0.8**	4	0.6	5	45	0.75	8.53	5.39	5.66	5.97	6.31	7.15
HPI91988	R0.4	**0.8**	4	0.6	6	45	0.75	7.81	6.44	6.77	7.14	7.56	8.57
HPI91989	R0.4	**0.8**	4	0.6	7	45	0.75	7.20	7.49	7.88	8.32	8.81	9.99
HPI91990	R0.4	**0.8**	4	0.6	8	45	0.75	6.68	8.54	8.99	9.49	10.05	11.23
HPI91991	R0.4	**0.8**	4	0.6	10	45	0.75	5.83	10.65	11.21	11.84	12.55	13.56
HPI91992	R0.4	**0.8**	4	0.6	12	45	0.75	5.18	12.75	13.43	14.19	15.04	15.90
HPI91993	R0.4	**0.8**	4	0.8	2	35	0.75	11.79	2.23	2.33	2.45	2.57	2.88
HPI91994	R0.4	**0.8**	4	0.8	2	50	0.75	11.79	2.23	2.33	2.45	2.57	2.88
HPI91995	R0.4	**0.8**	6	0.6	2	50	0.75	12.85	2.23	2.33	2.45	2.57	2.88

▶NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

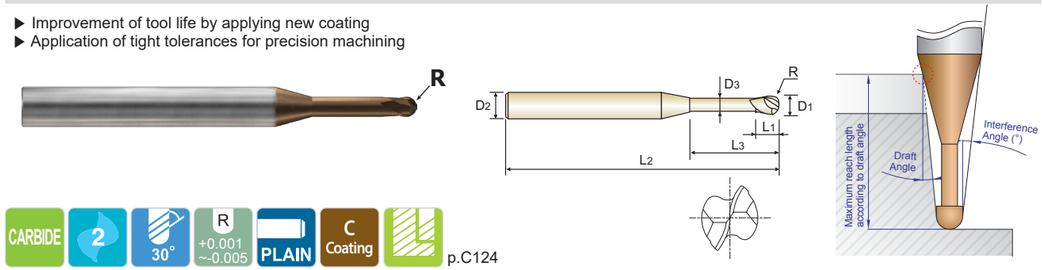
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

X1-EH END MILLS

PLAIN SHANK HPI91 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91996	R0.4	**0.8**	6	0.8	2	50	0.75	12.85	2.23	2.33	2.45	2.57	2.88
HPI91009	R0.45	**0.9**	4	0.65	2	45	0.85	11.79	2.23	2.33	2.44	2.56	2.86
HPI91997	R0.45	**0.9**	4	0.65	4	45	0.85	9.34	4.33	4.55	4.79	5.05	5.70
HPI91998	R0.45	**0.9**	4	0.65	6	45	0.85	7.72	6.44	6.77	7.13	7.55	8.55
HPI91999	R0.45	**0.9**	4	0.65	8	45	0.85	6.58	8.54	8.99	9.48	10.04	11.16
HPI91010	R0.5	**1.0**	4	0.75	2	45	0.95	11.78	2.23	2.32	2.43	2.55	2.84
HPI91801	R0.5	**1.0**	4	0.75	2.5	45	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91802	R0.5	**1.0**	4	0.75	3	45	0.95	10.38	3.28	3.43	3.60	3.79	4.26
HPI91803	R0.5	**1.0**	4	0.75	4	45	0.95	9.27	4.33	4.54	4.78	5.04	5.68
HPI91804	R0.5	**1.0**	4	0.75	5	45	0.95	8.37	5.38	5.65	5.95	6.29	7.10
HPI91805	R0.5	**1.0**	4	0.75	6	45	0.95	7.63	6.44	6.76	7.13	7.54	8.53
HPI91806	R0.5	**1.0**	4	0.75	7	45	0.95	7.01	7.49	7.87	8.30	8.78	9.93
HPI91807	R0.5	**1.0**	4	0.75	8	45	0.95	6.49	8.54	8.98	9.47	10.03	11.10
HPI91808	R0.5	**1.0**	4	0.75	9	45	0.95	6.03	9.59	10.09	10.65	11.28	12.26
HPI91809	R0.5	**1.0**	4	0.75	10	45	0.95	5.64	10.64	11.20	11.82	12.52	13.43
HPI91810	R0.5	**1.0**	4	0.75	12	45	0.95	4.99	12.75	13.42	14.17	14.96	15.77
HPI91811	R0.5	**1.0**	4	0.75	13	45	0.95	4.71	13.80	14.53	15.35	16.06	16.94
HPI91812	R0.5	**1.0**	4	0.75	14	50	0.95	4.47	14.85	15.64	16.52	17.17	18.10
HPI91813	R0.5	**1.0**	4	0.75	16	50	0.95	4.05	16.96	17.86	18.87	19.38	20.44
HPI91814	R0.5	**1.0**	4	0.75	18	55	0.95	3.70	19.06	20.08	21.05	21.59	22.78
HPI91815	R0.5	**1.0**	4	0.75	20	55	0.95	3.41	21.16	22.30	23.20	23.81	25.11
HPI91816	R0.5	**1.0**	4	1	2.5	40	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91817	R0.5	**1.0**	4	1	2.5	50	0.95	11.04	2.75	2.88	3.02	3.17	3.55
HPI91818	R0.5	**1.0**	6	0.75	3	50	0.95	11.84	3.28	3.43	3.60	3.79	4.26
HPI91819	R0.5	**1.0**	6	0.75	4	50	0.95	10.95	4.33	4.54	4.78	5.04	5.68
HPI91820	R0.5	**1.0**	6	0.75	5	50	0.95	10.18	5.38	5.65	5.95	6.29	7.10

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Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

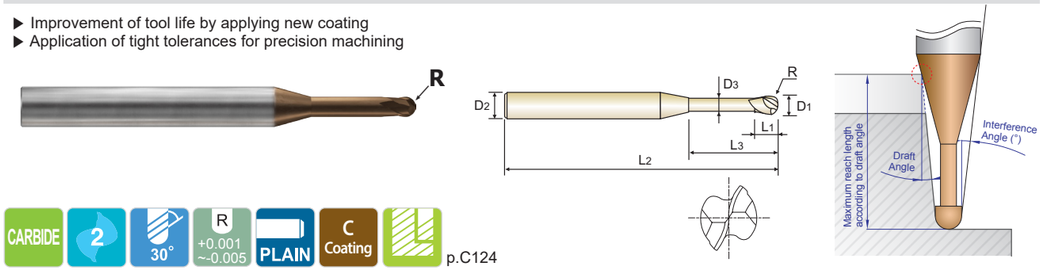
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

YG X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91821	R0.5	1.0	6	0.75	6	50	0.95	9.51	6.44	6.76	7.13	7.54	8.53
HPI91822	R0.5	1.0	6	0.75	7	50	0.95	8.92	7.49	7.87	8.30	8.78	9.95
HPI91823	R0.5	1.0	6	0.75	8	50	0.95	8.40	8.54	8.98	9.47	10.03	11.37
HPI91824	R0.5	1.0	6	0.75	10	50	0.95	7.53	10.64	11.20	11.82	12.52	14.22
HPI91825	R0.5	1.0	6	0.75	22	60	0.95	4.62	23.27	24.52	25.92	27.11	28.60
HPI91826	R0.5	1.0	6	1	2.5	50	0.95	12.34	2.75	2.88	3.02	3.17	3.55
HPI91012	R0.6	1.2	4	0.9	2.4	45	1.15	11.13	2.56	2.63	2.70	2.78	2.95
HPI91827	R0.6	1.2	4	0.9	4	45	1.15	9.12	4.21	4.34	4.47	4.62	4.94
HPI91828	R0.6	1.2	4	0.9	6	45	1.15	7.44	6.28	6.48	6.69	6.92	7.43
HPI91829	R0.6	1.2	4	0.9	8	45	1.15	6.28	8.35	8.62	8.90	9.22	9.92
HPI91830	R0.6	1.2	4	0.9	10	45	1.15	5.43	10.41	10.75	11.12	11.52	12.40
HPI91831	R0.6	1.2	4	0.9	12	45	1.15	4.79	12.48	12.89	13.34	13.82	14.89
HPI91832	R0.6	1.2	4	0.9	14	50	1.15	4.28	14.55	15.03	15.55	16.12	17.37
HPI91833	R0.6	1.2	4	0.9	16	50	1.15	3.87	16.61	17.17	17.77	18.42	19.86
HPI91834	R0.6	1.2	4	1.2	3	40	1.15	10.28	3.18	3.27	3.36	3.47	3.70
HPI91014	R0.7	1.4	4	1	8	45	1.35	6.06	8.34	8.61	8.89	9.20	9.89
HPI91835	R0.7	1.4	4	1	12	50	1.35	4.58	12.48	12.89	13.33	13.80	14.86
HPI91836	R0.7	1.4	4	1	16	50	1.35	3.67	16.61	17.17	17.76	18.40	19.84
HPI91015	R0.75	1.5	4	1.1	3	45	1.45	10.11	3.17	3.26	3.35	3.44	3.66
HPI91837	R0.75	1.5	4	1.1	4	45	1.45	8.87	4.21	4.33	4.46	4.59	4.91
HPI91838	R0.75	1.5	4	1.1	6	45	1.45	7.12	6.27	6.47	6.67	6.89	7.39
HPI91839	R0.75	1.5	4	1.1	8	45	1.45	5.94	8.34	8.61	8.89	9.19	9.88
HPI91840	R0.75	1.5	4	1.1	10	45	1.45	5.10	10.41	10.74	11.11	11.49	12.37
HPI91841	R0.75	1.5	4	1.1	12	45	1.45	4.46	12.48	12.88	13.32	13.79	14.85
HPI91842	R0.75	1.5	4	1.1	14	50	1.45	3.97	14.54	15.02	15.54	16.09	17.34
HPI91843	R0.75	1.5	4	1.1	16	50	1.45	3.57	16.61	17.16	17.76	18.39	19.82

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Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

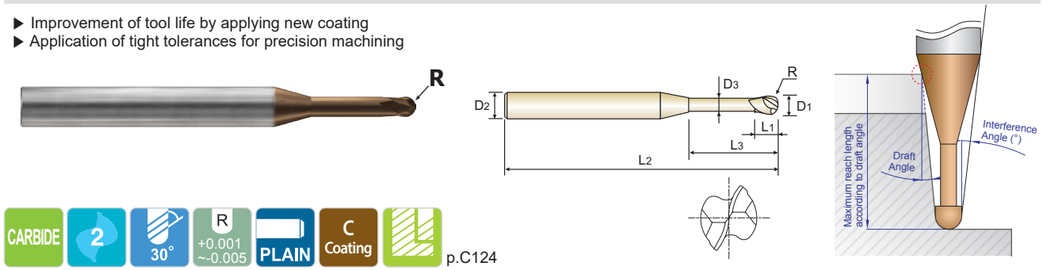
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

YG X1-EH END MILLS

PLAIN SHANK HPI91 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91844	R0.75	1.5	4	1.1	18	55	1.45	3.25	18.68	19.30	19.97	20.69	22.31
HPI91845	R0.75	1.5	4	1.1	20	55	1.45	2.98	20.74	21.44	22.19	22.99	-
HPI91846	R0.75	1.5	4	1.1	22	60	1.45	2.75	22.81	23.58	24.41	25.29	-
HPI91847	R0.75	1.5	4	1.1	30	70	1.45	2.10	31.08	32.14	33.27	34.49	-
HPI91848	R0.75	1.5	4	1.5	3.8	40	1.45	9.10	4.00	4.11	4.23	4.36	4.66
HPI91849	R0.75	1.5	4	1.5	3.8	50	1.45	9.10	4.00	4.11	4.23	4.36	4.66
HPI91850	R0.75	1.5	6	1.1	6	50	1.45	9.30	6.27	6.47	6.67	6.89	7.39
HPI91851	R0.75	1.5	6	1.1	8	50	1.45	8.13	8.34	8.61	8.89	9.19	9.88
HPI91852	R0.75	1.5	6	1.5	3.8	50	1.45	11.03	4.00	4.11	4.23	4.36	4.66
HPI91016	R0.8	1.6	4	1.2	8	45	1.55	5.82	8.34	8.60	8.88	9.19	9.87
HPI91853	R0.8	1.6	4	1.2	12	45	1.55	4.35	12.47	12.88	13.32	13.79	14.84
HPI91854	R0.8	1.6	4	1.2	16	50	1.55	3.47	16.61	17.16	17.75	18.39	19.81
HPI91855	R0.8	1.6	4	1.2	20	55	1.55	2.89	20.74	21.44	22.18	22.98	-
HPI91020	R1.0	2.0	4	1.5	3	45	1.95	9.74	3.16	3.24	3.32	3.41	3.60
HPI91856	R1.0	2.0	4	1.5	4	45	1.95	8.34	4.20	4.31	4.43	4.56	4.85
HPI91857	R1.0	2.0	4	1.5	6	45	1.95	6.46	6.26	6.45	6.64	6.86	7.33
HPI91858	R1.0	2.0	4	1.5	8	45	1.95	5.28	8.33	8.59	8.86	9.16	9.82
HPI91859	R1.0	2.0	4	1.5	10	45	1.95	4.46	10.40	10.73	11.08	11.46	12.30
HPI91860	R1.0	2.0	4	1.5	12	45	1.95	3.86	12.47	12.87	13.29	13.76	14.79
HPI91861	R1.0	2.0	4	1.5	13	45	1.95	3.62	13.50	13.94	14.40	14.91	16.03
HPI91862	R1.0	2.0	4	1.5	14	50	1.95	3.40	14.53	15.01	15.51	16.06	17.28
HPI91863	R1.0	2.0	4	1.5	16	50	1.95	3.04	16.60	17.15	17.73	18.36	19.76
HPI91864	R1.0	2.0	4	1.5	18	55	1.95	2.75	18.67	19.28	19.94	20.65	-
HPI91865	R1.0	2.0	4	1.5	20	55	1.95	2.51	20.74	21.42	22.16	22.95	-
HPI91866	R1.0	2.0	4	1.5	22	60	1.95	2.31	22.80	23.56	24.38	25.25	-
HPI91867	R1.0	2.0	4	1.5	25	65	1.95	2.06	25.90	26.77	27.70	28.70	-

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Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

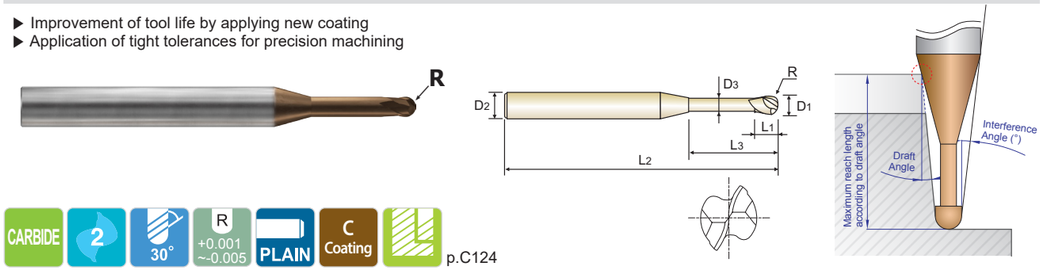
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

YG X1-EH END MILLS

PLAIN SHANK **HPI91 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91868	R1.0	2.0	4	1.5	30	70	1.95	1.74	31.07	32.12	33.24	-	-
HPI91869	R1.0	2.0	4	1.5	35	70	1.95	1.51	36.24	37.47	38.79	-	-
HPI91870	R1.0	2.0	4	1.5	40	90	1.95	1.34	41.41	42.82	-	-	-
HPI91871	R1.0	2.0	4	2	5	40	1.95	7.28	5.23	5.38	5.54	5.71	6.09
HPI91872	R1.0	2.0	4	2	5	50	1.95	7.28	5.23	5.38	5.54	5.71	6.09
HPI91873	R1.0	2.0	6	1.5	4	50	1.95	10.73	4.20	4.31	4.43	4.56	4.85
HPI91874	R1.0	2.0	6	1.5	6	50	1.95	9.05	6.26	6.45	6.64	6.86	7.33
HPI91875	R1.0	2.0	6	1.5	8	50	1.95	7.82	8.33	8.59	8.86	9.16	9.82
HPI91876	R1.0	2.0	6	1.5	10	50	1.95	6.89	10.40	10.73	11.08	11.46	12.30
HPI91877	R1.0	2.0	6	1.5	16	60	1.95	5.07	16.60	17.15	17.73	18.36	19.76
HPI91878	R1.0	2.0	6	1.5	25	65	1.95	3.63	25.90	26.77	27.70	28.70	30.95
HPI91879	R1.0	2.0	6	2	5	50	1.95	9.82	5.23	5.38	5.54	5.71	6.09
HPI91025	R1.25	2.5	4	2.3	6	45	2.4	5.54	6.35	6.53	6.72	6.93	7.39
HPI91880	R1.25	2.5	4	2.3	8	45	2.4	4.41	8.42	8.67	8.94	9.23	9.87
HPI91881	R1.25	2.5	4	2.3	10	45	2.4	3.66	10.49	10.81	11.15	11.53	12.36
HPI91882	R1.25	2.5	4	2.3	15	50	2.4	2.57	15.66	16.16	16.70	17.28	-
HPI91883	R1.25	2.5	4	2.3	20	55	2.4	1.98	20.82	21.51	22.24	-	-
HPI91884	R1.25	2.5	4	2.3	25	65	2.4	1.61	25.99	26.85	27.78	-	-
HPI91885	R1.25	2.5	4	2.3	30	70	2.4	1.35	31.16	32.20	-	-	-
HPI91886	R1.25	2.5	4	2.3	35	70	2.4	1.17	36.33	37.55	-	-	-
HPI91030	R1.5	3.0	4	3	8	40	2.85	3.31	8.51	8.75	9.01	9.30	9.93
HPI91887	R1.5	3.0	6	2.5	6	60	2.85	8.22	6.44	6.61	6.80	7.00	7.44
HPI91888	R1.5	3.0	6	2.5	8	60	2.85	6.91	8.51	8.75	9.01	9.30	9.93
HPI91889	R1.5	3.0	6	2.5	10	60	2.85	5.96	10.58	10.89	11.23	11.60	12.41
HPI91890	R1.5	3.0	6	2.5	12	60	2.85	5.23	12.64	13.03	13.45	13.90	14.90
HPI91891	R1.5	3.0	6	2.5	14	60	2.85	4.67	14.71	15.17	15.66	16.20	17.39

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Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

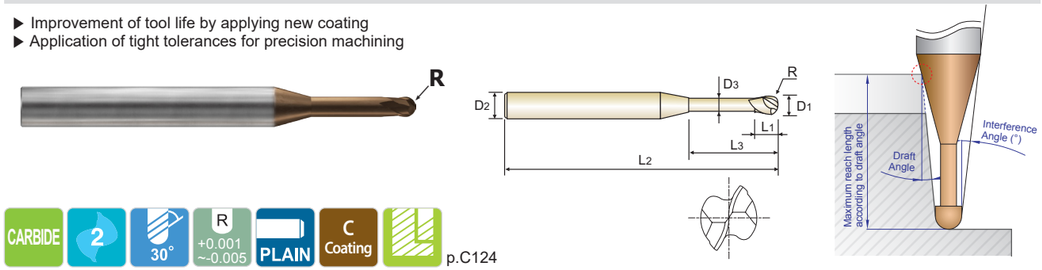
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

YG X1-EH END MILLS

PLAIN SHANK HPI91 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91892	R1.5	3.0	6	2.5	16	60	2.85	4.21	16.78	17.31	17.88	18.49	19.87
HPI91893	R1.5	3.0	6	2.5	20	65	2.85	3.52	20.91	21.59	22.31	23.09	24.85
HPI91894	R1.5	3.0	6	2.5	25	65	2.85	2.92	26.08	26.94	27.86	28.84	-
HPI91895	R1.5	3.0	6	2.5	30	70	2.85	2.50	31.25	32.29	33.40	34.59	-
HPI91896	R1.5	3.0	6	2.5	35	80	2.85	2.18	36.42	37.63	38.94	40.34	-
HPI91897	R1.5	3.0	6	2.5	40	90	2.85	1.94	41.59	42.98	44.48	-	-
HPI91898	R1.5	3.0	6	3	8	60	2.85	6.91	8.51	8.75	9.01	9.30	9.93
HPI91035	R1.75	3.5	6	2.8	15	60	3.35	3.93	15.74	16.22	16.75	17.31	18.57
HPI91899	R1.75	3.5	6	2.8	20	65	3.35	3.08	20.90	21.57	22.29	23.06	24.79
HPI91701	R1.75	3.5	6	2.8	25	65	3.35	2.54	26.07	26.92	27.83	28.81	-
HPI91702	R1.75	3.5	6	2.8	30	70	3.35	2.16	31.24	32.27	33.37	34.56	-
HPI91703	R1.75	3.5	6	2.8	35	80	3.35	1.87	36.41	37.62	38.91	-	-
HPI91704	R1.75	3.5	6	2.8	40	90	3.35	1.66	41.58	42.96	44.45	-	-
HPI91705	R1.75	3.5	6	2.8	45	90	3.35	1.49	46.75	48.31	-	-	-
HPI91040	R2.0	4.0	4	3	8	65	3.85	0.00	-	-	-	-	-
HPI91706	R2.0	4.0	6	3	8	65	3.85	5.70	8.49	8.72	8.96	9.22	9.81
HPI91707	R2.0	4.0	6	3	10	65	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91708	R2.0	4.0	6	3	12	65	3.85	4.08	12.63	13.00	13.39	13.82	14.78
HPI91709	R2.0	4.0	6	3	14	65	3.85	3.57	14.69	15.14	15.61	16.12	17.27
HPI91710	R2.0	4.0	6	3	15	65	3.85	3.36	15.73	16.21	16.72	17.27	18.51
HPI91711	R2.0	4.0	6	3	20	65	3.85	2.60	20.90	21.55	22.26	23.02	-
HPI91712	R2.0	4.0	6	3	25	70	3.85	2.12	26.06	26.90	27.80	28.77	-
HPI91713	R2.0	4.0	6	3	30	70	3.85	1.79	31.23	32.25	33.34	-	-
HPI91714	R2.0	4.0	6	3	35	80	3.85	1.55	36.40	37.60	38.88	-	-
HPI91715	R2.0	4.0	6	3	40	85	3.85	1.36	41.57	42.95	-	-	-
HPI91716	R2.0	4.0	6	3	45	90	3.85	1.22	46.74	48.30	-	-	-

▶NEXT PAGE

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

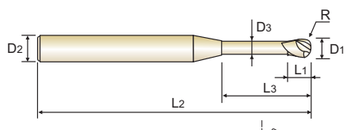
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

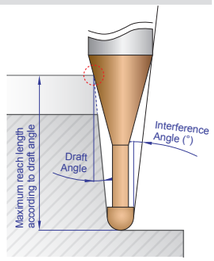
X1-EH END MILLS

PLAIN SHANK **HPI91** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | PLAIN | C Coating | p.C124

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI91717	R2.0	**4.0**	6	3	50	100	3.85	1.10	51.91	53.64	-	-	-
HPI91718	R2.0	**4.0**	6	4	10	40	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91719	R2.0	**4.0**	6	4	10	60	3.85	4.76	10.56	10.86	11.18	11.52	12.29
HPI91050	R2.5	**5.0**	6	3.5	10	70	4.85	2.97	10.54	10.82	11.12	11.45	-
HPI91720	R2.5	**5.0**	6	3.5	15	70	4.85	1.96	15.71	16.17	16.66	-	-
HPI91721	R2.5	**5.0**	6	3.5	20	70	4.85	1.46	20.88	21.52	-	-	-
HPI91722	R2.5	**5.0**	6	3.5	25	70	4.85	1.16	26.05	26.87	-	-	-
HPI91723	R2.5	**5.0**	6	3.5	30	80	4.85	0.97	31.22	-	-	-	-
HPI91724	R2.5	**5.0**	6	3.5	40	90	4.85	0.72	41.55	-	-	-	-
HPI91725	R2.5	**5.0**	6	5	12	45	4.85	2.46	12.61	12.96	13.34	13.75	-
HPI91726	R2.5	**5.0**	6	5	12	60	4.85	2.46	12.61	12.96	13.34	13.75	-
HPI91060	R3.0	**6.0**	6	6	10	70	5.85	0.00	-	-	-	-	-
HPI91727	R3.0	**6.0**	6	6	15	45	5.85	0.00	-	-	-	-	-
HPI91728	R3.0	**6.0**	6	6	15	60	5.85	0.00	-	-	-	-	-
HPI91729	R3.0	**6.0**	6	6	15	70	5.85	0.00	-	-	-	-	-
HPI91730	R3.0	**6.0**	6	6	20	70	5.85	0.00	-	-	-	-	-
HPI91731	R3.0	**6.0**	6	6	25	70	5.85	0.00	-	-	-	-	-
HPI91732	R3.0	**6.0**	6	6	30	80	5.85	0.00	-	-	-	-	-
HPI91733	R3.0	**6.0**	6	6	35	85	5.85	0.00	-	-	-	-	-
HPI91734	R3.0	**6.0**	6	6	40	90	5.85	0.00	-	-	-	-	-
HPI91735	R3.0	**6.0**	6	6	50	120	5.85	0.00	-	-	-	-	-
HPI91736	R3.0	**6.0**	6	6	60	120	5.85	0.00	-	-	-	-	-

Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
+0.001~-0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P																	M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20				
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21				
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230				
Recommended					○			○	○		○	○														

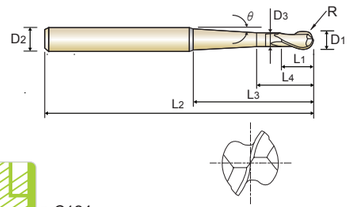
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

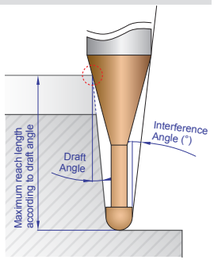
X1-EH END MILLS

PLAIN SHANK **HPI92** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92001	R0.05	**0.1**	4	0.07	0.5	50	0.085	**3°**	0.17	14.23	0.37	0.44	0.51	0.53	0.56
HPI92901	R0.05	**0.1**	4	0.07	0.75	50	0.085	**3°**	0.17	13.88	0.37	0.44	0.58	0.76	0.81
HPI920015	R0.075	**0.15**	4	0.1	1	50	0.135	**3°**	0.25	13.55	0.46	0.55	0.71	1.00	1.08
HPI92902	R0.075	**0.15**	4	0.1	1.5	50	0.135	**3°**	0.25	12.92	0.46	0.55	0.71	1.03	1.58
HPI92002	R0.1	**0.2**	4	0.15	1.5	50	0.17	**0.5°**	0.35	12.59	1.57	1.62	1.67	1.73	1.86
HPI92903	R0.1	**0.2**	4	0.15	1.5	50	0.17	**1°**	0.35	12.64	1.53	1.58	1.63	1.69	1.82
HPI92904	R0.1	**0.2**	4	0.15	1.5	50	0.17	**1.5°**	0.35	12.69	1.33	1.54	1.59	1.64	1.77
HPI92905	R0.1	**0.2**	4	0.15	1.5	50	0.17	**2°**	0.35	12.75	1.01	1.46	1.55	1.60	1.72
HPI92906	R0.1	**0.2**	4	0.15	2	50	0.17	**0.5°**	0.35	11.93	2.07	2.13	2.21	2.29	2.46
HPI92907	R0.1	**0.2**	4	0.15	2	50	0.17	**1°**	0.35	12.00	2.01	2.08	2.15	2.23	2.40
HPI92908	R0.1	**0.2**	4	0.15	2	50	0.17	**1.5°**	0.35	12.07	1.33	2.02	2.09	2.16	2.33
HPI92909	R0.1	**0.2**	4	0.15	2	50	0.17	**2°**	0.35	12.14	1.01	1.46	2.03	2.10	2.26
HPI92910	R0.1	**0.2**	4	0.15	3	50	0.17	**3°**	0.35	11.28	0.74	0.90	1.17	1.71	3.13
HPI92911	R0.1	**0.2**	4	0.15	3	50	0.17	**5°**	0.35	11.69	0.57	0.63	0.70	0.80	1.15
HPI92912	R0.1	**0.2**	4	0.15	5	50	0.17	**3°**	0.35	9.68	0.74	0.90	1.17	1.71	5.13
HPI92913	R0.1	**0.2**	4	0.15	5	50	0.17	**5°**	0.35	10.23	0.57	0.63	0.70	0.80	1.15
HPI92003	R0.15	**0.3**	4	0.2	2	50	0.27	**0.5°**	0.5	11.92	2.07	2.14	2.21	2.29	2.46
HPI92914	R0.15	**0.3**	4	0.2	2	50	0.27	**1°**	0.5	11.99	2.02	2.08	2.15	2.23	2.40
HPI92915	R0.15	**0.3**	4	0.2	2	50	0.27	**1.5°**	0.5	12.05	1.53	2.03	2.10	2.17	2.34
HPI92916	R0.15	**0.3**	4	0.2	2	50	0.27	**2°**	0.5	12.12	1.19	1.71	2.05	2.12	2.28
HPI92917	R0.15	**0.3**	4	0.2	2	50	0.27	**3°**	0.5	12.26	0.91	1.10	1.42	2.00	2.15
HPI92918	R0.15	**0.3**	4	0.2	3	50	0.27	**0.5°**	0.5	10.77	3.07	3.17	3.28	3.40	3.66
HPI92919	R0.15	**0.3**	4	0.2	3	50	0.27	**1°**	0.5	10.86	2.57	3.08	3.19	3.30	3.56
HPI92920	R0.15	**0.3**	4	0.2	3	50	0.27	**1.5°**	0.5	10.95	1.53	2.92	3.10	3.21	3.46

▶NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P																	M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron				
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20				
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21				
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230				
Recommended					○			○	○		○	○														

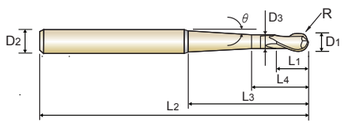
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

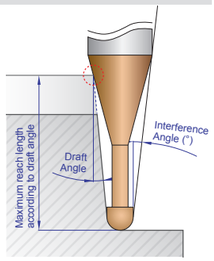
X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92921	R0.15	**0.3**	4	0.2	3	50	0.27	**2°**	0.5	11.04	1.19	1.71	3.01	3.12	3.36
HPI92922	R0.15	**0.3**	4	0.2	3	50	0.27	**3°**	0.5	11.23	0.91	1.10	1.42	2.06	3.15
HPI92923	R0.15	**0.3**	4	0.2	3	50	0.27	**5°**	0.5	11.62	0.73	0.80	0.89	1.02	1.45
HPI92924	R0.15	**0.3**	4	0.2	5	50	0.27	**3°**	0.5	9.61	0.91	1.10	1.42	2.06	5.15
HPI92925	R0.15	**0.3**	4	0.2	5	50	0.27	**5°**	0.5	10.14	0.73	0.80	0.89	1.02	1.45
HPI92926	R0.15	**0.3**	4	0.2	7	50	0.27	**3°**	0.5	8.39	0.91	1.10	1.42	2.06	7.15
HPI92927	R0.15	**0.3**	4	0.2	7	50	0.27	**5°**	0.5	8.99	0.73	0.80	0.89	1.02	1.45
HPI92004	R0.2	**0.4**	4	0.3	3	50	0.37	**0.5°**	0.7	10.73	3.07	3.17	3.28	3.40	3.66
HPI92928	R0.2	**0.4**	4	0.3	3	50	0.37	**1°**	0.7	10.81	2.92	3.09	3.20	3.31	3.56
HPI92929	R0.2	**0.4**	4	0.3	3	50	0.37	**1.5°**	0.7	10.90	1.81	3.01	3.12	3.23	3.47
HPI92930	R0.2	**0.4**	4	0.3	3	50	0.37	**2°**	0.7	10.98	1.44	2.06	3.03	3.14	3.38
HPI92931	R0.2	**0.4**	4	0.3	4	50	0.37	**0.5°**	0.7	9.76	4.07	4.21	4.35	4.51	4.86
HPI92932	R0.2	**0.4**	4	0.3	4	50	0.37	**1°**	0.7	9.86	2.92	4.09	4.24	4.39	4.73
HPI92933	R0.2	**0.4**	4	0.3	4	50	0.37	**1.5°**	0.7	9.96	1.81	3.42	4.12	4.26	4.59
HPI92934	R0.2	**0.4**	4	0.3	4	50	0.37	**2°**	0.7	10.06	1.44	2.06	3.92	4.14	4.46
HPI92935	R0.2	**0.4**	4	0.3	5	50	0.37	**3°**	0.7	9.52	1.14	1.38	1.77	2.56	5.19
HPI92936	R0.2	**0.4**	4	0.3	5	50	0.37	**5°**	0.7	10.04	0.95	1.04	1.16	1.32	1.87
HPI92937	R0.2	**0.4**	4	0.3	6	50	0.37	**0.5°**	0.7	8.26	6.07	6.28	6.50	6.74	7.27
HPI92938	R0.2	**0.4**	4	0.3	6	50	0.37	**1°**	0.7	8.37	2.92	6.09	6.31	6.54	7.05
HPI92939	R0.2	**0.4**	4	0.3	6	50	0.37	**1.5°**	0.7	8.49	1.81	3.42	6.12	6.34	6.84
HPI92940	R0.2	**0.4**	4	0.3	6	50	0.37	**2°**	0.7	8.61	1.44	2.06	3.92	6.14	6.62
HPI92941	R0.2	**0.4**	4	0.3	7	50	0.37	**3°**	0.7	8.30	1.14	1.38	1.77	2.56	7.19
HPI92942	R0.2	**0.4**	4	0.3	7	50	0.37	**5°**	0.7	8.88	0.95	1.04	1.16	1.32	1.87
HPI92005	R0.25	**0.5**	4	0.35	4	50	0.45	**0.5°**	0.85	9.67	4.12	4.25	4.40	4.55	4.90

▶NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

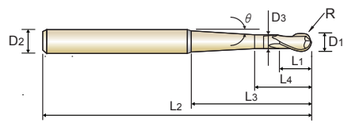
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

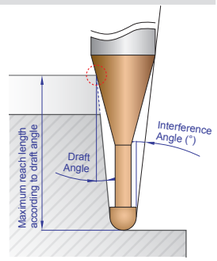
X1-EH END MILLS

PLAIN SHANK HPI92 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3	θ°	L4		0.5°	1°	1.5°	2°	3°
HPI92943	R0.25	**0.5**	4	0.35	4	50	0.45	**1°**	0.85	9.76	4.01	4.14	4.28	4.43	4.77
HPI92944	R0.25	**0.5**	4	0.35	4	50	0.45	**1.5°**	0.85	9.86	2.58	4.03	4.17	4.32	4.65
HPI92945	R0.25	**0.5**	4	0.35	4	50	0.45	**2°**	0.85	9.96	2.00	2.88	4.05	4.20	4.52
HPI92946	R0.25	**0.5**	4	0.35	5	50	0.45	**0.5°**	0.85	8.85	5.12	5.29	5.47	5.66	6.10
HPI92947	R0.25	**0.5**	4	0.35	5	50	0.45	**1°**	0.85	8.96	4.31	5.14	5.32	5.51	5.93
HPI92948	R0.25	**0.5**	4	0.35	5	50	0.45	**1.5°**	0.85	9.06	2.58	4.91	5.17	5.35	5.77
HPI92949	R0.25	**0.5**	4	0.35	5	50	0.45	**2°**	0.85	9.18	2.00	2.88	5.02	5.20	5.60
HPI92006	R0.3	**0.6**	4	0.45	4	50	0.55	**0.5°**	1.05	9.61	4.12	4.25	4.40	4.55	4.90
HPI92950	R0.3	**0.6**	4	0.45	4	50	0.55	**1°**	1.05	9.70	4.02	4.15	4.29	4.44	4.78
HPI92951	R0.3	**0.6**	4	0.45	4	50	0.55	**1.5°**	1.05	9.79	2.86	4.05	4.18	4.33	4.66
HPI92952	R0.3	**0.6**	4	0.45	4	50	0.55	**3°**	1.05	10.08	1.77	2.14	2.75	3.98	4.30
HPI92953	R0.3	**0.6**	4	0.45	5	50	0.55	**0.5°**	1.05	8.78	5.12	5.29	5.47	5.66	6.10
HPI92954	R0.3	**0.6**	4	0.45	5	50	0.55	**1°**	1.05	8.88	4.66	5.15	5.33	5.52	5.94
HPI92955	R0.3	**0.6**	4	0.45	5	50	0.55	**1.5°**	1.05	8.98	2.86	5.01	5.18	5.37	5.78
HPI92956	R0.3	**0.6**	4	0.45	5	50	0.55	**2°**	1.05	9.09	2.25	3.23	5.04	5.22	5.62
HPI92957	R0.3	**0.6**	4	0.45	5	50	0.55	**3°**	1.05	9.31	1.77	2.14	2.75	3.98	5.30
HPI92958	R0.3	**0.6**	4	0.45	5	50	0.55	**5°**	1.05	9.79	1.45	1.59	1.78	2.02	2.88
HPI92959	R0.3	**0.6**	4	0.45	6	50	0.55	**0.5°**	1.05	8.08	6.12	6.32	6.54	6.78	7.30
HPI92960	R0.3	**0.6**	4	0.45	6	50	0.55	**1°**	1.05	8.19	4.66	6.15	6.36	6.59	7.10
HPI92961	R0.3	**0.6**	4	0.45	6	50	0.55	**1.5°**	1.05	8.30	2.86	5.41	6.18	6.41	6.90
HPI92962	R0.3	**0.6**	4	0.45	6	50	0.55	**2°**	1.05	8.41	2.25	3.23	6.01	6.22	6.70
HPI92963	R0.3	**0.6**	4	0.45	7	50	0.55	**3°**	1.05	8.08	1.77	2.14	2.75	3.98	7.30
HPI92964	R0.3	**0.6**	4	0.45	7	50	0.55	**5°**	1.05	8.63	1.45	1.59	1.78	2.02	2.88
HPI92965	R0.3	**0.6**	4	0.45	8	50	0.55	**0.5°**	1.05	6.97	8.12	8.39	8.69	9.00	9.71

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

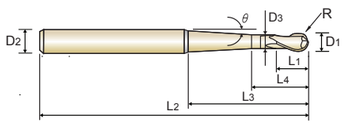
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

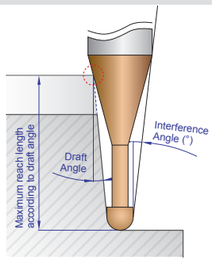
X1-EH END MILLS

PLAIN SHANK **HPI92** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92966	R0.3	**0.6**	4	0.45	8	50	0.55	**1°**	1.05	7.08	4.66	8.15	8.44	8.74	9.43
HPI92967	R0.3	**0.6**	4	0.45	8	50	0.55	**1.5°**	1.05	7.20	2.86	5.41	8.18	8.48	9.14
HPI92968	R0.3	**0.6**	4	0.45	8	50	0.55	**2°**	1.05	7.32	2.25	3.23	6.16	8.22	8.86
HPI92008	R0.4	**0.8**	4	0.6	8	60	0.75	**0.5°**	1.4	6.78	8.13	8.40	8.69	9.00	9.70
HPI92969	R0.4	**0.8**	4	0.6	8	60	0.75	**1°**	1.4	6.89	5.26	8.17	8.45	8.75	9.43
HPI92970	R0.4	**0.8**	4	0.6	8	60	0.75	**1.5°**	1.4	7.01	3.33	6.26	8.21	8.50	9.16
HPI92971	R0.4	**0.8**	4	0.6	8	60	0.75	**2°**	1.4	7.12	2.69	3.83	7.26	8.26	8.89
HPI92972	R0.4	**0.8**	4	0.6	12	60	0.75	**0.5°**	1.4	5.28	12.13	12.54	12.98	13.45	14.51
HPI92973	R0.4	**0.8**	4	0.6	12	60	0.75	**1°**	1.4	5.38	5.26	12.17	12.59	13.05	14.08
HPI92974	R0.4	**0.8**	4	0.6	12	60	0.75	**1.5°**	1.4	5.50	3.33	6.26	12.21	12.65	13.65
HPI92975	R0.4	**0.8**	4	0.6	12	60	0.75	**2°**	1.4	5.61	2.69	3.83	7.26	12.26	13.22
HPI92010	R0.5	**1.0**	4	0.75	6	60	0.95	**0.5°**	2.75	7.71	6.17	6.37	6.58	6.81	7.32
HPI92976	R0.5	**1.0**	4	0.75	6	60	0.95	**1°**	2.75	7.78	6.06	6.26	6.46	6.69	7.19
HPI92977	R0.5	**1.0**	4	0.75	6	60	0.95	**1.5°**	2.75	7.85	5.31	6.14	6.35	6.57	7.06
HPI92978	R0.5	**1.0**	4	0.75	8	60	0.95	**0.5°**	2.75	6.57	8.17	8.44	8.73	9.03	9.73
HPI92979	R0.5	**1.0**	4	0.75	8	60	0.95	**1°**	2.75	6.66	7.86	8.26	8.54	8.84	9.51
HPI92980	R0.5	**1.0**	4	0.75	8	60	0.95	**1.5°**	2.75	6.75	5.31	8.07	8.35	8.64	9.30
HPI92981	R0.5	**1.0**	4	0.75	8	60	0.95	**2°**	2.75	6.84	4.45	6.43	8.16	8.44	9.09
HPI92982	R0.5	**1.0**	4	0.75	10	60	0.95	**0.5°**	2.75	5.73	10.17	10.51	10.87	11.26	12.13
HPI92983	R0.5	**1.0**	4	0.75	10	60	0.95	**1°**	2.75	5.82	7.86	10.26	10.61	10.99	11.84
HPI92984	R0.5	**1.0**	4	0.75	10	60	0.95	**1.5°**	2.75	5.91	5.31	10.00	10.35	10.72	11.55
HPI92985	R0.5	**1.0**	4	0.75	10	60	0.95	**2°**	2.75	6.01	4.45	6.43	10.09	10.44	11.25
HPI92986	R0.5	**1.0**	4	0.75	10	60	0.95	**3°**	2.75	6.22	3.77	4.59	5.95	8.67	10.66
HPI92987	R0.5	**1.0**	4	0.75	12	60	0.95	**0.5°**	2.75	5.08	12.17	12.58	13.02	13.48	14.54

▶NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230	
Recommended					○			○	○		○	○										

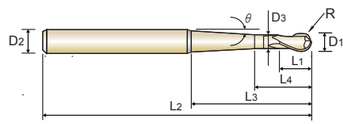
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

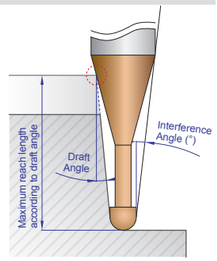
X1-EH END MILLS

PLAIN SHANK **HPI92** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92988	R0.5	**1.0**	4	0.75	12	60	0.95	**1°**	2.75	5.17	7.86	12.26	12.68	13.14	14.16
HPI92989	R0.5	**1.0**	4	0.75	12	60	0.95	**1.5°**	2.75	5.26	5.31	10.11	12.35	12.79	13.79
HPI92990	R0.5	**1.0**	4	0.75	16	60	0.95	**0.5°**	2.75	4.13	16.17	16.72	17.30	17.93	19.35
HPI92991	R0.5	**1.0**	4	0.75	16	60	0.95	**1°**	2.75	4.22	7.86	16.26	16.83	17.44	18.81
HPI92992	R0.5	**1.0**	4	0.75	16	60	0.95	**1.5°**	2.75	4.31	5.31	10.11	16.35	16.94	18.28
HPI92993	R0.5	**1.0**	4	0.75	20	70	0.95	**0.5°**	2.75	3.49	20.17	20.86	21.59	22.38	24.16
HPI92994	R0.5	**1.0**	4	0.75	20	70	0.95	**1°**	2.75	3.57	7.86	20.26	20.97	21.74	23.46
HPI92995	R0.5	**1.0**	4	0.75	20	70	0.95	**1.5°**	2.75	3.65	5.31	10.11	20.35	21.09	22.76
HPI92996	R0.5	**1.0**	4	0.75	20	70	0.95	**2°**	2.75	3.74	4.45	6.43	12.36	20.44	22.06
HPI92997	R0.5	**1.0**	4	0.75	20	70	0.95	**3°**	2.75	3.93	3.77	4.59	5.95	8.67	20.66
HPI92998	R0.5	**1.0**	4	0.75	25	70	0.95	**0.5°**	2.75	2.91	25.17	26.03	26.95	27.95	-
HPI92999	R0.5	**1.0**	4	0.75	25	70	0.95	**1°**	2.75	2.99	7.86	25.26	26.15	27.11	-
HPI92801	R0.5	**1.0**	4	0.75	25	70	0.95	**1.5°**	2.75	3.06	5.31	10.11	25.35	26.28	28.37
HPI92802	R0.5	**1.0**	4	0.75	30	70	0.95	**0.5°**	2.75	2.50	30.17	31.21	32.31	33.51	-
HPI92803	R0.5	**1.0**	4	0.75	30	70	0.95	**1°**	2.75	2.57	7.86	30.26	31.33	32.49	-
HPI92804	R0.5	**1.0**	4	0.75	30	70	0.95	**1.5°**	2.75	2.64	5.31	10.11	30.35	31.47	-
HPI92805	R0.5	**1.0**	4	0.75	30	70	0.95	**2°**	2.75	2.71	4.45	6.43	12.36	30.44	-
HPI92896	R0.5	**1.0**	6	0.75	30	70	0.95	**3°**	2.75	4.26	3.77	4.59	5.95	8.67	30.66
HPI92015	R0.75	**1.5**	4	1.1	10	60	1.45	**0.5°**	3.1	5.18	10.18	10.50	10.86	11.24	12.09
HPI92806	R0.75	**1.5**	4	1.1	10	60	1.45	**1°**	3.1	5.27	8.31	10.26	10.61	10.98	11.81
HPI92807	R0.75	**1.5**	4	1.1	10	60	1.45	**1.5°**	3.1	5.36	5.71	10.02	10.36	10.72	11.53
HPI92808	R0.75	**1.5**	4	1.1	10	60	1.45	**2°**	3.1	5.45	4.84	6.88	10.11	10.46	11.25
HPI92809	R0.75	**1.5**	4	1.1	15	60	1.45	**0.5°**	3.1	3.84	15.18	15.68	16.22	16.80	18.10
HPI92810	R0.75	**1.5**	4	1.1	15	60	1.45	**1°**	3.1	3.92	8.31	15.26	15.79	16.35	17.62

▶NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230	
Recommended					○			○	○		○	○										

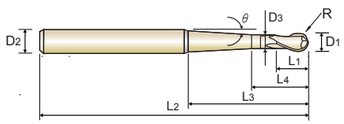
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

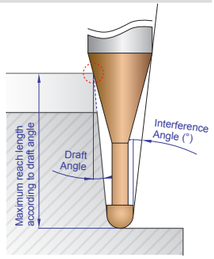
X1-EH END MILLS

PLAIN SHANK **HPI92** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92811	R0.75	**1.5**	4	1.1	15	60	1.45	**1.5°**	3.1	4.01	5.71	10.66	15.36	15.91	17.14
HPI92812	R0.75	**1.5**	4	1.1	15	60	1.45	**2°**	3.1	4.10	4.84	6.88	13.01	15.46	16.65
HPI92813	R0.75	**1.5**	4	1.1	20	70	1.45	**0.5°**	3.1	3.05	20.18	20.85	21.58	22.36	24.11
HPI92814	R0.75	**1.5**	4	1.1	20	70	1.45	**1°**	3.1	3.12	8.31	20.26	20.97	21.73	23.43
HPI92815	R0.75	**1.5**	4	1.1	20	70	1.45	**1.5°**	3.1	3.20	5.71	10.66	20.36	21.09	22.74
HPI92816	R0.75	**1.5**	4	1.1	20	70	1.45	**2°**	3.1	3.28	4.84	6.88	13.01	20.46	22.06
HPI92817	R0.75	**1.5**	4	1.1	25	70	1.45	**0.5°**	3.1	2.53	25.18	26.03	26.94	27.92	-
HPI92818	R0.75	**1.5**	4	1.1	25	70	1.45	**1°**	3.1	2.59	8.31	25.26	26.15	27.10	-
HPI92819	R0.75	**1.5**	4	1.1	30	70	1.45	**0.5°**	3.1	2.16	30.18	31.20	32.30	33.48	-
HPI92820	R0.75	**1.5**	4	1.1	30	70	1.45	**1°**	3.1	2.22	8.31	30.26	31.33	32.48	-
HPI92020	R1.0	**2.0**	4	1.5	12	60	1.95	**0.5°**	3.5	3.93	12.18	12.57	12.99	13.44	14.45
HPI92821	R1.0	**2.0**	4	1.5	12	60	1.95	**1°**	3.5	4.01	8.86	12.27	12.68	13.12	14.10
HPI92822	R1.0	**2.0**	4	1.5	12	60	1.95	**1.5°**	3.5	4.09	6.18	11.36	12.37	12.80	13.76
HPI92823	R1.0	**2.0**	4	1.5	12	60	1.95	**2°**	3.5	4.17	5.29	7.43	12.07	12.48	13.41
HPI92824	R1.0	**2.0**	4	1.5	16	60	1.95	**0.5°**	3.5	3.11	16.18	16.71	17.28	17.89	19.26
HPI92825	R1.0	**2.0**	4	1.5	16	60	1.95	**1°**	3.5	3.18	8.86	16.27	16.83	17.42	18.75
HPI92826	R1.0	**2.0**	4	1.5	16	60	1.95	**1.5°**	3.5	3.25	6.18	11.36	16.37	16.95	18.24
HPI92827	R1.0	**2.0**	4	1.5	16	60	1.95	**2°**	3.5	3.33	5.29	7.43	13.86	16.48	17.74
HPI92828	R1.0	**2.0**	4	1.5	20	70	1.95	**0.5°**	3.5	2.57	20.18	20.85	21.57	22.34	-
HPI92829	R1.0	**2.0**	4	1.5	20	70	1.95	**1°**	3.5	2.63	8.86	20.27	20.97	21.72	-
HPI92830	R1.0	**2.0**	4	1.5	20	70	1.95	**1.5°**	3.5	2.70	6.18	11.36	20.37	21.10	-
HPI92831	R1.0	**2.0**	4	1.5	20	70	1.95	**2°**	3.5	2.77	5.29	7.43	13.86	20.48	-
HPI92832	R1.0	**2.0**	4	1.5	25	70	1.95	**0.5°**	3.5	2.11	25.18	26.02	26.93	27.90	-
HPI92833	R1.0	**2.0**	4	1.5	25	70	1.95	**1°**	3.5	2.17	8.86	25.27	26.15	27.09	-

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Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

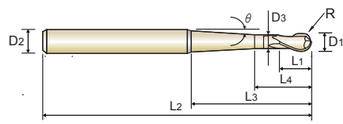
ISO	N									S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

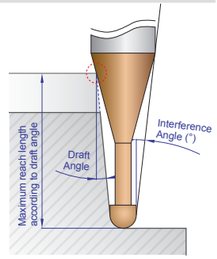
X1-EH END MILLS

PLAIN SHANK HPI92 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92834	R1.0	**2.0**	4	1.5	25	70	1.95	**1.5°**	3.5	2.23	6.18	11.36	25.37	26.29	-
HPI92835	R1.0	**2.0**	4	1.5	30	70	1.95	**0.5°**	3.5	1.79	30.18	31.20	32.29	-	-
HPI92836	R1.0	**2.0**	4	1.5	30	70	1.95	**1°**	3.5	1.84	8.86	30.27	31.33	-	-
HPI92837	R1.0	**2.0**	4	1.5	35	80	1.95	**0.5°**	3.5	1.56	35.18	36.37	37.65	-	-
HPI92838	R1.0	**2.0**	4	1.5	40	80	1.95	**0.5°**	3.5	1.38	40.18	41.55	-	-	-
HPI92839	R1.0	**2.0**	4	1.5	50	90	1.95	**0.5°**	3.5	1.12	50.18	51.89	-	-	-
HPI92840	R1.0	**2.0**	6	1.5	25	70	1.95	**2°**	3.5	3.98	5.29	7.43	13.86	25.48	27.47
HPI92841	R1.0	**2.0**	6	1.5	30	70	1.95	**1.5°**	3.5	3.37	6.18	11.36	30.37	31.48	33.95
HPI92842	R1.0	**2.0**	6	1.5	30	70	1.95	**2°**	3.5	3.46	5.29	7.43	13.86	30.48	32.87
HPI92843	R1.0	**2.0**	6	1.5	35	80	1.95	**1°**	3.5	2.90	8.86	35.27	36.51	37.84	-
HPI92844	R1.0	**2.0**	6	1.5	35	80	1.95	**1.5°**	3.5	2.98	6.18	11.36	35.37	36.66	-
HPI92845	R1.0	**2.0**	6	1.5	40	80	1.95	**1°**	3.5	2.59	8.86	40.27	41.69	43.22	-
HPI92846	R1.0	**2.0**	6	1.5	40	80	1.95	**1.5°**	3.5	2.66	6.18	11.36	40.37	41.85	-
HPI92847	R1.0	**2.0**	6	1.5	40	80	1.95	**2°**	3.5	2.74	5.29	7.43	13.86	40.48	-
HPI92848	R1.0	**2.0**	6	1.5	50	90	1.95	**1°**	3.5	2.14	8.86	50.27	52.05	53.97	-
HPI92849	R1.0	**2.0**	6	1.5	50	90	1.95	**1.5°**	3.5	2.20	6.18	11.36	50.37	52.22	-
HPI92850	R1.0	**2.0**	6	1.5	50	90	1.95	**2°**	3.5	2.27	5.29	7.43	13.86	50.48	-
HPI92030	R1.5	**3.0**	6	2.5	15	70	2.85	**0.5°**	4.5	4.51	15.39	15.87	16.39	16.95	18.21
HPI92851	R1.5	**3.0**	6	2.5	15	70	2.85	**1°**	4.5	4.59	15.04	15.51	16.01	16.56	17.78
HPI92852	R1.5	**3.0**	6	2.5	15	70	2.85	**1.5°**	4.5	4.67	10.30	15.14	15.64	16.17	17.35
HPI92853	R1.5	**3.0**	6	2.5	15	70	2.85	**2°**	4.5	4.76	8.36	11.79	15.26	15.77	16.93
HPI92854	R1.5	**3.0**	6	2.5	20	70	2.85	**0.5°**	4.5	3.60	20.39	21.05	21.75	22.51	24.22
HPI92855	R1.5	**3.0**	6	2.5	20	70	2.85	**1°**	4.5	3.67	16.09	20.51	21.19	21.93	23.59
HPI92856	R1.5	**3.0**	6	2.5	20	70	2.85	**1.5°**	4.5	3.75	10.30	19.09	20.64	21.35	22.96

▶NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

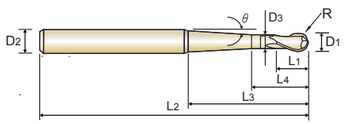
ISO	N									S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

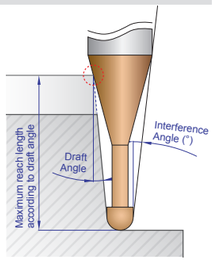
X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92857	R1.5	**3.0**	6	2.5	20	70	2.85	**2°**	4.5	3.84	8.36	11.79	20.08	20.77	22.33
HPI92858	R1.5	**3.0**	6	2.5	25	70	2.85	**0.5°**	4.5	2.99	25.39	26.22	27.12	28.08	-
HPI92859	R1.5	**3.0**	6	2.5	25	70	2.85	**1°**	4.5	3.06	16.09	25.51	26.38	27.31	29.40
HPI92860	R1.5	**3.0**	6	2.5	25	70	2.85	**1.5°**	4.5	3.14	10.30	19.09	25.64	26.54	28.57
HPI92861	R1.5	**3.0**	6	2.5	30	70	2.85	**0.5°**	4.5	2.56	30.39	31.40	32.48	33.64	-
HPI92862	R1.5	**3.0**	6	2.5	30	70	2.85	**1°**	4.5	2.63	16.09	30.51	31.56	32.68	-
HPI92863	R1.5	**3.0**	6	2.5	30	70	2.85	**1.5°**	4.5	2.69	10.30	19.09	30.64	31.73	-
HPI92864	R1.5	**3.0**	6	2.5	30	70	2.85	**2°**	4.5	2.77	8.36	11.79	22.08	30.77	-
HPI92865	R1.5	**3.0**	6	2.5	40	80	2.85	**0.5°**	4.5	1.99	40.39	41.75	43.20	-	-
HPI92866	R1.5	**3.0**	6	2.5	40	80	2.85	**1°**	4.5	2.04	16.09	40.51	41.92	43.43	-
HPI92867	R1.5	**3.0**	6	2.5	40	80	2.85	**1.5°**	4.5	2.10	10.30	19.09	40.64	42.10	-
HPI92868	R1.5	**3.0**	6	2.5	50	90	2.85	**0.5°**	4.5	1.62	50.39	52.09	53.92	-	-
HPI92869	R1.5	**3.0**	6	2.5	50	90	2.85	**1°**	4.5	1.67	16.09	50.51	52.28	-	-
HPI92870	R1.5	**3.0**	6	2.5	50	90	2.85	**1.5°**	4.5	1.72	10.30	19.09	50.64	-	-
HPI92040	R2.0	**4.0**	6	3	20	80	3.85	**1°**	5	2.72	16.59	20.51	21.18	21.90	-
HPI92871	R2.0	**4.0**	6	3	30	80	3.85	**1°**	5	1.89	16.59	30.51	31.54	-	-
HPI92872	R2.0	**4.0**	6	3	40	80	3.85	**1°**	5	1.44	16.59	40.51	-	-	-
HPI92873	R2.0	**4.0**	6	3	50	90	3.85	**1°**	5	1.17	16.59	50.51	-	-	-
HPI92874	R2.0	**4.0**	6	3	61.1	110	3.85	**1°**	5	0.96	16.59	-	-	-	-
HPI92897	R2.5	**5.0**	8	10	30	80	4.85	**1°**	13	2.66	30.07	31.03	32.06	33.17	-
HPI92898	R2.5	**5.0**	8	10	40	90	4.85	**1°**	13	2.06	32.09	41.03	42.42	43.92	-
HPI92899	R2.5	**5.0**	8	10	60	110	4.85	**1°**	13	1.42	32.09	61.03	-	-	-
HPI92701	R2.5	**5.0**	8	10	90	140	4.85	**1°**	13	0.97	32.09	-	-	-	-
HPI92702	R2.5	**5.0**	8	10	74	150	4.75	**1.5°**	13	1.20	25.41	48.31	-	-	-

▶NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

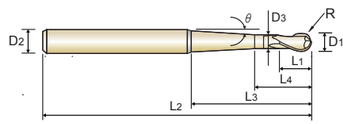
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

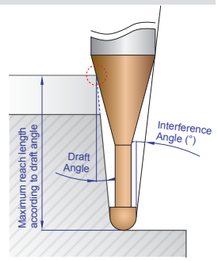
X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92703	R2.5	**5.0**	8	10	100	150	4.85	**0.5°**	13	0.85	100.64	-	-	-	-
HPI92704	R3.0	**6.0**	8	12	30	80	5.85	**1°**	15	1.91	30.19	31.14	32.15	-	-
HPI92705	R3.0	**6.0**	8	12	40	90	5.85	**1°**	15	1.45	35.59	41.14	-	-	-
HPI92706	R3.0	**6.0**	8	12	45	95	5.85	**1°**	15	1.30	35.59	46.14	-	-	-
HPI92707	R3.0	**6.0**	8	12	50	100	5.85	**1°**	15	1.18	35.59	51.14	-	-	-
HPI92708	R3.0	**6.0**	8	12	120	200	5.85	**0.5°**	15	0.49	-	-	-	-	-
HPI92709	R3.0	**6.0**	10	12	30	80	5.85	**3°**	15	3.60	19.11	23.14	29.84	30.99	33.27
HPI92710	R3.0	**6.0**	10	12	50	100	5.85	**1.5°**	15	2.23	25.29	47.58	51.61	53.43	-
HPI92711	R3.0	**6.0**	10	12	60	110	5.85	**1°**	15	1.85	35.59	61.14	63.24	-	-
HPI92712	R3.0	**6.0**	10	12	70	120	5.85	**1°**	15	1.61	35.59	71.14	73.60	-	-
HPI92713	R3.0	**6.0**	10	12	80	130	5.85	**1°**	15	1.42	35.59	81.14	-	-	-
HPI92714	R3.0	**6.0**	10	12	96	200	5.75	**1.5°**	15	1.23	28.16	53.31	-	-	-
HPI92715	R3.0	**6.0**	10	12	120	200	5.85	**1°**	15	0.97	35.59	-	-	-	-
HPI92070	R3.5	**7.0**	10	14	40	90	6.7	**3°**	17	2.25	23.13	28.03	36.20	40.94	-
HPI92875	R3.5	**7.0**	10	14	45	95	6.7	**1°**	17	1.87	45.09	46.54	48.09	-	-
HPI92876	R3.5	**7.0**	10	14	60	110	6.7	**1.5°**	17	1.47	32.34	60.04	-	-	-
HPI92080	R4.0	**8.0**	10	14	35	95	7.7	**3°**	17	1.80	23.03	27.78	35.08	-	-
HPI92877	R4.0	**8.0**	10	14	50	110	7.7	**1°**	17	1.19	47.18	51.50	-	-	-
HPI92878	R4.0	**8.0**	10	14	50	110	7.7	**1.5°**	17	1.22	32.09	50.35	-	-	-
HPI92879	R4.0	**8.0**	10	14	55	115	7.7	**1°**	17	1.08	47.18	56.50	-	-	-
HPI92880	R4.0	**8.0**	10	14	60	120	7.7	**1°**	17	1.00	47.18	-	-	-	-
HPI92881	R4.0	**8.0**	10	14	70	130	7.7	**1°**	17	0.86	47.18	-	-	-	-
HPI92882	R4.0	**8.0**	10	14	120	200	7.7	**0.5°**	17	0.49	-	-	-	-	-
HPI92883	R4.0	**8.0**	12	14	80	140	7.7	**1°**	17	1.43	47.18	81.50	-	-	-

▶NEXT PAGE

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

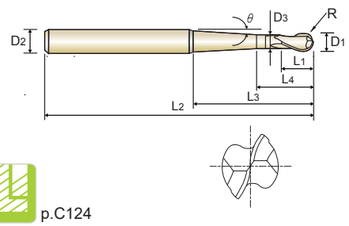
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

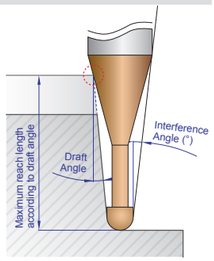
X1-EH END MILLS

PLAIN SHANK **HPI92 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING with TAPER NECK

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 30° | R +0.001 ~-0.005 | R +0.003 ~-0.007 | PLAIN | C Coating | p.C124

R0.05~R3 R3.5~R6

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Neck Taper Angle(°)	Under Neck Parallel Length	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3	θ°	L_4		0.5°	1°	1.5°	2°	3°
HPI92884	R4.0	**8.0**	12	14	98	200	7.7	**1.5°**	17	1.22	32.09	60.17	-	-	-
HPI92885	R4.0	**8.0**	12	14	120	200	7.7	**1°**	17	0.98	47.18	-	-	-	-
HPI92100	R5.0	**10.0**	12	18	35	105	9.7	**3°**	21	1.82	27.63	33.28	35.83	-	-
HPI92886	R5.0	**10.0**	12	18	55	125	9.7	**1.5°**	21	1.12	37.59	55.53	-	-	-
HPI92887	R5.0	**10.0**	12	18	60	130	9.7	**1°**	21	1.01	54.18	61.71	-	-	-
HPI92888	R5.0	**10.0**	12	18	65	135	9.7	**1°**	21	0.93	54.18	-	-	-	-
HPI92889	R5.0	**10.0**	12	18	75	140	9.7	**1°**	21	0.81	54.18	-	-	-	-
HPI92890	R5.0	**10.0**	12	18	86	200	9.7	**1°**	21	0.71	54.18	-	-	-	-
HPI92891	R5.0	**10.0**	12	18	120	200	9.7	**0.5°**	21	0.49	-	-	-	-	-
HPI92892	R5.0	**10.0**	16	18	120	200	9.7	**1.5°**	21	1.47	37.59	70.17	-	-	-
HPI92120	R6.0	**12.0**	16	22	60	140	11.7	**3°**	25	2.08	32.23	38.78	49.69	60.86	-
HPI92893	R6.0	**12.0**	16	22	80	160	11.7	**1.5°**	25	1.49	43.09	80.01	-	-	-
HPI92894	R6.0	**12.0**	16	22	106	200	11.7	**1.5°**	25	1.14	43.09	80.17	-	-	-
HPI92895	R6.0	**12.0**	16	22	120	200	11.7	**1°**	25	0.99	61.18	-	-	-	-

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	+0.001~-0.005	0~-0.010	h4
over R3	+0.003~-0.007	0~-0.012	* Shank Dia.>ø6 : h5

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

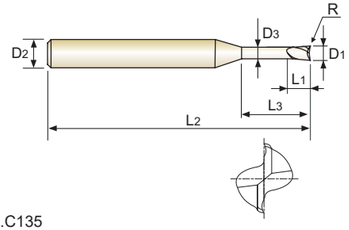
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

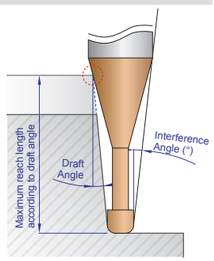
X1-EH END MILLS

PLAIN SHANK **HPI89 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C135

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI89002	R0.02	**0.2**	4	0.15	0.5	45	0.17	13.99	0.61	0.65	0.68	0.72	0.82
HPI89901	R0.05	**0.2**	4	0.15	0.5	45	0.17	14.04	0.61	0.64	0.68	0.72	0.81
HPI89902	R0.02	**0.2**	4	0.15	1	45	0.17	13.16	1.14	1.20	1.27	1.35	1.54
HPI89903	R0.05	**0.2**	4	0.15	1	45	0.17	13.21	1.14	1.20	1.27	1.34	1.52
HPI89904	R0.02	**0.2**	4	0.15	1.5	45	0.17	12.42	1.67	1.76	1.86	1.97	2.25
HPI89905	R0.05	**0.2**	4	0.15	1.5	45	0.17	12.46	1.66	1.75	1.85	1.96	2.23
HPI89906	R0.02	**0.2**	4	0.15	2	45	0.17	11.76	2.19	2.31	2.45	2.60	2.96
HPI89907	R0.05	**0.2**	4	0.15	2	45	0.17	11.80	2.19	2.31	2.44	2.59	2.95
HPI89003	R0.02	**0.3**	4	0.25	1	45	0.27	13.12	1.14	1.20	1.27	1.35	1.54
HPI89908	R0.05	**0.3**	4	0.25	1	45	0.27	13.16	1.14	1.20	1.27	1.34	1.52
HPI89909	R0.02	**0.3**	4	0.25	1.5	45	0.27	12.36	1.67	1.76	1.86	1.97	2.25
HPI89910	R0.05	**0.3**	4	0.25	1.5	45	0.27	12.41	1.66	1.75	1.85	1.96	2.23
HPI89911	R0.02	**0.3**	4	0.25	2	45	0.27	11.69	2.19	2.31	2.45	2.60	2.96
HPI89912	R0.05	**0.3**	4	0.25	2	45	0.27	11.73	2.19	2.31	2.44	2.59	2.95
HPI89913	R0.02	**0.3**	4	0.25	2.5	45	0.27	11.09	2.72	2.87	3.03	3.22	3.67
HPI89914	R0.05	**0.3**	4	0.25	2.5	45	0.27	11.12	2.72	2.86	3.03	3.21	3.66
HPI89915	R0.02	**0.3**	4	0.25	3	45	0.27	10.54	3.24	3.42	3.62	3.84	4.38
HPI89916	R0.05	**0.3**	4	0.25	3	45	0.27	10.57	3.24	3.42	3.61	3.83	4.37
HPI89004	R0.02	**0.4**	4	0.3	1	45	0.37	13.07	1.14	1.20	1.27	1.35	1.54
HPI89917	R0.05	**0.4**	4	0.3	1	45	0.37	13.12	1.14	1.20	1.27	1.34	1.52
HPI89918	R0.1	**0.4**	4	0.3	1	45	0.37	13.20	1.14	1.19	1.26	1.33	1.50
HPI89919	R0.02	**0.4**	4	0.3	1.5	45	0.37	12.30	1.67	1.76	1.86	1.97	2.25
HPI89920	R0.05	**0.4**	4	0.3	1.5	45	0.37	12.35	1.66	1.75	1.85	1.96	2.23
HPI89921	R0.02	**0.4**	4	0.3	2	45	0.37	11.62	2.19	2.31	2.45	2.60	2.96
HPI89922	R0.05	**0.4**	4	0.3	2	45	0.37	11.66	2.19	2.31	2.44	2.59	2.95
HPI89923	R0.1	**0.4**	4	0.3	2	45	0.37	11.72	2.19	2.30	2.43	2.58	2.92

▶NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

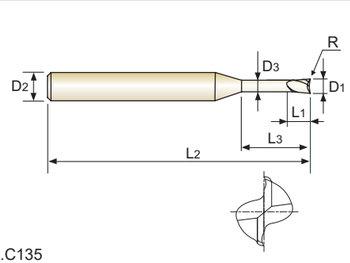
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

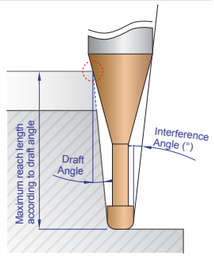
X1-EH END MILLS

PLAIN SHANK **HPI89 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C135

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89924	R0.02	**0.4**	4	0.3	2.5	45	0.37	11.01	2.72	2.87	3.03	3.22	3.67
HPI89925	R0.05	**0.4**	4	0.3	2.5	45	0.37	11.04	2.72	2.86	3.03	3.21	3.66
HPI89926	R0.02	**0.4**	4	0.3	3	45	0.37	10.46	3.24	3.42	3.62	3.84	4.38
HPI89927	R0.05	**0.4**	4	0.3	3	45	0.37	10.49	3.24	3.42	3.61	3.83	4.37
HPI89928	R0.1	**0.4**	4	0.3	3	45	0.37	10.54	3.24	3.41	3.61	3.82	4.35
HPI89929	R0.02	**0.4**	4	0.3	4	45	0.37	9.50	4.30	4.53	4.79	5.09	5.80
HPI89930	R0.05	**0.4**	4	0.3	4	45	0.37	9.53	4.30	4.53	4.79	5.08	5.79
HPI89931	R0.1	**0.4**	4	0.3	4	45	0.37	9.57	4.29	4.52	4.78	5.07	5.77
HPI89005	R0.02	**0.5**	4	0.4	1	45	0.45	12.96	1.20	1.27	1.34	1.42	1.62
HPI89932	R0.05	**0.5**	4	0.4	1	45	0.45	13.01	1.20	1.26	1.33	1.41	1.60
HPI89933	R0.1	**0.5**	4	0.4	1	45	0.45	13.09	1.20	1.26	1.32	1.40	1.58
HPI89934	R0.02	**0.5**	4	0.4	2	45	0.45	11.50	2.25	2.37	2.51	2.67	3.04
HPI89935	R0.05	**0.5**	4	0.4	2	45	0.45	11.54	2.25	2.37	2.51	2.66	3.03
HPI89936	R0.1	**0.5**	4	0.4	2	45	0.45	11.60	2.25	2.37	2.50	2.65	3.01
HPI89937	R0.02	**0.5**	4	0.4	3	45	0.45	10.33	3.30	3.48	3.69	3.91	4.46
HPI89938	R0.05	**0.5**	4	0.4	3	45	0.45	10.36	3.30	3.48	3.68	3.91	4.45
HPI89939	R0.1	**0.5**	4	0.4	3	45	0.45	10.41	3.30	3.48	3.67	3.89	4.43
HPI89940	R0.02	**0.5**	4	0.4	4	45	0.45	9.37	4.36	4.59	4.86	5.16	5.88
HPI89941	R0.05	**0.5**	4	0.4	4	45	0.45	9.40	4.35	4.59	4.86	5.15	5.87
HPI89942	R0.1	**0.5**	4	0.4	4	45	0.45	9.44	4.35	4.59	4.85	5.14	5.85
HPI89943	R0.02	**0.5**	4	0.4	5	45	0.45	8.58	5.41	5.70	6.04	6.41	7.31
HPI89944	R0.05	**0.5**	4	0.4	5	45	0.45	8.60	5.41	5.70	6.03	6.40	7.30
HPI89945	R0.1	**0.5**	4	0.4	5	45	0.45	8.63	5.40	5.70	6.02	6.39	7.27
HPI89946	R0.02	**0.5**	4	0.4	6	45	0.45	7.90	6.46	6.81	7.21	7.65	8.73
HPI89947	R0.05	**0.5**	4	0.4	6	45	0.45	7.92	6.46	6.81	7.20	7.65	8.72
HPI89948	R0.1	**0.5**	4	0.4	6	45	0.45	7.95	6.46	6.81	7.20	7.63	8.70

▶NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2		12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○										

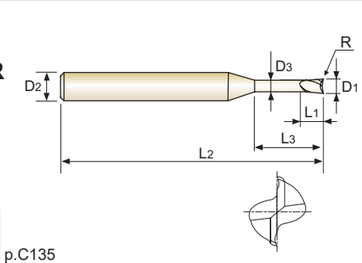
ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

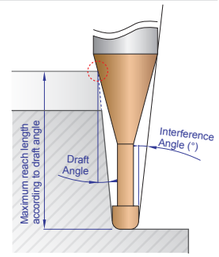
X1-EH END MILLS

PLAIN SHANK HPI89 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C135

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89006	R0.02	**0.6**	4	0.5	2	45	0.55	11.42	2.25	2.37	2.51	2.67	3.04
HPI89949	R0.05	**0.6**	4	0.5	2	45	0.55	11.46	2.25	2.37	2.51	2.66	3.03
HPI89950	R0.1	**0.6**	4	0.5	2	45	0.55	11.52	2.25	2.37	2.50	2.65	3.01
HPI89951	R0.02	**0.6**	4	0.5	4	45	0.55	9.27	4.36	4.59	4.86	5.16	5.88
HPI89952	R0.05	**0.6**	4	0.5	4	45	0.55	9.29	4.35	4.59	4.86	5.15	5.87
HPI89953	R0.1	**0.6**	4	0.5	4	45	0.55	9.34	4.35	4.59	4.85	5.14	5.85
HPI89954	R0.02	**0.6**	4	0.5	6	45	0.55	7.80	6.46	6.81	7.21	7.65	8.73
HPI89955	R0.05	**0.6**	4	0.5	6	45	0.55	7.81	6.46	6.81	7.20	7.65	8.72
HPI89956	R0.1	**0.6**	4	0.5	6	45	0.55	7.85	6.46	6.81	7.20	7.63	8.70
HPI89957	R0.02	**0.6**	4	0.5	8	50	0.55	6.72	8.56	9.03	9.56	10.15	11.41
HPI89958	R0.05	**0.6**	4	0.5	8	50	0.55	6.74	8.56	9.03	9.55	10.14	11.40
HPI89959	R0.1	**0.6**	4	0.5	8	50	0.55	6.76	8.56	9.03	9.54	10.13	11.39
HPI89960	R0.02	**0.6**	4	0.5	10	50	0.55	5.91	10.67	11.25	11.91	12.64	13.74
HPI89961	R0.05	**0.6**	4	0.5	10	50	0.55	5.92	10.67	11.25	11.90	12.63	13.74
HPI89962	R0.1	**0.6**	4	0.5	10	50	0.55	5.94	10.66	11.25	11.89	12.62	13.73
HPI89007	R0.02	**0.7**	4	0.55	2	45	0.65	11.34	2.25	2.37	2.51	2.67	3.04
HPI89963	R0.05	**0.7**	4	0.55	2	45	0.65	11.38	2.25	2.37	2.51	2.66	3.03
HPI89964	R0.1	**0.7**	4	0.55	2	45	0.65	11.44	2.25	2.37	2.50	2.65	3.01
HPI89965	R0.02	**0.7**	4	0.55	4	45	0.65	9.16	4.36	4.59	4.86	5.16	5.88
HPI89966	R0.05	**0.7**	4	0.55	4	45	0.65	9.19	4.35	4.59	4.86	5.15	5.87
HPI89967	R0.1	**0.7**	4	0.55	4	45	0.65	9.23	4.35	4.59	4.85	5.14	5.85
HPI89968	R0.02	**0.7**	4	0.55	6	45	0.65	7.68	6.46	6.81	7.21	7.65	8.73
HPI89969	R0.05	**0.7**	4	0.55	6	45	0.65	7.70	6.46	6.81	7.20	7.65	8.72
HPI89970	R0.1	**0.7**	4	0.55	6	45	0.65	7.73	6.46	6.81	7.20	7.63	8.70
HPI89008	R0.02	**0.8**	4	0.65	2	45	0.75	11.25	2.25	2.37	2.51	2.67	3.04
HPI89971	R0.05	**0.8**	4	0.65	2	45	0.75	11.29	2.25	2.37	2.51	2.66	3.03

▶NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2		12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○										

ISO	N									S							H					
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

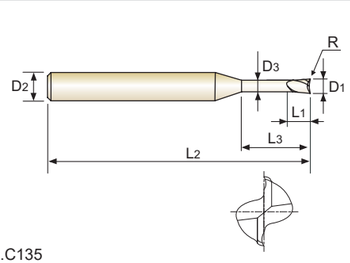
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

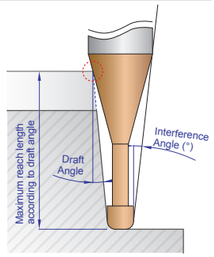
X1-EH END MILLS

PLAIN SHANK **HPI89** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C135

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89972	R0.1	**0.8**	4	0.65	2	45	0.75	11.36	2.25	2.37	2.50	2.65	3.01
HPI89973	R0.2	**0.8**	4	0.65	2	45	0.75	11.50	2.24	2.36	2.48	2.62	2.96
HPI89974	R0.02	**0.8**	4	0.65	4	45	0.75	9.05	4.36	4.59	4.86	5.16	5.88
HPI89975	R0.05	**0.8**	4	0.65	4	45	0.75	9.08	4.35	4.59	4.86	5.15	5.87
HPI89976	R0.1	**0.8**	4	0.65	4	45	0.75	9.12	4.35	4.59	4.85	5.14	5.85
HPI89977	R0.2	**0.8**	4	0.65	4	45	0.75	9.21	4.35	4.57	4.83	5.12	5.81
HPI89978	R0.02	**0.8**	4	0.65	6	45	0.75	7.57	6.46	6.81	7.21	7.65	8.73
HPI89979	R0.05	**0.8**	4	0.65	6	45	0.75	7.59	6.46	6.81	7.20	7.65	8.72
HPI89980	R0.1	**0.8**	4	0.65	6	45	0.75	7.62	6.46	6.81	7.20	7.63	8.70
HPI89981	R0.2	**0.8**	4	0.65	6	45	0.75	7.68	6.45	6.79	7.18	7.61	8.65
HPI89982	R0.02	**0.8**	4	0.65	8	50	0.75	6.50	8.56	9.03	9.56	10.15	11.29
HPI89983	R0.05	**0.8**	4	0.65	8	50	0.75	6.51	8.56	9.03	9.55	10.14	11.29
HPI89984	R0.1	**0.8**	4	0.65	8	50	0.75	6.54	8.56	9.03	9.54	10.13	11.28
HPI89985	R0.2	**0.8**	4	0.65	8	50	0.75	6.58	8.56	9.01	9.53	10.10	11.26
HPI89986	R0.05	**0.8**	4	0.65	12	50	0.75	5.08	12.77	13.47	14.25	15.11	15.96
HPI89987	R0.1	**0.8**	4	0.65	12	50	0.75	5.09	12.77	13.46	14.24	15.11	15.95
HPI89988	R0.2	**0.8**	4	0.65	12	50	0.75	5.12	12.76	13.45	14.22	15.09	15.93
HPI89009	R0.1	**0.9**	4	0.7	4	45	0.85	9.01	4.35	4.59	4.85	5.14	5.85
HPI89989	R0.1	**0.9**	4	0.7	8	50	0.85	6.42	8.56	9.03	9.54	10.13	11.22
HPI89010	R0.1	**1.0**	4	0.8	4	50	0.95	8.89	4.35	4.59	4.85	5.14	5.85
HPI89990	R0.2	**1.0**	4	0.8	4	50	0.95	8.98	4.35	4.57	4.83	5.12	5.81
HPI89991	R0.1	**1.0**	4	0.8	6	50	0.95	7.37	6.46	6.81	7.20	7.63	8.70
HPI89992	R0.2	**1.0**	4	0.8	6	50	0.95	7.44	6.45	6.79	7.18	7.61	8.65
HPI89993	R0.3	**1.0**	4	0.8	6	50	0.95	7.50	6.45	6.78	7.16	7.58	8.61
HPI89994	R0.1	**1.0**	4	0.8	8	50	0.95	6.30	8.56	9.03	9.54	10.13	11.16
HPI89995	R0.2	**1.0**	4	0.8	8	50	0.95	6.34	8.56	9.01	9.53	10.10	11.15

▶NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2		12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○										

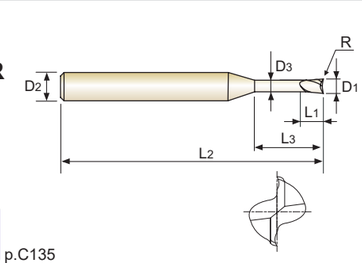
ISO	N									S								H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

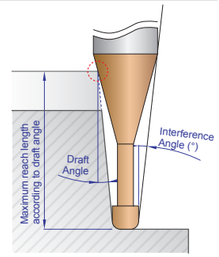
X1-EH END MILLS

PLAIN SHANK HPI89 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C135

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI89996	R0.1	**1.0**	4	0.8	10	50	0.95	5.50	10.66	11.25	11.89	12.62	13.50
HPI89997	R0.2	**1.0**	4	0.8	10	50	0.95	5.53	10.66	11.23	11.88	12.60	13.48
HPI89998	R0.3	**1.0**	4	0.8	10	50	0.95	5.57	10.65	11.22	11.86	12.57	13.47
HPI89999	R0.1	**1.0**	4	0.8	12	55	0.95	4.87	12.77	13.46	14.24	15.00	15.84
HPI89801	R0.2	**1.0**	4	0.8	12	55	0.95	4.90	12.76	13.45	14.22	14.99	15.82
HPI89802	R0.1	**1.0**	4	0.8	16	60	0.95	3.97	16.98	17.90	18.92	19.42	20.51
HPI89803	R0.2	**1.0**	4	0.8	16	60	0.95	3.99	16.97	17.89	18.92	19.41	20.49
HPI89804	R0.3	**1.0**	4	0.8	16	60	0.95	4.01	16.97	17.88	18.90	19.40	20.47
HPI89805	R0.1	**1.0**	4	0.8	20	60	0.95	3.35	21.19	22.34	23.23	23.85	25.18
HPI89806	R0.2	**1.0**	4	0.8	20	60	0.95	3.37	21.18	22.33	23.23	23.84	25.16
HPI89807	R0.3	**1.0**	4	0.8	20	60	0.95	3.38	21.17	22.32	23.22	23.83	25.15
HPI89015	R0.1	**1.5**	4	1.35	4	50	1.45	8.21	4.23	4.37	4.53	4.69	5.06
HPI89808	R0.2	**1.5**	4	1.35	4	50	1.45	8.31	4.22	4.36	4.51	4.68	5.04
HPI89809	R0.1	**1.5**	4	1.35	8	50	1.45	5.64	8.36	8.65	8.96	9.29	10.04
HPI89810	R0.2	**1.5**	4	1.35	8	50	1.45	5.68	8.36	8.64	8.95	9.28	10.01
HPI89811	R0.3	**1.5**	4	1.35	8	50	1.45	5.73	8.36	8.64	8.94	9.26	9.99
HPI89812	R0.2	**1.5**	4	1.35	12	55	1.45	4.32	12.49	12.92	13.38	13.88	14.99
HPI89813	R0.1	**1.5**	4	1.35	15	55	1.45	3.64	15.60	16.14	16.72	17.34	18.74
HPI89814	R0.2	**1.5**	4	1.35	15	55	1.45	3.66	15.59	16.13	16.71	17.33	18.71
HPI89815	R0.3	**1.5**	4	1.35	15	55	1.45	3.68	15.59	16.12	16.70	17.31	18.69
HPI89816	R0.1	**1.5**	4	1.35	20	60	1.45	2.90	20.77	21.49	22.26	23.09	-
HPI89817	R0.2	**1.5**	4	1.35	20	60	1.45	2.91	20.76	21.48	22.25	23.07	-
HPI89818	R0.3	**1.5**	4	1.35	20	60	1.45	2.93	20.76	21.47	22.24	23.06	-
HPI89020	R0.2	**2.0**	4	1.7	6	50	1.95	5.93	6.29	6.50	6.73	6.98	7.53
HPI89819	R0.5	**2.0**	4	1.7	6	50	1.95	6.12	6.28	6.48	6.70	6.93	7.45
HPI89820	R0.2	**2.0**	4	1.7	8	50	1.95	4.92	8.36	8.64	8.95	9.28	10.01

▶NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2		12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409		200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○										

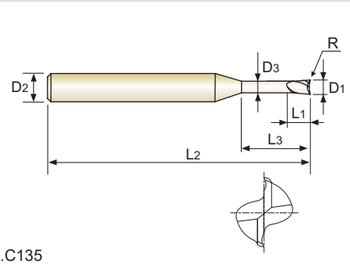
ISO	N									S								H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

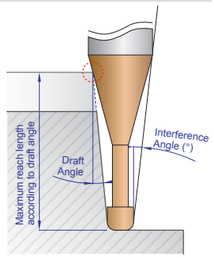
X1-EH END MILLS

PLAIN SHANK **HPI89** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C135

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI89821	R0.3	**2.0**	4	1.7	8	50	1.95	4.96	8.36	8.64	8.94	9.26	9.99
HPI89822	R0.5	**2.0**	4	1.7	8	50	1.95	5.05	8.35	8.62	8.92	9.23	9.94
HPI89823	R0.8	**2.0**	4	1.7	8	50	1.95	5.18	8.34	8.60	8.88	9.19	9.87
HPI89824	R0.2	**2.0**	4	1.7	12	55	1.95	3.66	12.49	12.92	13.38	13.88	14.99
HPI89825	R0.5	**2.0**	4	1.7	12	55	1.95	3.73	12.48	12.90	13.35	13.83	14.91
HPI89826	R0.2	**2.0**	4	1.7	16	55	1.95	2.92	16.63	17.20	17.81	18.48	-
HPI89827	R0.3	**2.0**	4	1.7	16	55	1.95	2.93	16.62	17.19	17.80	18.46	-
HPI89828	R0.5	**2.0**	4	1.7	16	55	1.95	2.96	16.62	17.18	17.78	18.43	-
HPI89829	R0.8	**2.0**	4	1.7	16	55	1.95	3.01	16.61	17.16	17.75	18.39	19.81
HPI89830	R0.2	**2.0**	4	1.7	20	60	1.95	2.42	20.76	21.48	22.25	23.07	-
HPI89831	R0.3	**2.0**	4	1.7	20	60	1.95	2.43	20.76	21.47	22.24	23.06	-
HPI89832	R0.5	**2.0**	4	1.7	20	60	1.95	2.45	20.75	21.46	22.22	23.03	-
HPI89833	R0.8	**2.0**	4	1.7	20	60	1.95	2.49	20.74	21.44	22.18	22.98	-
HPI89834	R0.2	**2.0**	4	1.7	25	65	1.95	2.00	25.93	26.83	27.79	28.82	-
HPI89835	R0.5	**2.0**	4	1.7	25	65	1.95	2.02	25.92	26.81	27.76	28.78	-
HPI89836	R0.2	**2.0**	4	1.7	30	70	1.95	1.70	31.10	32.18	33.33	-	-
HPI89837	R0.5	**2.0**	4	1.7	30	70	1.95	1.72	31.09	32.16	33.30	-	-
HPI89030	R0.2	**3.0**	6	2.5	8	55	2.85	6.26	8.55	8.84	9.16	9.49	10.24
HPI89838	R0.3	**3.0**	6	2.5	8	55	2.85	6.30	8.55	8.84	9.14	9.48	10.22
HPI89839	R0.5	**3.0**	6	2.5	8	55	2.85	6.40	8.54	8.82	9.12	9.45	10.17
HPI89840	R0.2	**3.0**	6	2.5	12	60	2.85	4.85	12.69	13.12	13.59	14.09	15.22
HPI89841	R0.5	**3.0**	6	2.5	12	60	2.85	4.93	12.68	13.10	13.56	14.05	15.14
HPI89842	R0.2	**3.0**	6	2.5	16	60	2.85	3.96	16.82	17.40	18.02	18.69	20.19
HPI89843	R0.3	**3.0**	6	2.5	16	60	2.85	3.98	16.82	17.39	18.01	18.67	20.17
HPI89844	R0.5	**3.0**	6	2.5	16	60	2.85	4.01	16.81	17.38	17.99	18.64	20.12
HPI89845	R0.2	**3.0**	6	2.5	20	65	2.85	3.34	20.96	21.68	22.45	23.29	25.16

▶NEXT PAGE

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	○	○	◎

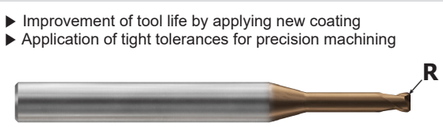
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

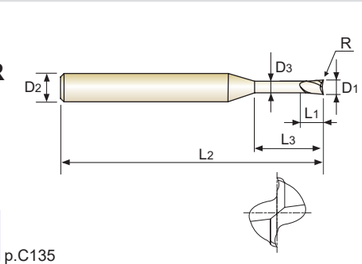
X1-EH END MILLS

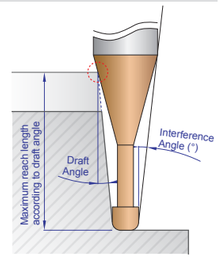
PLAIN SHANK **HPI89** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining







CARBIDE | 2 | 35° | R ±0.005 | PLAIN | C Coating | p.C135

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	R	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI89846	R0.3	**3.0**	6	2.5	20	65	2.85	3.36	20.95	21.67	22.44	23.27	25.14
HPI89847	R0.5	**3.0**	6	2.5	20	65	2.85	3.38	20.95	21.66	22.42	23.24	25.09
HPI89848	R0.2	**3.0**	6	2.5	30	75	2.85	2.41	31.29	32.38	33.54	34.79	-
HPI89849	R0.3	**3.0**	6	2.5	30	75	2.85	2.41	31.29	32.37	33.53	34.77	-
HPI89850	R0.5	**3.0**	6	2.5	30	75	2.85	2.43	31.28	32.36	33.51	34.74	-
HPI89851	R0.2	**3.0**	6	2.5	35	80	2.85	2.11	36.46	37.72	39.08	40.54	-
HPI89852	R0.5	**3.0**	6	2.5	35	80	2.85	2.13	36.45	37.70	39.05	40.49	-

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
±0.005	0~-0.010	h4

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
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HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

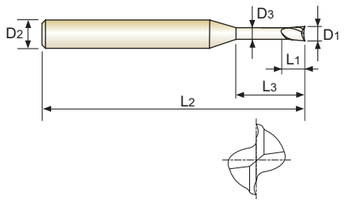
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

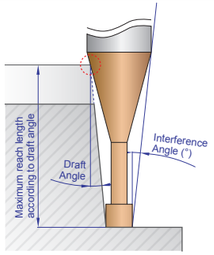
X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE SQUARE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





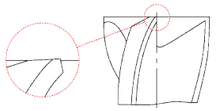
CARBIDE | 2 | 35° | PLAIN | C Coating | p.C138

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI88001	0.1	4	0.08	0.3	45	0.085	14.38	0.36	0.38	0.40	0.43	0.49
HPI88901	0.1	4	0.08	0.5	45	0.085	14.03	0.57	0.60	0.64	0.68	0.77
HPI88902	0.1	4	0.08	0.75	45	0.085	13.61	0.83	0.88	0.93	0.99	1.13
HPI88903	0.1	4	0.08	1	45	0.085	13.21	1.10	1.16	1.22	1.30	1.48
HPI880015	0.15	4	0.12	0.3	45	0.135	14.37	0.36	0.38	0.40	0.43	0.49
HPI88904	0.15	4	0.12	0.5	45	0.135	14.01	0.57	0.60	0.64	0.68	0.77
HPI88905	0.15	4	0.12	0.75	45	0.135	13.59	0.83	0.88	0.93	0.99	1.13
HPI88906	0.15	4	0.12	1	45	0.135	13.19	1.10	1.16	1.22	1.30	1.48
HPI88907	0.15	4	0.12	1.5	45	0.135	12.46	1.62	1.71	1.81	1.92	2.19
HPI88002	0.2	4	0.15	0.5	45	0.17	13.95	0.62	0.65	0.69	0.73	0.83
HPI88908	0.2	4	0.15	0.75	45	0.17	13.53	0.88	0.93	0.98	1.04	1.19
HPI88909	0.2	4	0.15	1	45	0.17	13.13	1.14	1.20	1.27	1.35	1.54
HPI88910	0.2	4	0.15	1.5	45	0.17	12.39	1.67	1.76	1.86	1.98	2.26
HPI88911	0.2	4	0.15	2	45	0.17	11.73	2.19	2.31	2.45	2.60	2.97
HPI88912	0.2	4	0.15	2.5	45	0.17	11.14	2.72	2.87	3.04	3.22	3.68
HPI88913	0.2	4	0.15	3	45	0.17	10.61	3.25	3.42	3.62	3.85	4.39
HPI88003	0.3	4	0.25	1	45	0.27	13.08	1.14	1.20	1.27	1.35	1.54
HPI88914	0.3	4	0.25	1.5	45	0.27	12.33	1.67	1.76	1.86	1.98	2.26
HPI88915	0.3	4	0.25	2	45	0.27	11.67	2.19	2.31	2.45	2.60	2.97
HPI88916	0.3	4	0.25	2.5	45	0.27	11.06	2.72	2.87	3.04	3.22	3.68
HPI88917	0.3	4	0.25	3	45	0.27	10.52	3.25	3.42	3.62	3.85	4.39
HPI88004	0.4	4	0.3	1	45	0.37	13.04	1.14	1.20	1.27	1.35	1.54
HPI88918	0.4	4	0.3	1.5	45	0.37	12.27	1.67	1.76	1.86	1.98	2.26
HPI88919	0.4	4	0.3	2	45	0.37	11.59	2.19	2.31	2.45	2.60	2.97

▶NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

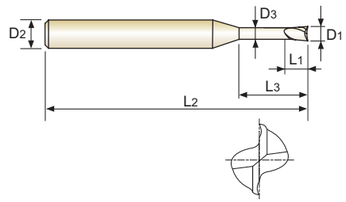
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

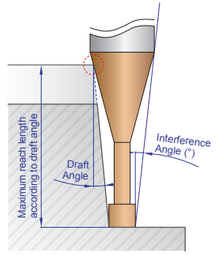
X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE SQUARE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





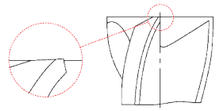
CARBIDE | 2 | 35° | PLAIN | C Coating | p.C138

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI88920	0.4	4	0.3	2.5	45	0.37	10.98	2.72	2.87	3.04	3.22	3.68
HPI88921	0.4	4	0.3	3	45	0.37	10.44	3.25	3.42	3.62	3.85	4.39
HPI88922	0.4	4	0.3	3.5	45	0.37	9.94	3.77	3.98	4.21	4.47	5.10
HPI88923	0.4	4	0.3	4	45	0.37	9.49	4.30	4.53	4.80	5.09	5.81
HPI88924	0.4	4	0.3	5	45	0.37	8.69	5.35	5.64	5.97	6.34	7.24
HPI88925	0.4	4	0.3	6	45	0.37	8.02	6.40	6.75	7.15	7.59	8.66
HPI88926	0.4	4	0.3	8	45	0.37	6.95	8.51	8.97	9.50	10.08	11.48
HPI88927	0.4	4	0.3	10	45	0.37	6.13	10.61	11.19	11.84	12.58	13.82
HPI88005	0.5	4	0.4	1	45	0.45	12.93	1.20	1.27	1.34	1.42	1.62
HPI88928	0.5	4	0.4	1.5	45	0.45	12.16	1.73	1.82	1.93	2.05	2.34
HPI88929	0.5	4	0.4	2	45	0.45	11.47	2.25	2.38	2.52	2.67	3.05
HPI88930	0.5	4	0.4	2.5	45	0.45	10.86	2.78	2.93	3.10	3.29	3.76
HPI88931	0.5	4	0.4	3	45	0.45	10.31	3.31	3.49	3.69	3.92	4.47
HPI88932	0.5	4	0.4	3.5	45	0.45	9.81	3.83	4.04	4.28	4.54	5.18
HPI88933	0.5	4	0.4	4	45	0.45	9.35	4.36	4.60	4.86	5.16	5.89
HPI88934	0.5	4	0.4	4.5	45	0.45	8.94	4.88	5.15	5.45	5.79	6.60
HPI88935	0.5	4	0.4	5	45	0.45	8.56	5.41	5.71	6.04	6.41	7.32
HPI88936	0.5	4	0.4	6	45	0.45	7.89	6.46	6.82	7.21	7.66	8.74
HPI88937	0.5	4	0.4	7	45	0.45	7.32	7.51	7.93	8.39	8.91	10.16
HPI88938	0.5	4	0.4	8	50	0.45	6.82	8.57	9.04	9.56	10.15	11.47
HPI88939	0.5	4	0.4	9	50	0.45	6.39	9.62	10.15	10.74	11.40	12.64
HPI88940	0.5	4	0.4	10	50	0.45	6.01	10.67	11.26	11.91	12.65	13.80
HPI88006	0.6	4	0.5	1.5	45	0.55	12.09	1.73	1.82	1.93	2.05	2.34
HPI88941	0.6	4	0.5	2	45	0.55	11.39	2.25	2.38	2.52	2.67	3.05

▶NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

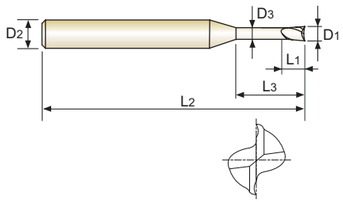
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

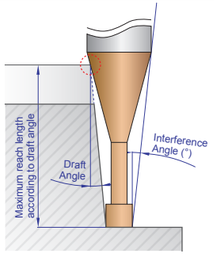
X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE SQUARE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





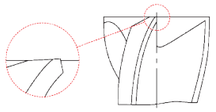
CARBIDE | 2 | 35° | PLAIN | C Coating | p.C138

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88942	**0.6**	4	0.5	3	45	0.55	10.21	3.31	3.49	3.69	3.92	4.47
HPI88943	**0.6**	4	0.5	4	45	0.55	9.25	4.36	4.60	4.86	5.16	5.89
HPI88944	**0.6**	4	0.5	5	45	0.55	8.45	5.41	5.71	6.04	6.41	7.32
HPI88945	**0.6**	4	0.5	6	45	0.55	7.78	6.46	6.82	7.21	7.66	8.74
HPI88007	**0.7**	4	0.55	2	45	0.65	11.31	2.25	2.38	2.52	2.67	3.05
HPI88946	**0.7**	4	0.55	4	45	0.65	9.14	4.36	4.60	4.86	5.16	5.89
HPI88947	**0.7**	4	0.55	6	45	0.65	7.67	6.46	6.82	7.21	7.66	8.74
HPI88948	**0.7**	4	0.55	8	50	0.65	6.60	8.57	9.04	9.56	10.15	11.35
HPI88949	**0.7**	4	0.55	10	50	0.65	5.80	10.67	11.26	11.91	12.65	13.69
HPI88008	**0.8**	4	0.65	3	45	0.75	10.01	3.31	3.49	3.69	3.92	4.47
HPI88950	**0.8**	4	0.65	4	45	0.75	9.03	4.36	4.60	4.86	5.16	5.89
HPI88951	**0.8**	4	0.65	5	45	0.75	8.23	5.41	5.71	6.04	6.41	7.32
HPI88952	**0.8**	4	0.65	6	45	0.75	7.55	6.46	6.82	7.21	7.66	8.74
HPI88953	**0.8**	4	0.65	8	50	0.75	6.49	8.57	9.04	9.56	10.15	11.29
HPI88954	**0.8**	4	0.65	10	50	0.75	5.69	10.67	11.26	11.91	12.65	13.63
HPI88955	**0.8**	4	0.65	12	50	0.75	5.06	12.77	13.48	14.26	15.12	15.97
HPI88010	**1.0**	4	0.8	2	50	0.95	11.04	2.25	2.38	2.52	2.67	3.05
HPI88956	**1.0**	4	0.8	3	50	0.95	9.79	3.31	3.49	3.69	3.92	4.47
HPI88957	**1.0**	4	0.8	4	50	0.95	8.80	4.36	4.60	4.86	5.16	5.89
HPI88958	**1.0**	4	0.8	5	50	0.95	7.99	5.41	5.71	6.04	6.41	7.32
HPI88959	**1.0**	4	0.8	6	50	0.95	7.31	6.46	6.82	7.21	7.66	8.74
HPI88960	**1.0**	4	0.8	7	50	0.95	6.74	7.51	7.93	8.39	8.91	10.01
HPI88961	**1.0**	4	0.8	8	50	0.95	6.25	8.57	9.04	9.56	10.15	11.18
HPI88962	**1.0**	4	0.8	9	50	0.95	5.83	9.62	10.15	10.74	11.40	12.35

▶NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

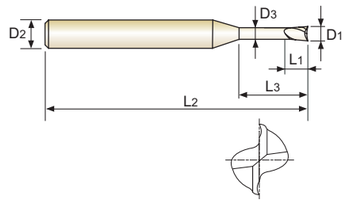
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

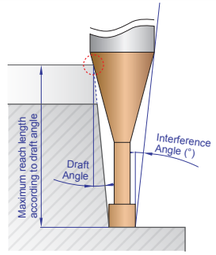
X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE SQUARE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





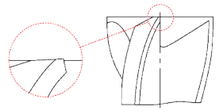
CARBIDE | 2 | 35° | PLAIN | C Coating | p.C138

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88963	**1.0**	4	0.8	10	50	0.95	5.46	10.67	11.26	11.91	12.65	13.52
HPI88964	**1.0**	4	0.8	12	50	0.95	4.85	12.77	13.48	14.26	15.01	15.85
HPI88965	**1.0**	4	0.8	14	50	0.95	4.36	14.88	15.70	16.61	17.22	18.19
HPI88966	**1.0**	4	0.8	16	60	0.95	3.96	16.98	17.92	18.93	19.43	20.53
HPI88967	**1.0**	4	0.8	18	60	0.95	3.62	19.09	20.13	21.09	21.65	22.86
HPI88968	**1.0**	4	0.8	20	60	0.95	3.34	21.19	22.35	23.24	23.86	25.20
HPI88969	**1.0**	4	0.8	22	60	0.95	3.10	23.29	24.57	25.40	26.07	27.53
HPI88012	**1.2**	4	1	6	50	1.15	7.05	6.30	6.52	6.75	7.01	7.57
HPI88970	**1.2**	4	1	8	50	1.15	6.00	8.37	8.66	8.97	9.31	10.06
HPI88971	**1.2**	4	1	10	50	1.15	5.22	10.43	10.80	11.19	11.61	12.55
HPI88972	**1.2**	4	1	12	50	1.15	4.62	12.50	12.94	13.40	13.91	15.03
HPI88973	**1.2**	4	1	16	60	1.15	3.76	16.64	17.21	17.84	18.50	20.01
HPI88014	**1.4**	4	1.1	6	50	1.35	6.77	6.30	6.52	6.75	7.01	7.57
HPI88974	**1.4**	4	1.1	12	50	1.35	4.39	12.50	12.94	13.40	13.91	15.03
HPI88015	**1.5**	4	1.2	4	50	1.45	8.12	4.23	4.38	4.54	4.71	5.09
HPI88975	**1.5**	4	1.2	6	50	1.45	6.63	6.30	6.52	6.75	7.01	7.57
HPI88976	**1.5**	4	1.2	8	50	1.45	5.60	8.37	8.66	8.97	9.31	10.06
HPI88977	**1.5**	4	1.2	10	50	1.45	4.84	10.43	10.80	11.19	11.61	12.55
HPI88978	**1.5**	4	1.2	12	50	1.45	4.27	12.50	12.94	13.40	13.91	15.03
HPI88979	**1.5**	4	1.2	14	60	1.45	3.81	14.57	15.08	15.62	16.21	17.52
HPI88980	**1.5**	4	1.2	16	60	1.45	3.45	16.64	17.21	17.84	18.50	20.01
HPI88981	**1.5**	4	1.2	18	60	1.45	3.14	18.70	19.35	20.05	20.80	22.49
HPI88982	**1.5**	4	1.2	20	60	1.45	2.89	20.77	21.49	22.27	23.10	-
HPI88983	**1.5**	4	1.2	25	70	1.45	2.41	25.94	26.84	27.81	28.85	-

▶NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

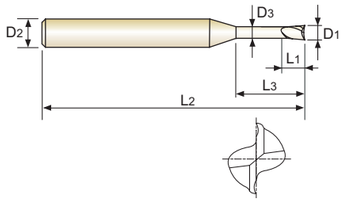
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

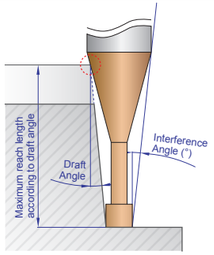
X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE SQUARE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | PLAIN | C Coating

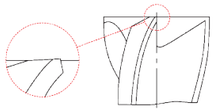
p.C138

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88984	1.5	4	1.2	30	70	1.45	2.06	31.11	32.19	33.35	34.60	-
HPI88985	1.5	4	1.2	35	80	1.45	1.80	36.27	37.54	38.89	-	-
HPI88016	1.6	4	1.3	6	50	1.55	6.48	6.30	6.52	6.75	7.01	7.57
HPI88986	1.6	4	1.3	8	50	1.55	5.45	8.37	8.66	8.97	9.31	10.06
HPI88018	1.8	4	1.4	6	50	1.75	6.16	6.30	6.52	6.75	7.01	7.57
HPI88987	1.8	4	1.4	8	50	1.75	5.15	8.37	8.66	8.97	9.31	10.06
HPI88988	1.8	4	1.4	10	50	1.75	4.43	10.43	10.80	11.19	11.61	12.55
HPI88989	1.8	4	1.4	12	50	1.75	3.88	12.50	12.94	13.40	13.91	15.03
HPI88990	1.8	4	1.4	14	50	1.75	3.46	14.57	15.08	15.62	16.21	17.52
HPI88991	1.8	4	1.4	16	60	1.75	3.12	16.64	17.21	17.84	18.50	20.01
HPI88992	1.8	4	1.4	18	60	1.75	2.84	18.70	19.35	20.05	20.80	-
HPI88020	2.0	4	1.6	4	50	1.95	7.28	4.23	4.38	4.54	4.71	5.09
HPI88993	2.0	4	1.6	6	50	1.95	5.81	6.30	6.52	6.75	7.01	7.57
HPI88994	2.0	4	1.6	8	50	1.95	4.83	8.37	8.66	8.97	9.31	10.06
HPI88995	2.0	4	1.6	10	50	1.95	4.14	10.43	10.80	11.19	11.61	12.55
HPI88996	2.0	4	1.6	12	50	1.95	3.62	12.50	12.94	13.40	13.91	15.03
HPI88997	2.0	4	1.6	14	60	1.95	3.21	14.57	15.08	15.62	16.21	17.52
HPI88998	2.0	4	1.6	16	60	1.95	2.89	16.64	17.21	17.84	18.50	-
HPI88999	2.0	4	1.6	18	60	1.95	2.62	18.70	19.35	20.05	20.80	-
HPI88801	2.0	4	1.6	20	60	1.95	2.40	20.77	21.49	22.27	23.10	-
HPI88802	2.0	4	1.6	25	70	1.95	1.99	25.94	26.84	27.81	-	-
HPI88803	2.0	4	1.6	30	70	1.95	1.69	31.11	32.19	33.35	-	-
HPI88804	2.0	4	1.6	35	80	1.95	1.48	36.27	37.54	-	-	-
HPI88805	2.0	4	1.6	40	90	1.95	1.31	41.44	42.89	-	-	-

▶NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

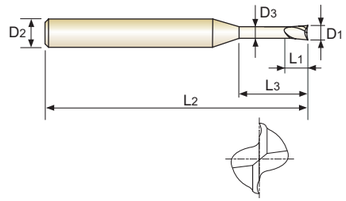
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

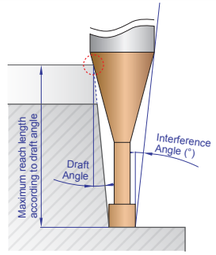
X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE SQUARE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining





CARBIDE | 2 | 35° | PLAIN | C Coating

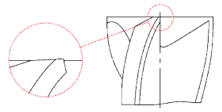
p.C138

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	D_1	D_2	L_1	L_3	L_2	D_3		0.5°	1°	1.5°	2°	3°
HPI88806	2.0	4	1.6	50	100	1.95	1.06	51.78	53.58	-	-	-
HPI88025	2.5	4	2	8	50	2.4	3.91	8.46	8.76	9.07	9.41	10.18
HPI88807	2.5	4	2	12	50	2.4	2.87	12.60	13.04	13.51	14.01	-
HPI88808	2.5	4	2	16	60	2.4	2.26	16.73	17.31	17.94	18.61	-
HPI88809	2.5	4	2	20	60	2.4	1.87	20.87	21.59	22.37	-	-
HPI88810	2.5	4	2	30	70	2.4	1.30	31.20	32.29	-	-	-
HPI88811	2.5	4	2	40	90	2.4	1.00	41.54	-	-	-	-
HPI88812	2.5	4	2	50	100	2.4	0.81	51.88	-	-	-	-
HPI88030	3.0	6	4.5	8	50	2.85	6.17	8.56	8.86	9.18	9.52	10.29
HPI88813	3.0	6	4.5	12	50	2.85	4.80	12.69	13.14	13.61	14.12	15.27
HPI88814	3.0	6	4.5	16	60	2.85	3.92	16.83	17.41	18.04	18.72	20.24
HPI88815	3.0	6	4.5	20	60	2.85	3.32	20.96	21.69	22.48	23.32	25.21
HPI88816	3.0	6	4.5	25	70	2.85	2.78	26.13	27.04	28.02	29.07	-
HPI88817	3.0	6	4.5	30	70	2.85	2.39	31.30	32.39	33.56	34.82	-
HPI88040	4.0	6	6	12	60	3.85	3.57	12.69	13.14	13.61	14.12	15.27
HPI88818	4.0	6	6	16	60	3.85	2.86	16.83	17.41	18.04	18.72	-
HPI88819	4.0	6	6	20	70	3.85	2.38	20.96	21.69	22.48	23.32	-
HPI88820	4.0	6	6	30	80	3.85	1.68	31.30	32.39	33.56	-	-
HPI88821	4.0	6	6	40	90	3.85	1.30	41.64	43.09	-	-	-
HPI88822	4.0	6	6	50	100	3.85	1.06	51.97	53.78	-	-	-
HPI88050	5.0	6	7.5	20	70	4.85	1.29	20.96	21.69	-	-	-
HPI88823	5.0	6	7.5	30	80	4.85	0.89	31.30	-	-	-	-
HPI88824	5.0	6	7.5	40	90	4.85	0.68	41.64	-	-	-	-
HPI88825	5.0	6	7.5	50	100	4.85	0.55	51.97	-	-	-	-

▶NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

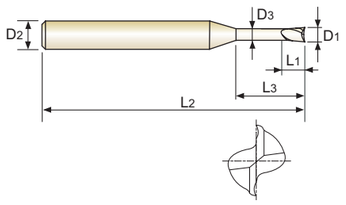
ISO	N									S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials	Heat Resistant Super Alloys					Titanium Alloys		Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

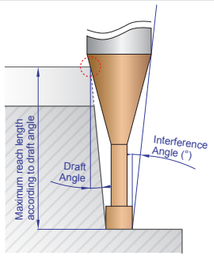
X1-EH END MILLS

PLAIN SHANK **HPI88 SERIES**

CARBIDE, 2 FLUTE SQUARE for RIB PROCESSING

- Improvement of tool life by applying new coating
- Application of tight tolerances for precision machining



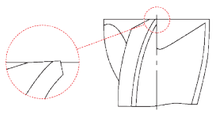


CARBIDE | 2 | 35° | PLAIN | C Coating | p.C138

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Interference Angle (°)	Maximum reach lengths according to draft angle				
	D1	D2	L1	L3	L2	D3		0.5°	1°	1.5°	2°	3°
HPI88060	6.0	6	9	20	70	5.85	0.00	-	-	-	-	-
HPI88826	6.0	6	9	30	80	5.85	0.00	-	-	-	-	-
HPI88827	6.0	6	9	40	90	5.85	0.00	-	-	-	-	-
HPI88828	6.0	6	9	50	100	5.85	0.00	-	-	-	-	-

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.010	h4



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14.1	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○	○									

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys			Hardened steel					Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38.1	38.2	39.1	39.2	39.3	40	41
HRc											15	30	25	38	34			45-49	50-55	56-60	61-65	66-70	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	421-469	481-560	577-654	670-739		400	550
Recommended																		◎	◎	◎	◎	◎	○	◎

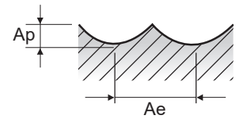
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI90 SERIES 2 FLUTE BALL NOSE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

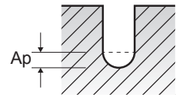
ISO	VDI 3323	Material Description	Ae	Ap	Para meter	Diameter (Ø)																	
						0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	5	Non-alloy steel	0.05D	0.02D	SFM(Vc)	100	150	220	270	320	420	525	795	1045	1050	1050	1065	980	880	945	980	880	945	945
					IPT(fz)	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0021	.0022	.0029	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0094	.0104
					RPM	49180	49180	53280	52460	51910	51230	50820	51370	50820	40690	33880	25820	19020	14210	11480	9510	7100	5740	4590
					IPM(FEED)	46	58	80	99	119	157	192	218	228	235	243	244	234	195	171	149	119	108	95
	8	Low alloy steel	0.05D	0.02D	SFM(Vc)	100	150	220	270	320	420	525	795	1045	1050	1050	1065	980	880	945	980	880	945	945
					IPT(fz)	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0021	.0022	.0029	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0094	.0104
					RPM	49180	49180	53280	52460	51910	51230	50820	51370	50820	40690	33880	25820	19020	14210	11480	9510	7100	5740	4590
					IPM(FEED)	46	58	80	99	119	157	192	218	228	235	243	244	234	195	171	149	119	108	95
	9		0.05D	0.02D	SFM(Vc)	100	150	220	270	320	420	525	795	1045	1050	1050	1065	980	880	945	980	880	945	945
					IPT(fz)	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0021	.0022	.0029	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0094	.0104
					RPM	49180	49180	53280	52460	51910	51230	50820	51370	50820	40690	33880	25820	19020	14210	11480	9510	7100	5740	4590
					IPM(FEED)	46	58	80	99	119	157	192	218	228	235	243	244	234	195	171	149	119	108	95
	11.1	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	100	150	220	270	320	420	525	795	1045	1050	1050	1065	980	880	945	980	880	945	945
					IPT(fz)	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0021	.0022	.0029	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0094	.0104
					RPM	49180	49180	53280	52460	51910	51230	50820	51370	50820	40690	33880	25820	19020	14210	11480	9510	7100	5740	4590
					IPM(FEED)	46	58	80	99	119	157	192	218	228	235	243	244	234	195	171	149	119	108	95
	11.2		0.05D	0.02D	SFM(Vc)	100	150	220	270	320	420	525	760	1015	1010	1015	1015	945	860	910	945	845	910	910
					IPT(fz)	.0004	.0006	.0007	.0008	.0010	.0013	.0017	.0019	.0020	.0026	.0033	.0044	.0054	.0060	.0065	.0069	.0074	.0081	.0089
					RPM	49180	49180	53280	52460	51910	51230	50820	49180	49180	39300	32790	24590	18360	13930	11070	9180	6830	5530	4430
					IPM(FEED)	43	54	71	87	102	133	168	182	194	204	214	215	200	168	143	126	101	90	79
H	38.1		0.05D	0.02D	SFM(Vc)	100	150	220	270	320	420	525	760	1015	1010	1015	1015	945	860	910	945	845	910	910
					IPT(fz)	.0004	.0006	.0007	.0008	.0010	.0013	.0017	.0019	.0020	.0026	.0033	.0044	.0054	.0060	.0065	.0069	.0074	.0081	.0089
					RPM	49180	49180	53280	52460	51910	51230	50820	49180	49180	39300	32790	24590	18360	13930	11070	9180	6830	5530	4430
					IPM(FEED)	43	54	71	87	102	133	168	182	194	204	214	215	200	168	143	126	101	90	79
	38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	95	135	185	235	285	390	475	695	845	845	845	845	795	695	760	795	710	760	760
					IPT(fz)	.0004	.0005	.0007	.0008	.0009	.0013	.0017	.0019	.0020	.0025	.0030	.0039	.0049	.0056	.0059	.0063	.0067	.0074	.0082
					RPM	45900	43710	45080	45900	46450	47130	45900	44810	40980	32750	27320	20490	15410	11200	9220	7700	5740	4610	3690
					IPM(FEED)	36	45	60	76	88	122	152	166	161	161	161	161	152	124	109	97	77	69	60
	39.1		0.05D	0.02D	SFM(Vc)	85	135	170	220	255	340	420	590	745	745	745	745	710	640	675	695	640	675	675
					IPT(fz)	.0004	.0005	.0006	.0007	.0009	.0012	.0015	.0017	.0018	.0022	.0026	.0035	.0044	.0049	.0053	.0057	.0061	.0067	.0074
					RPM	40980	43710	40980	42620	40980	40980	40980	38250	36060	28840	24040	18030	13770	10380	8200	6720	5190	4100	3280
					IPM(FEED)	32	41	48	64	74	97	123	126	128	127	127	128	123	102	86	76	63	55	49
	39.2		0.05D	0.02D	SFM(Vc)	70	120	150	185	220	305	370	525	675	675	675	675	610	560	590	610	560	590	590
					IPT(fz)	.0004	.0005	.0006	.0007	.0009	.0012	.0015	.0016	.0017	.0022	.0026	.0035	.0044	.0048	.0052	.0056	.0056	.0056	.0056
					RPM	32790	38250	36880	36060	35520	36880	36060	33880	32790	26270	21860	16390	11800	9020	7170	5900	4510	3590	2870
					IPM(FEED)	26	36	44	54	64	87	105	109	114	114	115	114	103	87	75	66	50	40	32
	39.3		0.05D	0.02D	SFM(Vc)	70	100	135	170	205	270	370	475	610	610	610	610	560	505	560	560	505	540	540
					IPT(fz)	.0004	.0004	.0006	.0007	.0009	.0011	.0013	.0015	.0016	.0020	.0024	.0031	.0039	.0043	.0047	.0051	.0052	.0052	.0051
					RPM	32790	32790	32790	32790	32790	32790	36060	30600	29510	23590	19670	14750	10820	8200	6760	5410	4100	3280	2620
					IPM(FEED)	23	28	36	44	57	75	94	94	93	94	94	92	85	70	63	55	42	34	27
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	100	150	220	270	320	420	525	760	1015	1010	1015	1015	945	860	910	945	845	910	910
					IPT(fz)	.0004	.0006	.0007	.0008	.0010	.0013	.0017	.0019	.0020	.0026	.0033	.0044	.0054	.0060	.0065	.0069	.0074	.0081	.0089
					RPM	49180	49180	53280	52460	51910	51230	50820	49180	49180	39300	32790	24590	18360	13930	11070	9180	6830	5530	4430
					IPM(FEED)	43	54	71	87	102	133	168	182	194	204	214	215	200	168	143	126	101	90	79
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	95	135	185	235	285	390	475	695	845	845	845	845	795	695	760	795	710	760	760
					IPT(fz)	.0004	.0005	.0007	.0008	.0009	.0013	.0017	.0019	.0020	.0025	.0030	.0039	.0049	.0056	.0059	.0063	.0067	.0074	.0082
					RPM	45900	43710	45080	45900	46450	47130	45900	44810	40980	32750	27320	20490	15410	11200	9220	7700	5740	4610	3690
					IPM(FEED)	36	45	60	76	88	122	152	166	161	161	161	161	152	124	109	97	77	69	60



X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING

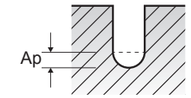


SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																	
				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
				LBS	0.3	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	5	0.5	0.6	0.75	1	1.25	1.5	1.75
P	5	Non-alloy steel	SFM(Vc)	100	100	100	100	90	90	90	90	80	80	30	150	150	150	150	150	150	135
			IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006
			RPM	49180	49180	49180	49180	44260	44260	44260	44260	39340	39340	14750	49180	49180	49180	49180	49180	49180	44260
			IPM(FEED)	46	46	46	46	38	38	38	38	31	31	8	58	58	58	58	58	58	49
			Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	8	Low alloy steel	SFM(Vc)	100	100	100	100	90	90	90	90	80	80	30	150	150	150	150	150	150	135
			IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006
			RPM	49180	49180	49180	49180	44260	44260	44260	44260	39340	39340	14750	49180	49180	49180	49180	49180	49180	44260
			IPM(FEED)	46	46	46	46	38	38	38	38	31	31	8	58	58	58	58	58	58	49
			Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	9		SFM(Vc)	100	100	100	100	90	90	90	90	80	80	30	150	150	150	150	150	150	135
			IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006
			RPM	49180	49180	49180	49180	44260	44260	44260	44260	39340	39340	14750	49180	49180	49180	49180	49180	49180	44260
			IPM(FEED)	46	46	46	46	38	38	38	38	31	31	8	58	58	58	58	58	58	49
			Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	11.1	High alloyed steel, and tool steel	SFM(Vc)	100	100	100	100	90	90	90	90	80	80	30	150	150	150	150	150	150	135
			IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006
			RPM	49180	49180	49180	49180	44260	44260	44260	44260	39340	39340	14750	49180	49180	49180	49180	49180	49180	44260
			IPM(FEED)	46	46	46	46	38	38	38	38	31	31	8	58	58	58	58	58	58	49
			Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	11.2		SFM(Vc)	100	100	100	100	90	90	90	90	80	80	30	150	150	150	150	150	150	135
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0005
			RPM	49180	49180	49180	49180	44260	44260	44260	44260	39340	39340	14750	49180	49180	49180	49180	49180	49180	44260
			IPM(FEED)	43	43	43	43	35	35	35	35	28	28	8	54	54	54	54	54	54	45
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
H	38.1	Hardened steel	SFM(Vc)	100	100	100	100	90	90	90	90	80	80	30	150	150	150	150	150	150	135
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0005
			RPM	49180	49180	49180	49180	44260	44260	44260	44260	39340	39340	14750	49180	49180	49180	49180	49180	49180	44260
			IPM(FEED)	43	43	43	43	35	35	35	35	28	28	8	54	54	54	54	54	54	45
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	38.2		SFM(Vc)	95	95	95	95	85	85	85	85	75	75	30	135	135	135	135	135	135	120
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0002	.0005	.0005	.0005	.0005	.0005	.0005	.0005
			RPM	45900	45900	45900	45900	41310	41310	41310	41310	36720	36720	13770	43710	43710	43710	43710	43710	43710	39340
			IPM(FEED)	36	36	36	36	29	29	29	29	23	23	6	45	45	45	45	45	45	37
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	39.1		SFM(Vc)	85	85	85	85	75	75	75	75	70	70	25	135	135	135	135	135	135	120
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0002	.0005	.0005	.0005	.0005	.0005	.0005	.0004
			RPM	40980	40980	40980	40980	36890	36890	36890	36890	32790	32790	12300	43710	43710	43710	43710	43710	43710	39340
			IPM(FEED)	32	32	32	32	26	26	26	26	21	21	6	41	41	41	41	41	41	34
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	39.2		SFM(Vc)	70	70	70	70	60	60	60	60	55	55	20	120	120	120	120	120	120	105
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0002	.0005	.0005	.0005	.0005	.0005	.0005	.0004
			RPM	32790	32790	32790	32790	29510	29510	29510	29510	26230	26230	9840	38250	38250	38250	38250	38250	38250	34430
			IPM(FEED)	26	26	26	26	21	21	21	21	17	17	5	36	36	36	36	36	36	30
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	39.3		SFM(Vc)	70	70	70	70	60	60	60	60	55	55	20	100	100	100	100	100	100	90
			IPT(fz)	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	32790	32790	32790	32790	29510	29510	29510	29510	26230	26230	9840	32790	32790	32790	32790	32790	32790	29510
			IPM(FEED)	23	23	23	23	19	19	19	19	14	14	4	28	28	28	28	28	28	23
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0001	.0001	.0001	.0001
	40	Chilled Cast Iron	SFM(Vc)	100	100	100	100	90	90	90	90	80	80	30	150	150	150	150	150	150	135
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0005
			RPM	49180	49180	49180	49180	44260	44260	44260	44260	39340	39340	14750	49180	49180	49180	49180	49180	49180	44260
			IPM(FEED)	43	43	43	43	35	35	35	35	28	28	8	54	54	54	54	54	54	45
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	41	Hardened Cast Iron	SFM(Vc)	95	95	95	95	85	85	85	85	75	75	30	135	135	135	135	135	135	120
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0002	.0005	.0005	.0005	.0005	.0005	.0005	.0005
			RPM	45900	45900	45900	45900	41310	41310	41310	41310	36720	36720	13770	43710	43710	43710	43710	43710	43710	39340
			IPM(FEED)	36	36	36	36	29	29	29	29	23	23	6	45	45	45	45	45	45	37
			Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002

▶NEXT PAGE

X1-EH END MILLS
RECOMMENDED CUTTING CONDITIONS
HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

VDI 3323	Parameter	Diameter (Ø)																			
		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
	LBS	2	2.25	2.5	3	3.5	4	5	7	0.5	0.8	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	1
5	SFM(Vc)	135	135	135	135	120	120	90	45	220	220	220	220	220	200	200	200	200	175	175	175	130	270
	IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0009
	RPM	44260	44260	44260	44260	39340	39340	29510	14750	53280	53280	53280	53280	53280	47950	47950	47950	47950	42620	42620	42620	31970	52460
	IPM(FEED)	49	49	49	49	37	37	26	10	80	80	80	80	80	64	64	64	64	50	50	50	33	99
	Ap	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004
8	SFM(Vc)	135	135	135	135	120	120	90	45	220	220	220	220	220	200	200	200	200	175	175	175	130	270
	IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0009
	RPM	44260	44260	44260	44260	39340	39340	29510	14750	53280	53280	53280	53280	53280	47950	47950	47950	47950	42620	42620	42620	31970	52460
	IPM(FEED)	49	49	49	49	37	37	26	10	80	80	80	80	80	64	64	64	64	50	50	50	33	99
	Ap	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004
9	SFM(Vc)	135	135	135	135	120	120	90	45	220	220	220	220	220	200	200	200	200	175	175	175	130	270
	IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0009
	RPM	44260	44260	44260	44260	39340	39340	29510	14750	53280	53280	53280	53280	53280	47950	47950	47950	47950	42620	42620	42620	31970	52460
	IPM(FEED)	49	49	49	49	37	37	26	10	80	80	80	80	80	64	64	64	64	50	50	50	33	99
	Ap	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004
11.1	SFM(Vc)	135	135	135	135	120	120	90	45	220	220	220	220	220	200	200	200	200	175	175	175	130	270
	IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0009
	RPM	44260	44260	44260	44260	39340	39340	29510	14750	53280	53280	53280	53280	53280	47950	47950	47950	47950	42620	42620	42620	31970	52460
	IPM(FEED)	49	49	49	49	37	37	26	10	80	80	80	80	80	64	64	64	64	50	50	50	33	99
	Ap	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004
11.2	SFM(Vc)	135	135	135	135	120	120	90	45	220	220	220	220	220	200	200	200	200	175	175	175	130	270
	IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0008
	RPM	44260	44260	44260	44260	39340	39340	29510	14750	53280	53280	53280	53280	53280	47950	47950	47950	47950	42620	42620	42620	31970	52460
	IPM(FEED)	45	45	45	45	34	34	23	9	71	71	71	71	71	57	57	57	57	47	47	47	30	87
	Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003
38.1	SFM(Vc)	135	135	135	135	120	120	90	45	220	220	220	220	220	200	200	200	200	175	175	175	130	270
	IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0008
	RPM	44260	44260	44260	44260	39340	39340	29510	14750	53280	53280	53280	53280	53280	47950	47950	47950	47950	42620	42620	42620	31970	52460
	IPM(FEED)	45	45	45	45	34	34	23	9	71	71	71	71	71	57	57	57	57	47	47	47	30	87
	Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003
38.2	SFM(Vc)	120	120	120	120	110	110	80	40	185	185	185	185	185	165	165	165	165	150	150	150	110	235
	IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0008
	RPM	39340	39340	39340	39340	34970	34970	26230	13110	45080	45080	45080	45080	45080	40570	40570	40570	40570	36070	36070	36070	27050	45900
	IPM(FEED)	37	37	37	37	28	28	19	8	60	60	60	60	60	48	48	48	48	40	40	40	26	76
	Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003
39.1	SFM(Vc)	120	120	120	120	110	110	80	40	170	170	170	170	170	150	150	150	150	135	135	135	100	220
	IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0007
	RPM	39340	39340	39340	39340	34970	34970	26230	13110	40980	40980	40980	40980	40980	36890	36890	36890	36890	32790	32790	32790	24590	42620
	IPM(FEED)	34	34	34	34	28	28	17	7	48	48	48	48	48	41	41	41	41	31	31	31	21	64
	Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0000	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003
39.2	SFM(Vc)	105	105	105	105	95	95	70	35	150	150	150	150	150	135	135	135	135	120	120	120	90	185
	IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0007
	RPM	34430	34430	34430	34430	30600	30600	22950	11480	36880	36880	36880	36880	36880	33200	33200	33200	33200	29510	29510	29510	22130	36060
	IPM(FEED)	30	30	30	30	24	24	14	6	44	44	44	44	44	37	37	37	37	28	28	28	19	54
	Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0000	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003
39.3	SFM(Vc)	90	90	90	90	80	80	60	30	135	135	135	135	135	120	120	120	120	110	110	110	80	170
	IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0007
	RPM	29510	29510	29510	29510	26230	26230	19670	9840	32790	32790	32790	32790	32790	29510	29510	29510	29510	26230	26230	26230	19670	32790
	IPM(FEED)	23	23	23	23	19	19	12	5	36	36	36	36	36	30	30	30	30	23	23	23	15	44
	Ap	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0003
40	SFM(Vc)	135	135	135	135	120	120	90	45	220	220	220	220	220	200	200	200	200	175	175	175	130	270
	IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0008
	RPM	44260	44260	44260	44260	39340	39340	29510	14750	53280	53280	53280	53280	53280	47950	47950	47950	47950	42620	42620	42620	31970	52460
	IPM(FEED)	45	45	45	45	34	34	23	9	71	71	71	71	71	57	57	57	57	47	47	47	30	87
	Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003
41	SFM(Vc)	120	120	120	120	110	110	80	40	185	185	185	185	185	165	165	165	165	150	150	150	110	235
	IPT(fz)	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0008
	RPM	39340	39340	39340	39340	34970	34970	26230	13110	45080	45080	45080	45080	45080	40570	40570	40570	40570	36070	36070	36070	27050	45900
	IPM(FEED)	37	37	37	37	28	28	19	8	60	60	60	60	60	48	48	48	48	40	40	40	26	76
	Ap	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003

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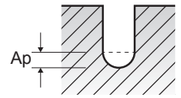
YG X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																			
			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
		LBS	1.25	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	8	10	1	1.5	2	2.5	3	3.5	4	4.5
P	5	SFM(Vc)	270	270	270	270	245	245	245	245	245	215	215	160	160	320	320	320	320	320	290	290	290
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0011	.0011	.0011	.0011	.0011	.0010	.0010	.0010
		RPM	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	51910	51910	51910	51910	51910	46720	46720	46720
		IPM(FEED)	99	99	99	99	82	82	82	82	82	63	63	42	42	119	119	119	119	119	96	96	96
		Ap	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004
	8	SFM(Vc)	270	270	270	270	245	245	245	245	245	215	215	160	160	320	320	320	320	320	290	290	290
		IPT(fz)	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0007	.0007	.0007	.0007	.0011	.0011	.0011	.0011	.0011	.0010	.0010	.0010
		RPM	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	51910	51910	51910	51910	51910	46720	46720	46720
		IPM(FEED)	99	99	99	99	82	82	82	82	82	63	63	42	42	119	119	119	119	119	96	96	96
		Ap	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004
	9	SFM(Vc)	270	270	270	270	245	245	245	245	245	215	215	160	160	320	320	320	320	320	290	290	290
		IPT(fz)	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0007	.0007	.0007	.0007	.0011	.0011	.0011	.0011	.0011	.0010	.0010	.0010
		RPM	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	51910	51910	51910	51910	51910	46720	46720	46720
		IPM(FEED)	99	99	99	99	82	82	82	82	82	63	63	42	42	119	119	119	119	119	96	96	96
		Ap	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004
	11.1	SFM(Vc)	270	270	270	270	245	245	245	245	245	215	215	160	160	320	320	320	320	320	290	290	290
		IPT(fz)	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0007	.0007	.0007	.0007	.0011	.0011	.0011	.0011	.0011	.0010	.0010	.0010
		RPM	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	51910	51910	51910	51910	51910	46720	46720	46720
		IPM(FEED)	99	99	99	99	82	82	82	82	82	63	63	42	42	119	119	119	119	119	96	96	96
		Ap	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004
	11.2	SFM(Vc)	270	270	270	270	245	245	245	245	245	215	215	160	160	320	320	320	320	320	290	290	290
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0010	.0010	.0010	.0009	.0009	.0009
		RPM	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	51910	51910	51910	51910	51910	46720	46720	46720
		IPM(FEED)	87	87	87	87	71	71	71	71	71	56	56	37	37	102	102	102	102	102	85	85	85
		Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003
H	38.1	SFM(Vc)	270	270	270	270	245	245	245	245	245	215	215	160	160	320	320	320	320	320	290	290	290
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0010	.0010	.0010	.0009	.0009	.0009
		RPM	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	51910	51910	51910	51910	51910	46720	46720	46720
		IPM(FEED)	87	87	87	87	71	71	71	71	71	56	56	37	37	102	102	102	102	102	85	85	85
		Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003
	38.2	SFM(Vc)	235	235	235	235	215	215	215	215	215	190	190	140	140	285	285	285	285	285	260	260	260
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009
		RPM	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	46450	46450	46450	46450	46450	41800	41800	41800
		IPM(FEED)	76	76	76	76	62	62	62	62	62	49	49	33	33	88	88	88	88	88	72	72	72
		Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003
	39.1	SFM(Vc)	220	220	220	220	200	200	200	200	200	175	175	130	130	255	255	255	255	255	230	230	230
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0009	.0009	.0008	.0008	.0008
		RPM	42620	42620	42620	42620	38360	38360	38360	38360	38360	34100	34100	25570	25570	40980	40980	40980	40980	40980	36890	36890	36890
		IPM(FEED)	64	64	64	64	51	51	51	51	51	40	40	26	26	74	74	74	74	74	61	61	61
		Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003
	39.2	SFM(Vc)	185	185	185	185	165	165	165	165	165	150	150	110	110	220	220	220	220	220	200	200	200
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0009	.0009	.0008	.0008	.0008
		RPM	36060	36060	36060	36060	32460	32460	32460	32460	32460	28850	28850	21640	21640	35520	35520	35520	35520	35520	31970	31970	31970
		IPM(FEED)	54	54	54	54	43	43	43	43	43	34	34	22	22	64	64	64	64	64	53	53	53
		Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003
	39.3	SFM(Vc)	170	170	170	170	150	150	150	150	150	135	135	100	100	205	205	205	205	205	180	180	180
		IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0009	.0009	.0008	.0008	.0008
		RPM	32790	32790	32790	32790	29510	29510	29510	29510	29510	26230	26230	19670	19670	32790	32790	32790	32790	32790	29510	29510	29510
		IPM(FEED)	44	44	44	44	35	35	35	35	35	29	29	19	19	57	57	57	57	57	46	46	46
		Ap	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002
	40	SFM(Vc)	270	270	270	270	245	245	245	245	245	215	215	160	160	320	320	320	320	320	290	290	290
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0010	.0010	.0010	.0009	.0009	.0009
		RPM	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	51910	51910	51910	51910	51910	46720	46720	46720
		IPM(FEED)	87	87	87	87	71	71	71	71	71	56	56	37	37	102	102	102	102	102	85	85	85
		Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003
	41	SFM(Vc)	235	235	235	235	215	215	215	215	215	190	190	140	140	285	285	285	285	285	260	260	260
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0009
		RPM	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	46450	46450	46450	46450	46450	41800	41800	41800
		IPM(FEED)	76	76	76	76	62	62	62	62	62	49	49	33	33	88	88	88	88	88	72	72	72
		Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003

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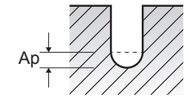
YG X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

VDI 3323	Parameter	Diameter (Ø)																				
		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
	LBS	5	5.5	6	7	8	9	10	12	2	4	6	8	2	3	4	5	6	7	8	10	12	2
5	SFM(Vc)	290	290	290	255	255	255	195	195	375	335	335	300	420	420	420	380	380	380	380	340	340	475
	IPT(fz)	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0011	.0010	.0010	.0009	.0015	.0015	.0015	.0014	.0014	.0014	.0014	.0012	.0012	.0015
	RPM	46720	46720	46720	41530	41530	41530	31150	31150	51910	46720	46720	41530	51230	51230	51230	46110	46110	46110	46110	40980	40980	51230
	IPM(FEED)	96	96	96	75	75	75	49	49	119	96	96	75	157	157	157	127	127	127	127	100	100	157
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0006	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0004	.0007
8	SFM(Vc)	290	290	290	255	255	255	195	195	375	335	335	300	420	420	420	380	380	380	380	340	340	475
	IPT(fz)	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0011	.0010	.0010	.0009	.0015	.0015	.0015	.0014	.0014	.0014	.0014	.0012	.0012	.0015
	RPM	46720	46720	46720	41530	41530	41530	31150	31150	51910	46720	46720	41530	51230	51230	51230	46110	46110	46110	46110	40980	40980	51230
	IPM(FEED)	96	96	96	75	75	75	49	49	119	96	96	75	157	157	157	127	127	127	127	100	100	157
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0006	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0004	.0007
9	SFM(Vc)	290	290	290	255	255	255	195	195	375	335	335	300	420	420	420	380	380	380	380	340	340	475
	IPT(fz)	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0011	.0010	.0010	.0009	.0015	.0015	.0015	.0014	.0014	.0014	.0014	.0012	.0012	.0015
	RPM	46720	46720	46720	41530	41530	41530	31150	31150	51910	46720	46720	41530	51230	51230	51230	46110	46110	46110	46110	40980	40980	51230
	IPM(FEED)	96	96	96	75	75	75	49	49	119	96	96	75	157	157	157	127	127	127	127	100	100	157
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0006	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0004	.0007
11.1	SFM(Vc)	290	290	290	255	255	255	195	195	375	335	335	300	420	420	420	380	380	380	380	340	340	475
	IPT(fz)	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0011	.0010	.0010	.0009	.0015	.0015	.0015	.0014	.0014	.0014	.0014	.0012	.0012	.0015
	RPM	46720	46720	46720	41530	41530	41530	31150	31150	51910	46720	46720	41530	51230	51230	51230	46110	46110	46110	46110	40980	40980	51230
	IPM(FEED)	96	96	96	75	75	75	49	49	119	96	96	75	157	157	157	127	127	127	127	100	100	157
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0006	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0004	.0007
11.2	SFM(Vc)	290	290	290	255	255	255	195	195	375	335	335	300	420	420	420	380	380	380	380	340	340	475
	IPT(fz)	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0010	.0009	.0009	.0008	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0010	.0010	.0013
	RPM	46720	46720	46720	41530	41530	41530	31150	31150	51910	46720	46720	41530	51230	51230	51230	46110	46110	46110	46110	40980	40980	51230
	IPM(FEED)	85	85	85	65	65	65	44	44	102	85	85	65	133	133	133	109	109	109	109	84	84	133
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0006
38.1	SFM(Vc)	290	290	290	255	255	255	195	195	375	335	335	300	420	420	420	380	380	380	380	340	340	475
	IPT(fz)	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0010	.0009	.0009	.0008	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0010	.0010	.0013
	RPM	46720	46720	46720	41530	41530	41530	31150	31150	51910	46720	46720	41530	51230	51230	51230	46110	46110	46110	46110	40980	40980	51230
	IPM(FEED)	85	85	85	65	65	65	44	44	102	85	85	65	133	133	133	109	109	109	109	84	84	133
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0006
38.2	SFM(Vc)	260	260	260	230	230	230	170	170	335	300	300	270	390	390	390	350	350	350	350	310	310	435
	IPT(fz)	.0009	.0009	.0009	.0007	.0007	.0007	.0007	.0007	.0009	.0009	.0009	.0007	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0010	.0010	.0013
	RPM	41800	41800	41800	37160	37160	37160	27870	27870	46450	41800	41800	37160	47130	47130	47130	42420	42420	42420	42420	37700	37700	47130
	IPM(FEED)	72	72	72	56	56	56	37	37	88	72	72	56	122	122	122	100	100	100	100	77	77	122
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0006
39.1	SFM(Vc)	230	230	230	205	205	205	150	150	295	265	265	235	340	340	340	305	305	305	305	270	270	380
	IPT(fz)	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0009	.0008	.0008	.0007	.0012	.0012	.0012	.0011	.0011	.0011	.0011	.0009	.0009	.0012
	RPM	36890	36890	36890	32790	32790	32790	24590	24590	40980	36890	36890	32790	40980	40980	40980	36890	36890	36890	36890	32790	32790	40980
	IPM(FEED)	61	61	61	46	46	46	31	31	74	61	61	46	97	97	97	78	78	78	78	62	62	97
	Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0006
39.2	SFM(Vc)	200	200	200	175	175	175	130	130	255	230	230	205	305	305	305	275	275	275	275	245	245	340
	IPT(fz)	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0009	.0008	.0008	.0007	.0012	.0012	.0012	.0011	.0011	.0011	.0011	.0009	.0009	.0012
	RPM	31970	31970	31970	28420	28420	28420	21310	21310	35520	31970	31970	28420	36880	36880	36880	33200	33200	33200	33200	29510	29510	36880
	IPM(FEED)	53	53	53	40	40	40	27	27	64	53	53	40	87	87	87	71	71	71	71	56	56	87
	Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0006
39.3	SFM(Vc)	180	180	180	160	160	160	120	120	235	215	215	190	270	270	270	245	245	245	245	215	215	305
	IPT(fz)	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0009	.0008	.0008	.0007	.0011	.0011	.0011	.0010	.0010	.0010	.0010	.0009	.0009	.0011
	RPM	29510	29510	29510	26230	26230	26230	19670	19670	32790	29510	29510	26230	32790	32790	32790	29510	29510	29510	29510	26230	26230	32790
	IPM(FEED)	46	46	46	37	37	37	23	23	57	46	46	37	75	75	75	60	60	60	60	48	48	75
	Ap	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0005
40	SFM(Vc)	290	290	290	255	255	255	195	195	375	335	335	300	420	420	420	380	380	380	380	340	340	475
	IPT(fz)	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0010	.0009	.0009	.0008	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0010	.0010	.0013
	RPM	46720	46720	46720	41530	41530	41530	31150	31150	51910	46720	46720	41530	51230	51230	51230	46110	46110	46110	46110	40980	40980	51230
	IPM(FEED)	85	85	85	65	65	65	44	44	102	85	85	65	133	133	133	109	109	109	109	84	84	133
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0006
41	SFM(Vc)	260	260	260	230	230	230	170	170	335	300	300	270	390	390	390	350	350	350	350	310	310	435
	IPT(fz)	.0009	.0009	.0009	.0007	.0007	.0007	.0007	.0007	.0009	.0009	.0009	.0007	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0010	.0010	.0013
	RPM	41800	41800	41800	37160	37160	37160	27870	27870	46450	41800	41800	37160	47130	47130	47130	42420	42420	42420	42420	37700	37700	47130
	IPM(FEED)	72	72	72	56	56	56	37	37	88	72	72	56	122	122	122	100	100	100	100	77	77	122
	Ap	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0006

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HSS
CBN END MILLS
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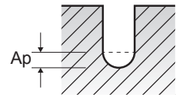
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Para-meter	Diameter (Ø)																				
			0.9	0.9	0.9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		LBS	4	6	8	2	2.5	3	4	5	6	7	8	9	10	12	13	14	16	18	20	22	25
P	5	SFM(Vc)	475	430	430	525	525	525	525	525	470	470	470	470	470	420	420	420	315	315	315	155	155
		IPT(fz)	.0013	.0014	.0014	.0019	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011
		RPM	51230	46110	46110	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	40650	40650	40650	30490	30490	30490	15250	15250
		IPM(FEED)	157	127	127	192	192	192	192	192	155	155	155	155	155	122	122	122	82	82	82	35	35
		Ap	.0006	.0006	.0005	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0002	.0002
	8	SFM(Vc)	475	430	430	525	525	525	525	525	470	470	470	470	470	420	420	420	315	315	315	155	155
		IPT(fz)	.0015	.0014	.0014	.0019	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011
		RPM	51230	46110	46110	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	40650	40650	40650	30490	30490	30490	15250	15250
		IPM(FEED)	157	127	127	192	192	192	192	192	155	155	155	155	155	122	122	122	82	82	82	35	35
		Ap	.0006	.0006	.0005	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0002	.0002
	9	SFM(Vc)	475	430	430	525	525	525	525	525	470	470	470	470	470	420	420	420	315	315	315	155	155
		IPT(fz)	.0015	.0014	.0014	.0019	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011
		RPM	51230	46110	46110	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	40650	40650	40650	30490	30490	30490	15250	15250
		IPM(FEED)	157	127	127	192	192	192	192	192	155	155	155	155	155	122	122	122	82	82	82	35	35
		Ap	.0006	.0006	.0005	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0002	.0002
	11.1	SFM(Vc)	475	430	430	525	525	525	525	525	470	470	470	470	470	420	420	420	315	315	315	155	155
		IPT(fz)	.0015	.0014	.0014	.0019	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011
		RPM	51230	46110	46110	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	40650	40650	40650	30490	30490	30490	15250	15250
		IPM(FEED)	157	127	127	192	192	192	192	192	155	155	155	155	155	122	122	122	82	82	82	35	35
		Ap	.0006	.0006	.0005	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0002	.0002
	11.2	SFM(Vc)	475	430	430	525	525	525	525	525	470	470	470	470	470	420	420	420	315	315	315	155	155
		IPT(fz)	.0013	.0012	.0012	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011	.0010	.0010
		RPM	51230	46110	46110	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	40650	40650	40650	30490	30490	30490	15250	15250
		IPM(FEED)	133	109	109	168	168	168	168	168	137	137	137	137	137	109	109	109	70	70	70	30	30
		Ap	.0005	.0005	.0004	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0003	.0003	.0002	.0002
H	38.1	SFM(Vc)	475	430	430	525	525	525	525	525	470	470	470	470	470	420	420	420	315	315	315	155	155
		IPT(fz)	.0013	.0012	.0012	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011	.0010	.0010
		RPM	51230	46110	46110	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	40650	40650	40650	30490	30490	30490	15250	15250
		IPM(FEED)	133	109	109	168	168	168	168	168	137	137	137	137	137	109	109	109	70	70	70	30	30
		Ap	.0005	.0005	.0004	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0003	.0003	.0002	.0002
	38.2	SFM(Vc)	435	395	395	475	475	475	475	475	425	425	425	425	425	380	380	380	285	285	285	140	140
		IPT(fz)	.0013	.0012	.0012	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011	.0010	.0010
		RPM	47130	42420	42420	45900	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	36720	27540	27540	27540	13770	13770
		IPM(FEED)	122	100	100	152	152	152	152	152	124	124	124	124	124	98	98	98	63	63	63	27	27
		Ap	.0005	.0005	.0004	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0003	.0003	.0002	.0002
	39.1	SFM(Vc)	380	340	340	420	420	420	420	420	380	380	380	380	380	340	340	340	255	255	255	125	125
		IPT(fz)	.0012	.0011	.0011	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0013	.0013	.0012	.0012	.0012	.0011	.0011	.0011	.0009	.0009
		RPM	40980	36890	36890	40980	40980	40980	40980	40980	36890	36890	36890	36890	36890	32790	32790	32790	24590	24590	24590	12300	12300
		IPM(FEED)	97	78	78	123	123	123	123	123	99	99	99	99	99	77	77	77	52	52	52	22	22
		Ap	.0005	.0005	.0004	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0002	.0002
	39.2	SFM(Vc)	340	310	310	370	370	370	370	370	335	335	335	335	335	295	295	295	225	225	225	110	110
		IPT(fz)	.0012	.0011	.0011	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0013	.0013	.0012	.0012	.0012	.0010	.0010	.0010	.0009	.0009
		RPM	36880	33200	33200	36060	36060	36060	36060	36060	32460	32460	32460	32460	32460	28850	28850	28850	21640	21640	21640	10820	10820
		IPM(FEED)	87	71	71	105	105	105	105	105	84	84	84	84	84	68	68	68	44	44	44	19	19
		Ap	.0005	.0005	.0004	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0002	.0002
	39.3	SFM(Vc)	305	275	275	370	370	370	370	370	335	335	335	335	335	295	295	295	225	225	225	110	110
		IPT(fz)	.0011	.0010	.0010	.0013	.0013	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0012	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008
		RPM	32790	29510	29510	36060	36060	36060	36060	36060	32460	32460	32460	32460	32460	28850	28850	28850	21640	21640	21640	10820	10820
		IPM(FEED)	75	60	60	94	94	94	94	94	77	77	77	77	77	59	59	59	39	39	39	17	17
		Ap	.0004	.0004	.0003	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0001	.0001
	40	SFM(Vc)	475	430	430	525	525	525	525	525	470	470	470	470	470	420	420	420	315	315	315	155	155
		IPT(fz)	.0013	.0012	.0012	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011	.0010	.0010
		RPM	51230	46110	46110	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	40650	40650	40650	30490	30490	30490	15250	15250
		IPM(FEED)	133	109	109	168	168	168	168	168	137	137	137	137	137	109	109	109	70	70	70	30	30
		Ap	.0005	.0005	.0004	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0003	.0003	.0002	.0002
	41	SFM(Vc)	435	395	395	475	475	475	475	475	425	425	425	425	425	380	380	380	285	285	285	140	140
		IPT(fz)	.0013	.0012	.0012	.0017	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011	.0010	.0010
		RPM	47130	42420	42420	45900	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	36720	27540	27540	27540	13770	13770
		IPM(FEED)	122	100	100	152	152	152	152	152	124	124	124	124	124	98	98	98	63	63	63	27	27
		Ap	.0005	.0005	.0004	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0003	.0003	.0002	.0002

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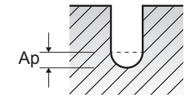
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

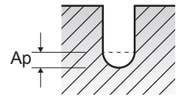
VDI 3323	Para-meter	Diameter (Ø)																					
		1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	LBS	30	2.4	4	6	8	10	12	14	16	8	12	16	3	3.8	4	6	8	10	12	14	15	16
5	SFM(Vc)	155	640	640	640	580	580	580	515	515	645	645	575	795	795	795	795	715	715	715	715	715	635
	IPT(fz)	.0011	.0020	.0020	.0020	.0018	.0018	.0018	.0016	.0016	.0019	.0019	.0017	.0021	.0021	.0021	.0021	.0019	.0019	.0019	.0019	.0019	.0017
	RPM	15250	51910	51910	51910	46720	46720	46720	41530	41530	44810	44810	39830	51370	51370	51370	51370	46230	46230	46230	46230	46230	41090
	IPM(FEED)	35	208	208	208	169	169	169	134	134	169	169	132	218	218	218	218	178	178	178	178	178	139
	Ap	.0002	.0009	.0009	.0009	.0008	.0007	.0007	.0007	.0006	.0009	.0008	.0008	.0012	.0012	.0012	.0011	.0009	.0009	.0009	.0008	.0008	.0008
8	SFM(Vc)	155	640	640	640	580	580	580	515	515	645	645	575	795	795	795	795	715	715	715	715	715	635
	IPT(fz)	.0011	.0020	.0020	.0020	.0018	.0018	.0018	.0016	.0016	.0019	.0019	.0017	.0021	.0021	.0021	.0021	.0019	.0019	.0019	.0019	.0019	.0017
	RPM	15250	51910	51910	51910	46720	46720	46720	41530	41530	44810	44810	39830	51370	51370	51370	51370	46230	46230	46230	46230	46230	41090
	IPM(FEED)	35	208	208	208	169	169	169	134	134	169	169	132	218	218	218	218	178	178	178	178	178	139
	Ap	.0002	.0009	.0009	.0009	.0008	.0007	.0007	.0007	.0006	.0009	.0008	.0008	.0012	.0012	.0012	.0011	.0009	.0009	.0009	.0008	.0008	.0008
9	SFM(Vc)	155	640	640	640	580	580	580	515	515	645	645	575	795	795	795	795	715	715	715	715	715	635
	IPT(fz)	.0011	.0020	.0020	.0020	.0018	.0018	.0018	.0016	.0016	.0019	.0019	.0017	.0021	.0021	.0021	.0021	.0019	.0019	.0019	.0019	.0019	.0017
	RPM	15250	51910	51910	51910	46720	46720	46720	41530	41530	44810	44810	39830	51370	51370	51370	51370	46230	46230	46230	46230	46230	41090
	IPM(FEED)	35	208	208	208	169	169	169	134	134	169	169	132	218	218	218	218	178	178	178	178	178	139
	Ap	.0002	.0009	.0009	.0009	.0008	.0007	.0007	.0007	.0006	.0009	.0008	.0008	.0012	.0012	.0012	.0011	.0009	.0009	.0009	.0008	.0008	.0008
11.1	SFM(Vc)	155	640	640	640	580	580	580	515	515	645	645	575	795	795	795	795	715	715	715	715	715	635
	IPT(fz)	.0011	.0020	.0020	.0020	.0018	.0018	.0018	.0016	.0016	.0019	.0019	.0017	.0021	.0021	.0021	.0021	.0019	.0019	.0019	.0019	.0019	.0017
	RPM	15250	51910	51910	51910	46720	46720	46720	41530	41530	44810	44810	39830	51370	51370	51370	51370	46230	46230	46230	46230	46230	41090
	IPM(FEED)	35	208	208	208	169	169	169	134	134	169	169	132	218	218	218	218	178	178	178	178	178	139
	Ap	.0002	.0009	.0009	.0009	.0008	.0007	.0007	.0007	.0006	.0009	.0008	.0008	.0012	.0012	.0012	.0011	.0009	.0009	.0009	.0008	.0008	.0008
11.2	SFM(Vc)	155	610	610	610	545	545	545	485	485	620	620	550	760	760	760	760	685	685	685	685	685	610
	IPT(fz)	.0010	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0016	.0016	.0014	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015
	RPM	15250	49180	49180	49180	44260	44260	44260	39340	39340	42970	42970	38200	49180	49180	49180	49180	44260	44260	44260	44260	44260	39340
	IPM(FEED)	30	174	174	174	141	141	141	112	112	140	140	111	182	182	182	182	146	146	146	146	146	118
	Ap	.0002	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0005	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0008	.0008	.0008	.0007	.0007	.0007
38.1	SFM(Vc)	155	610	610	610	545	545	545	485	485	620	620	550	760	760	760	760	685	685	685	685	685	610
	IPT(fz)	.0010	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0016	.0016	.0014	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015
	RPM	15250	49180	49180	49180	44260	44260	44260	39340	39340	42970	42970	38200	49180	49180	49180	49180	44260	44260	44260	44260	44260	39340
	IPM(FEED)	30	174	174	174	141	141	141	112	112	140	140	111	182	182	182	182	146	146	146	146	146	118
	Ap	.0002	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0005	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0008	.0008	.0008	.0007	.0007	.0007
38.2	SFM(Vc)	140	540	540	540	485	485	485	435	435	565	565	500	695	695	695	695	625	625	625	625	625	555
	IPT(fz)	.0010	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0016	.0016	.0015	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015
	RPM	13770	43710	43710	43710	39340	39340	39340	34970	34970	39080	39080	34740	44810	44810	44810	44810	40330	40330	40330	40330	40330	35850
	IPM(FEED)	27	155	155	155	127	127	127	99	99	126	126	101	166	166	166	166	133	133	133	133	133	107
	Ap	.0002	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0005	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0008	.0008	.0008	.0007	.0007	.0007
39.1	SFM(Vc)	125	490	490	490	440	440	440	390	390	480	480	430	590	590	590	590	530	530	530	530	530	475
	IPT(fz)	.0009	.0015	.0015	.0015	.0014	.0014	.0014	.0012	.0012	.0015	.0015	.0013	.0017	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013
	RPM	12300	39620	39620	39620	35650	35650	35650	31690	31690	33350	33350	29650	38250	38250	38250	38250	34430	34430	34430	34430	34430	30600
	IPM(FEED)	22	122	122	122	98	98	98	77	77	97	97	77	126	126	126	126	103	103	103	103	103	82
	Ap	.0002	.0008	.0007	.0007	.0006	.0005	.0005	.0005	.0005	.0007	.0006	.0006	.0009	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007
39.2	SFM(Vc)	110	440	440	440	395	395	395	350	350	425	425	380	525	525	525	525	470	470	470	470	470	420
	IPT(fz)	.0009	.0016	.0016	.0016	.0014	.0014	.0014	.0013	.0013	.0015	.0015	.0013	.0016	.0016	.0016	.0016	.0015	.0015	.0015	.0015	.0015	.0013
	RPM	10820	35520	35520	35520	31970	31970	31970	28420	28420	29470	29470	26190	33880	33880	33880	33880	30490	30490	30490	30490	30490	27100
	IPM(FEED)	19	112	112	112	91	91	91	72	72	86	86	68	109	109	109	109	89	89	89	89	89	70
	Ap	.0002	.0008	.0007	.0007	.0006	.0005	.0005	.0005	.0005	.0007	.0006	.0006	.0009	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007
39.3	SFM(Vc)	110	390	390	390	350	350	350	310	310	385	385	340	475	475	475	475	425	425	425	425	425	380
	IPT(fz)	.0008	.0015	.0015	.0015	.0013	.0013	.0013	.0012	.0012	.0014	.0014	.0012	.0015	.0015	.0015	.0015	.0014	.0014	.0014	.0014	.0014	.0012
	RPM	10820	31420	31420	31420	28280	28280	28280	25140	25140	26600	26600	23650	30600	30600	30600	30600	27540	27540	27540	27540	27540	24480
	IPM(FEED)	17	94	94	94	76	76	76	59	59	73	73	58	94	94	94	94	76	76	76	76	76	60
	Ap	.0001	.0006	.0006	.0006	.0005	.0004	.0004	.0004	.0004	.0006	.0005	.0005	.0008	.0008	.0008	.0007	.0006	.0006	.0006	.0005	.0005	.0005
40	SFM(Vc)	155	610	610	610	545	545	545	485	485	620	620	550	760	760	760	760	685	685	685	685	685	610
	IPT(fz)	.0010	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0016	.0016	.0014	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015
	RPM	15250	49180	49180	49180	44260	44260	44260	39340	39340	42970	42970	38200	49180	49180	49180	49180	44260	44260	44260	44260	44260	39340
	IPM(FEED)	30	174	174	174	141	141	141	112	112	140	140	111	182	182	182	182	146	146	146	146	146	118
	Ap	.0002	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0005	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0008	.0008	.0008	.0007	.0007	.0007
41	SFM(Vc)	140	540	540	540	485	485	485	435	435	565	565	500	695	695	695	695	625	625	625	625	625	555
	IPT(fz)	.0010	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0016	.0016	.0015	.0019	.0019	.0019	.0019	.0017	.0017	.0017	.0017	.0017	.0015
	RPM	13770	43710	43710	43710	39340	39340	39340	34970	34970	39080	39080	34740	44810	44810	44810	44810	40330	40330	40330	40330	40330	35850
	IPM(FEED)	27	155	155	155	127	127	127	99	99	126	126	101	166	166	166	166	133	133	133	133	133	107
	Ap	.0002	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0005	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0008	.0008	.0008	.0007	.0007	.0007

▶NEXT PAGE

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Para-meter	Diameter (Ø)																			
			1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	2	2	2	2	2	2	2	2	2	2	2
			LBS	18	20	22	25	30	8	12	16	20	3	4	6	8	10	12	13	14	16	18	20	22
P	5	SFM(Vc)	635	635	635	475	475	845	760	760	675	1045	1045	1045	1045	1045	945	945	945	945	945	945	840
		IPT(fz)	.0017	.0017	.0017	.0015	.0015	.0022	.0020	.0020	.0017	.0022	.0022	.0022	.0022	.0022	.0020	.0020	.0020	.0020	.0020	.0020	.0018
		RPM	41090	41090	41090	30820	30820	51230	46110	46110	40980	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	45740	40650
		IPM(FEED)	139	139	139	92	92	222	182	182	142	228	228	228	228	228	184	184	184	184	184	184	147
		Ap	.0008	.0008	.0008	.0006	.0006	.0011	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0013	.0013	.0013	.0013	.0011	.0011	.0011
	8	SFM(Vc)	635	635	635	475	475	845	760	760	675	1045	1045	1045	1045	1045	945	945	945	945	945	945	840
		IPT(fz)	.0017	.0017	.0017	.0015	.0015	.0022	.0020	.0020	.0017	.0022	.0022	.0022	.0022	.0022	.0020	.0020	.0020	.0020	.0020	.0020	.0018
		RPM	41090	41090	41090	30820	30820	51230	46110	46110	40980	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	45740	40650
		IPM(FEED)	139	139	139	92	92	222	182	182	142	228	228	228	228	228	184	184	184	184	184	184	147
		Ap	.0008	.0008	.0008	.0006	.0006	.0011	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0013	.0013	.0013	.0013	.0011	.0011	.0011
	9	SFM(Vc)	635	635	635	475	475	845	760	760	675	1045	1045	1045	1045	1045	945	945	945	945	945	945	840
		IPT(fz)	.0017	.0017	.0017	.0015	.0015	.0022	.0020	.0020	.0017	.0022	.0022	.0022	.0022	.0022	.0020	.0020	.0020	.0020	.0020	.0020	.0018
		RPM	41090	41090	41090	30820	30820	51230	46110	46110	40980	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	45740	40650
		IPM(FEED)	139	139	139	92	92	222	182	182	142	228	228	228	228	228	184	184	184	184	184	184	147
		Ap	.0008	.0008	.0008	.0006	.0006	.0011	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0013	.0013	.0013	.0013	.0011	.0011	.0011
	11.1	SFM(Vc)	635	635	635	475	475	845	760	760	675	1045	1045	1045	1045	1045	945	945	945	945	945	945	840
		IPT(fz)	.0017	.0017	.0017	.0015	.0015	.0022	.0020	.0020	.0017	.0022	.0022	.0022	.0022	.0022	.0020	.0020	.0020	.0020	.0020	.0020	.0018
		RPM	41090	41090	41090	30820	30820	51230	46110	46110	40980	50820	50820	50820	50820	50820	45740	45740	45740	45740	45740	45740	40650
		IPM(FEED)	139	139	139	92	92	222	182	182	142	228	228	228	228	228	184	184	184	184	184	184	147
		Ap	.0008	.0008	.0008	.0006	.0006	.0011	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0013	.0013	.0013	.0013	.0011	.0011	.0011
	11.2	SFM(Vc)	610	610	610	455	455	810	730	730	650	1015	1015	1015	1015	1015	910	910	910	910	910	910	810
		IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0019	.0017	.0017	.0015	.0020	.0020	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0018	.0016
		RPM	39340	39340	39340	29510	29510	49180	44260	44260	39340	49180	49180	49180	49180	49180	44260	44260	44260	44260	44260	44260	39340
		IPM(FEED)	118	118	118	77	77	186	150	150	118	194	194	194	194	194	157	157	157	157	157	157	124
		Ap	.0007	.0007	.0007	.0005	.0005	.0010	.0009	.0007	.0007	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0011	.0009	.0009	.0009
	38.1	SFM(Vc)	610	610	610	455	455	810	730	730	650	1015	1015	1015	1015	1015	910	910	910	910	910	910	810
		IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0019	.0017	.0017	.0015	.0020	.0020	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0018	.0016
		RPM	39340	39340	39340	29510	29510	49180	44260	44260	39340	49180	49180	49180	49180	49180	44260	44260	44260	44260	44260	44260	39340
		IPM(FEED)	118	118	118	77	77	186	150	150	118	194	194	194	194	194	157	157	157	157	157	157	124
		Ap	.0007	.0007	.0007	.0005	.0005	.0010	.0009	.0007	.0007	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0011	.0009	.0009	.0009
	38.2	SFM(Vc)	555	555	555	415	415	735	665	665	590	845	845	845	845	845	760	760	760	760	760	760	675
		IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0019	.0017	.0017	.0015	.0020	.0020	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0018	.0016
		RPM	35850	35850	35850	26880	26880	44670	40200	40200	35740	40980	40980	40980	40980	40980	36890	36890	36890	36890	36890	36890	32790
		IPM(FEED)	107	107	107	70	70	169	136	136	107	161	161	161	161	161	131	131	131	131	131	131	103
		Ap	.0007	.0007	.0007	.0005	.0005	.0010	.0009	.0007	.0007	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0011	.0009	.0009	.0009
	39.1	SFM(Vc)	475	475	475	355	355	630	565	565	505	745	745	745	745	745	670	670	670	670	670	670	595
		IPT(fz)	.0013	.0013	.0013	.0011	.0011	.0017	.0015	.0015	.0013	.0018	.0018	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0016	.0014
		RPM	30600	30600	30600	22950	22950	38110	34300	34300	30490	36060	36060	36060	36060	36060	32460	32460	32460	32460	32460	32460	28850
		IPM(FEED)	82	82	82	52	52	129	105	105	82	128	128	128	128	128	105	105	105	105	105	105	82
		Ap	.0007	.0006	.0006	.0005	.0005	.0009	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0010	.0010	.0010	.0009	.0009	.0009
H	39.2	SFM(Vc)	420	420	420	315	315	560	500	500	445	675	675	675	675	675	610	610	610	610	610	610	540
		IPT(fz)	.0013	.0013	.0013	.0011	.0011	.0017	.0015	.0015	.0013	.0017	.0017	.0017	.0017	.0017	.0016	.0016	.0016	.0016	.0016	.0016	.0014
		RPM	27100	27100	27100	20330	20330	33810	30430	30430	27050	32790	32790	32790	32790	32790	29510	29510	29510	29510	29510	29510	26230
		IPM(FEED)	70	70	70	46	46	114	93	93	72	114	114	114	114	114	93	93	93	93	93	93	72
		Ap	.0007	.0006	.0006	.0005	.0005	.0009	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0010	.0010	.0010	.0009	.0009	.0009
	39.3	SFM(Vc)	380	380	380	285	285	505	455	455	405	610	610	610	610	610	545	545	545	545	545	545	485
		IPT(fz)	.0012	.0012	.0012	.0011	.0011	.0015	.0014	.0014	.0012	.0016	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0014	.0014	.0014	.0013
		RPM	24480	24480	24480	18360	18360	30530	27480	27480	24430	29510	29510	29510	29510	29510	26560	26560	26560	26560	26560	26560	23610
		IPM(FEED)	60	60	60	39	39	94	76	76	60	93	93	93	93	93	75	75	75	75	75	75	59
		Ap	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007	.0007
	40	SFM(Vc)	610	610	610	455	455	810	730	730	650	1015	1015	1015	1015	1015	910	910	910	910	910	910	810
		IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0019	.0017	.0017	.0015	.0020	.0020	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0018	.0016
		RPM	39340	39340	39340	29510	29510	49180	44260	44260	39340	49180	49180	49180	49180	49180	44260	44260	44260	44260	44260	44260	39340
		IPM(FEED)	118	118	118	77	77	186	150	150	118	194	194	194	194	194	157	157	157	157	157	157	124
		Ap	.0007	.0007	.0007	.0005	.0005	.0010	.0009	.0007	.0007	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0011	.0009	.0009	.0009
	41	SFM(Vc)	555	555	555	415	415	735	665	665	590	845	845	845	845	845	760	760	760	760	760	760	675
		IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0019	.0017	.0017	.0015	.0020	.0020	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0018	.0016
		RPM	35850	35850	35850	26880	26880	44670	40200	40200	35740	40980	40980	40980	40980	40980	36890	36890	36890	36890	36890	36890	32790
		IPM(FEED)	107	107	107	70	70	169	136	136	107	161	161	161	161	161	131	131	131	131	131	131	103
		Ap	.0007	.0007	.0007	.0005	.0005	.0010	.0009	.0007	.0007	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0011	.0009	.0009	.0009

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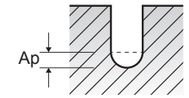
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

VDI 3323	Para-meter	Diameter (Ø)																				
		2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	3	3	3	3
	LBS	25	30	35	40	50	6	8	10	15	20	25	30	35	6	8	10	12	14	15	16	20	25
5	SFM(Vc)	840	840	630	630	315	1050	1050	1050	945	945	945	840	840	1050	1050	1050	1050	1050	1050	945	945	945
	IPT(fz)	.0018	.0018	.0016	.0016	.0013	.0029	.0029	.0029	.0026	.0026	.0026	.0023	.0023	.0036	.0036	.0036	.0036	.0036	.0036	.0032	.0032	.0032
	RPM	40650	40650	30490	30490	15250	40690	40690	40690	36620	36620	36620	32550	32550	33880	33880	33880	33880	33880	33880	30490	30490	30490
	IPM(FEED)	147	147	96	96	41	237	237	237	190	190	190	151	151	243	243	243	243	243	243	197	197	197
	Ap	.0011	.0010	.0008	.0008	.0004	.0020	.0018	.0018	.0016	.0016	.0014	.0014	.0013	.0024	.0024	.0021	.0021	.0021	.0021	.0019	.0019	.0017
8	SFM(Vc)	840	840	630	630	315	1050	1050	1050	945	945	945	840	840	1050	1050	1050	1050	1050	1050	945	945	945
	IPT(fz)	.0018	.0018	.0016	.0016	.0013	.0029	.0029	.0029	.0026	.0026	.0026	.0023	.0023	.0036	.0036	.0036	.0036	.0036	.0036	.0032	.0032	.0032
	RPM	40650	40650	30490	30490	15250	40690	40690	40690	36620	36620	36620	32550	32550	33880	33880	33880	33880	33880	33880	30490	30490	30490
	IPM(FEED)	147	147	96	96	41	237	237	237	190	190	190	151	151	243	243	243	243	243	243	197	197	197
	Ap	.0011	.0010	.0008	.0008	.0004	.0020	.0018	.0018	.0016	.0016	.0014	.0014	.0013	.0024	.0024	.0021	.0021	.0021	.0021	.0019	.0019	.0017
9	SFM(Vc)	840	840	630	630	315	1050	1050	1050	945	945	945	840	840	1050	1050	1050	1050	1050	1050	945	945	945
	IPT(fz)	.0018	.0018	.0016	.0016	.0013	.0029	.0029	.0029	.0026	.0026	.0026	.0023	.0023	.0036	.0036	.0036	.0036	.0036	.0036	.0032	.0032	.0032
	RPM	40650	40650	30490	30490	15250	40690	40690	40690	36620	36620	36620	32550	32550	33880	33880	33880	33880	33880	33880	30490	30490	30490
	IPM(FEED)	147	147	96	96	41	237	237	237	190	190	190	151	151	243	243	243	243	243	243	197	197	197
	Ap	.0011	.0010	.0008	.0008	.0004	.0020	.0018	.0018	.0016	.0016	.0014	.0014	.0013	.0024	.0024	.0021	.0021	.0021	.0021	.0019	.0019	.0017
11.1	SFM(Vc)	840	840	630	630	315	1050	1050	1050	945	945	945	840	840	1050	1050	1050	1050	1050	1050	945	945	945
	IPT(fz)	.0018	.0018	.0016	.0016	.0013	.0029	.0029	.0029	.0026	.0026	.0026	.0023	.0023	.0036	.0036	.0036	.0036	.0036	.0036	.0032	.0032	.0032
	RPM	40650	40650	30490	30490	15250	40690	40690	40690	36620	36620	36620	32550	32550	33880	33880	33880	33880	33880	33880	30490	30490	30490
	IPM(FEED)	147	147	96	96	41	237	237	237	190	190	190	151	151	243	243	243	243	243	243	197	197	197
	Ap	.0011	.0010	.0008	.0008	.0004	.0020	.0018	.0018	.0016	.0016	.0014	.0014	.0013	.0024	.0024	.0021	.0021	.0021	.0021	.0019	.0019	.0017
11.2	SFM(Vc)	810	810	610	610	305	1010	1010	1010	910	910	910	810	810	1015	1015	1015	1015	1015	1015	910	910	910
	IPT(fz)	.0016	.0016	.0014	.0014	.0012	.0026	.0026	.0026	.0023	.0023	.0023	.0021	.0021	.0033	.0033	.0033	.0033	.0033	.0033	.0030	.0030	.0030
	RPM	39340	39340	29510	29510	14750	39300	39300	39300	35370	35370	35370	31440	31440	32790	32790	32790	32790	32790	32790	29510	29510	29510
	IPM(FEED)	124	124	81	81	35	204	204	204	164	164	164	131	131	214	214	214	214	214	214	174	174	174
	Ap	.0009	.0009	.0007	.0007	.0003	.0017	.0015	.0015	.0013	.0013	.0012	.0012	.0011	.0020	.0020	.0018	.0018	.0018	.0018	.0016	.0016	.0014
38.1	SFM(Vc)	810	810	610	610	305	1010	1010	1010	910	910	910	810	810	1015	1015	1015	1015	1015	1015	910	910	910
	IPT(fz)	.0016	.0016	.0014	.0014	.0012	.0026	.0026	.0026	.0023	.0023	.0023	.0021	.0021	.0033	.0033	.0033	.0033	.0033	.0033	.0030	.0030	.0030
	RPM	39340	39340	29510	29510	14750	39300	39300	39300	35370	35370	35370	31440	31440	32790	32790	32790	32790	32790	32790	29510	29510	29510
	IPM(FEED)	124	124	81	81	35	204	204	204	164	164	164	131	131	214	214	214	214	214	214	174	174	174
	Ap	.0009	.0009	.0007	.0007	.0003	.0017	.0015	.0015	.0013	.0013	.0012	.0012	.0011	.0020	.0020	.0018	.0018	.0018	.0018	.0016	.0016	.0014
38.2	SFM(Vc)	675	675	505	505	255	845	845	845	760	760	760	675	675	845	845	845	845	845	845	760	760	760
	IPT(fz)	.0016	.0016	.0014	.0014	.0012	.0025	.0025	.0025	.0022	.0022	.0022	.0020	.0020	.0030	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0027
	RPM	32790	32790	24590	24590	12300	32750	32750	32750	29480	29480	29480	26200	26200	27320	27320	27320	27320	27320	27320	24590	24590	24590
	IPM(FEED)	103	103	68	68	29	162	162	162	130	130	130	103	103	161	161	161	161	161	161	132	132	132
	Ap	.0009	.0009	.0007	.0007	.0003	.0017	.0015	.0015	.0013	.0013	.0012	.0012	.0011	.0020	.0020	.0018	.0018	.0018	.0018	.0016	.0016	.0014
39.1	SFM(Vc)	595	595	445	445	225	745	745	745	670	670	670	595	595	745	745	745	745	745	745	670	670	670
	IPT(fz)	.0014	.0014	.0013	.0013	.0011	.0022	.0022	.0022	.0020	.0020	.0020	.0018	.0018	.0026	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024
	RPM	28850	28850	21640	21640	10820	28840	28840	28840	25960	25960	25960	23070	23070	24040	24040	24040	24040	24040	24040	21640	21640	21640
	IPM(FEED)	82	82	55	55	23	127	127	127	102	102	102	82	82	127	127	127	127	127	127	102	102	102
	Ap	.0009	.0008	.0006	.0006	.0003	.0016	.0014	.0014	.0013	.0013	.0011	.0011	.0010	.0019	.0019	.0017	.0017	.0017	.0017	.0015	.0015	.0013
39.2	SFM(Vc)	540	540	405	405	205	675	675	675	610	610	610	540	540	675	675	675	675	675	675	610	610	610
	IPT(fz)	.0014	.0014	.0012	.0012	.0010	.0022	.0022	.0022	.0020	.0020	.0020	.0017	.0017	.0026	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024
	RPM	26230	26230	19670	19670	9840	26270	26270	26270	23640	23640	23640	21010	21010	21860	21860	21860	21860	21860	21860	19670	19670	19670
	IPM(FEED)	72	72	48	48	20	114	114	114	93	93	93	73	73	115	115	115	115	115	115	93	93	93
	Ap	.0009	.0008	.0006	.0006	.0003	.0016	.0014	.0014	.0013	.0013	.0011	.0011	.0010	.0019	.0019	.0017	.0017	.0017	.0017	.0015	.0015	.0013
39.3	SFM(Vc)	485	485	365	365	180	610	610	610	545	545	545	485	485	610	610	610	610	610	610	545	545	545
	IPT(fz)	.0013	.0013	.0011	.0011	.0009	.0020	.0020	.0020	.0018	.0018	.0018	.0016	.0016	.0024	.0024	.0024	.0024	.0024	.0024	.0022	.0022	.0022
	RPM	23610	23610	17700	17700	8850	23590	23590	23590	21230	21230	21230	18870	18870	19670	19670	19670	19670	19670	19670	17710	17710	17710
	IPM(FEED)	59	59	39	39	17	95	95	95	75	75	75	59	59	94	94	94	94	94	94	77	77	77
	Ap	.0007	.0007	.0005	.0005	.0003	.0013	.0012	.0012	.0010	.0010	.0009	.0009	.0008	.0015	.0015	.0014	.0014	.0014	.0014	.0012	.0012	.0011
40	SFM(Vc)	810	810	610	610	305	1010	1010	1010	910	910	910	810	810	1015	1015	1015	1015	1015	1015	910	910	910
	IPT(fz)	.0016	.0016	.0014	.0014	.0012	.0026	.0026	.0026	.0023	.0023	.0023	.0021	.0021	.0033	.0033	.0033	.0033	.0033	.0033	.0030	.0030	.0030
	RPM	39340	39340	29510	29510	14750	39300	39300	39300	35370	35370	35370	31440	31440	32790	32790	32790	32790	32790	32790	29510	29510	29510
	IPM(FEED)	124	124	81	81	35	204	204	204	164	164	164	131	131	214	214	214	214	214	214	174	174	174
	Ap	.0009	.0009	.0007	.0007	.0003	.0017	.0015	.0015	.0013	.0013	.0012	.0012	.0011	.0020	.0020	.0018	.0018	.0018	.0018	.0016	.0016	.0014
41	SFM(Vc)	675	675	505	505	255	845	845	845	760	760	760	675	675	845	845	845	845	845	845	760	760	760
	IPT(fz)	.0016	.0016	.0014	.0014	.0012	.0025	.0025	.0025	.0022	.0022	.0022	.0020	.0020	.0030	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0027
	RPM	32790	32790	24590	24590	12300	32750	32750	32750	29480	29480	29480	26200	26200	27320	27320	27320	27320	27320	27320	24590	24590	24590
	IPM(FEED)	103	103	68	68	29	162	162	162	130	130	130	103	103	161	161	161	161	161	161	132	132	132
	Ap	.0009	.0009	.0007	.0007	.0003	.0017	.0015	.0015	.0013	.0013	.0012	.0012	.0011	.0020	.0020	.0018	.0018	.0018	.0018	.0016	.0016	.0014

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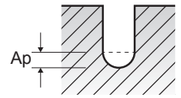
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

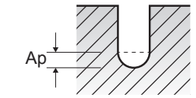
ISO	VDI 3323	Parameter	Diameter (Ø)																				
			3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	4	4	4	4	4	4
		LBS	30	35	40	50	15	20	25	30	35	40	45	8	10	12	14	15	20	25	30	35	40
P	5	SFM(Vc)	945	840	840	630	1065	960	960	960	960	850	850	1065	1065	1065	1065	1065	1065	960	960	960	960
		IPT(fz)	.0032	.0029	.0029	.0025	.0041	.0037	.0037	.0037	.0037	.0033	.0033	.0047	.0047	.0047	.0047	.0047	.0047	.0043	.0043	.0043	.0043
		RPM	30490	27100	27100	20330	29510	26560	26560	26560	26560	23610	23610	25820	25820	25820	25820	25820	25820	23240	23240	23240	23240
		IPM(FEED)	197	156	156	102	244	197	197	197	197	156	156	244	244	244	244	244	244	198	198	198	198
		Ap	.0017	.0017	.0015	.0012	.0025	.0022	.0022	.0019	.0019	.0019	.0019	.0031	.0031	.0031	.0028	.0028	.0028	.0025	.0025	.0022	.0022
	8	SFM(Vc)	945	840	840	630	1065	960	960	960	960	850	850	1065	1065	1065	1065	1065	1065	960	960	960	960
		IPT(fz)	.0032	.0029	.0029	.0025	.0041	.0037	.0037	.0037	.0037	.0033	.0033	.0047	.0047	.0047	.0047	.0047	.0047	.0043	.0043	.0043	.0043
		RPM	30490	27100	27100	20330	29510	26560	26560	26560	26560	23610	23610	25820	25820	25820	25820	25820	25820	23240	23240	23240	23240
		IPM(FEED)	197	156	156	102	244	197	197	197	197	156	156	244	244	244	244	244	244	198	198	198	198
		Ap	.0017	.0017	.0015	.0012	.0025	.0022	.0022	.0019	.0019	.0019	.0019	.0031	.0031	.0031	.0028	.0028	.0028	.0025	.0025	.0022	.0022
	9	SFM(Vc)	945	840	840	630	1065	960	960	960	960	850	850	1065	1065	1065	1065	1065	1065	960	960	960	960
		IPT(fz)	.0032	.0029	.0029	.0025	.0041	.0037	.0037	.0037	.0037	.0033	.0033	.0047	.0047	.0047	.0047	.0047	.0047	.0043	.0043	.0043	.0043
		RPM	30490	27100	27100	20330	29510	26560	26560	26560	26560	23610	23610	25820	25820	25820	25820	25820	25820	23240	23240	23240	23240
		IPM(FEED)	197	156	156	102	244	197	197	197	197	156	156	244	244	244	244	244	244	198	198	198	198
		Ap	.0017	.0017	.0015	.0012	.0025	.0022	.0022	.0019	.0019	.0019	.0019	.0031	.0031	.0031	.0028	.0028	.0028	.0025	.0025	.0022	.0022
	11.1	SFM(Vc)	945	840	840	630	1065	960	960	960	960	850	850	1065	1065	1065	1065	1065	1065	960	960	960	960
		IPT(fz)	.0032	.0029	.0029	.0025	.0041	.0037	.0037	.0037	.0037	.0033	.0033	.0047	.0047	.0047	.0047	.0047	.0047	.0043	.0043	.0043	.0043
		RPM	30490	27100	27100	20330	29510	26560	26560	26560	26560	23610	23610	25820	25820	25820	25820	25820	25820	23240	23240	23240	23240
		IPM(FEED)	197	156	156	102	244	197	197	197	197	156	156	244	244	244	244	244	244	198	198	198	198
		Ap	.0017	.0017	.0015	.0012	.0025	.0022	.0022	.0019	.0019	.0019	.0019	.0031	.0031	.0031	.0028	.0028	.0028	.0025	.0025	.0022	.0022
	11.2	SFM(Vc)	910	810	810	610	1010	910	910	910	910	810	810	1015	1015	1015	1015	1015	1015	910	910	910	910
		IPT(fz)	.0030	.0026	.0026	.0023	.0038	.0034	.0034	.0034	.0034	.0031	.0031	.0044	.0044	.0044	.0044	.0044	.0044	.0039	.0039	.0039	.0039
		RPM	29510	26230	26230	19670	28070	25260	25260	25260	25260	22450	22450	24590	24590	24590	24590	24590	24590	22130	22130	22130	22130
		IPM(FEED)	174	136	136	90	214	173	173	173	173	138	138	215	215	215	215	215	215	174	174	174	174
		Ap	.0014	.0014	.0013	.0010	.0021	.0019	.0019	.0016	.0016	.0016	.0016	.0027	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0019	.0019
H	38.1	SFM(Vc)	910	810	810	610	1010	910	910	910	910	810	810	1015	1015	1015	1015	1015	1015	910	910	910	910
		IPT(fz)	.0030	.0026	.0026	.0023	.0038	.0034	.0034	.0034	.0034	.0031	.0031	.0044	.0044	.0044	.0044	.0044	.0044	.0039	.0039	.0039	.0039
		RPM	29510	26230	26230	19670	28070	25260	25260	25260	25260	22450	22450	24590	24590	24590	24590	24590	24590	22130	22130	22130	22130
		IPM(FEED)	174	136	136	90	214	173	173	173	173	138	138	215	215	215	215	215	215	174	174	174	174
		Ap	.0014	.0014	.0013	.0010	.0021	.0019	.0019	.0016	.0016	.0016	.0016	.0027	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0019	.0019
	38.2	SFM(Vc)	760	675	675	505	845	760	760	760	760	675	675	845	845	845	845	845	845	760	760	760	760
		IPT(fz)	.0027	.0024	.0024	.0021	.0034	.0031	.0031	.0031	.0031	.0028	.0028	.0039	.0039	.0039	.0039	.0039	.0039	.0035	.0035	.0035	.0035
		RPM	24590	21860	21860	16390	23430	21090	21090	21090	21090	18750	18750	20490	20490	20490	20490	20490	20490	18440	18440	18440	18440
		IPM(FEED)	132	103	103	68	161	131	131	131	131	103	103	161	161	161	161	161	161	131	131	131	131
		Ap	.0014	.0014	.0013	.0010	.0021	.0019	.0019	.0016	.0016	.0016	.0016	.0027	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0019	.0019
	39.1	SFM(Vc)	670	595	595	445	745	670	670	670	670	595	595	745	745	745	745	745	745	670	670	670	670
		IPT(fz)	.0024	.0021	.0021	.0019	.0031	.0028	.0028	.0028	.0028	.0025	.0025	.0035	.0035	.0035	.0035	.0035	.0035	.0032	.0032	.0032	.0032
		RPM	21640	19230	19230	14430	20600	18540	18540	18540	18540	16480	16480	18030	18030	18030	18030	18030	18030	16230	16230	16230	16230
		IPM(FEED)	102	82	82	53	128	104	104	104	104	82	82	128	128	128	128	128	128	104	104	104	104
		Ap	.0013	.0013	.0012	.0009	.0020	.0018	.0018	.0015	.0015	.0015	.0015	.0025	.0025	.0025	.0023	.0023	.0023	.0020	.0020	.0018	.0018
	39.2	SFM(Vc)	610	540	540	405	675	610	610	610	610	540	540	675	675	675	675	675	675	610	610	610	610
		IPT(fz)	.0024	.0021	.0021	.0019	.0031	.0028	.0028	.0028	.0028	.0024	.0024	.0035	.0035	.0035	.0035	.0035	.0035	.0031	.0031	.0031	.0031
		RPM	19670	17490	17490	13120	18750	16870	16870	16870	16870	15000	15000	16390	16390	16390	16390	16390	16390	14750	14750	14750	14750
		IPM(FEED)	93	74	74	49	115	93	93	93	93	73	73	114	114	114	114	114	114	92	92	92	92
		Ap	.0013	.0013	.0012	.0009	.0020	.0018	.0018	.0015	.0015	.0015	.0015	.0025	.0025	.0025	.0023	.0023	.0023	.0020	.0020	.0018	.0018
	39.3	SFM(Vc)	545	485	485	365	610	550	550	550	550	485	485	610	610	610	610	610	610	545	545	545	545
		IPT(fz)	.0022	.0019	.0019	.0017	.0028	.0025	.0025	.0025	.0025	.0022	.0022	.0031	.0031	.0031	.0031	.0031	.0031	.0028	.0028	.0028	.0028
		RPM	17710	15740	15740	11800	16890	15200	15200	15200	15200	13510	13510	14750	14750	14750	14750	14750	14750	13280	13280	13280	13280
		IPM(FEED)	77	61	61	40	93	75	75	75	75	60	60	92	92	92	92	92	92	74	74	74	74
		Ap	.0011	.0011	.0010	.0008	.0016	.0014	.0014	.0013	.0013	.0013	.0013	.0020	.0020	.0020	.0018	.0018	.0018	.0016	.0016	.0014	.0014
	40	SFM(Vc)	910	810	810	610	1010	910	910	910	910	810	810	1015	1015	1015	1015	1015	1015	910	910	910	910
		IPT(fz)	.0030	.0026	.0026	.0023	.0038	.0034	.0034	.0034	.0034	.0031	.0031	.0044	.0044	.0044	.0044	.0044	.0044	.0039	.0039	.0039	.0039
		RPM	29510	26230	26230	19670	28070	25260	25260	25260	25260	22450	22450	24590	24590	24590	24590	24590	24590	22130	22130	22130	22130
		IPM(FEED)	174	136	136	90	214	173	173	173	173	138	138	215	215	215	215	215	215	174	174	174	174
		Ap	.0014	.0014	.0013	.0010	.0021	.0019	.0019	.0016	.0016	.0016	.0016	.0027	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0019	.0019
	41	SFM(Vc)	760	675	675	505	845	760	760	760	760	675	675	845	845	845	845	845	845	760	760	760	760
		IPT(fz)	.0027	.0024	.0024	.0021	.0034	.0031	.0031	.0031	.0031	.0028	.0028	.0039	.0039	.0039	.0039	.0039	.0039	.0035	.0035	.0035	.0035
		RPM	24590	21860	21860	16390	23430	21090	21090	21090	21090	18750	18750	20490	20490	20490	20490	20490	20490	18440	18440	18440	18440
		IPM(FEED)	132	103	103	68	161	131	131	131	131	103	103	161	161	161	161	161	161	131	131	131	131
		Ap	.0014	.0014	.0013	.0010	.0021	.0019	.0019	.0016	.0016	.0016	.0016	.0027	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0019	.0019

▶NEXT PAGE

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

VDI 3323	Parameter	Diameter (Ø)																					
		4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7	7	7
	LBS	45	50	61.1	10	12	15	20	25	30	40	10	15	20	25	30	35	40	50	60	40	45	60
5	SFM(Vc)	850	850	640	980	980	980	980	980	880	880	880	880	880	880	880	790	790	790	790	835	835	835
	IPT(fz)	.0038	.0038	.0033	.0061	.0061	.0061	.0061	.0061	.0055	.0055	.0069	.0069	.0069	.0069	.0069	.0062	.0062	.0062	.0062	.0064	.0064	.0064
	RPM	20660	20660	15490	19020	19020	19020	19020	19020	17110	17110	14210	14210	14210	14210	14210	12790	12790	12790	12790	11590	11590	11590
	IPM(FEED)	156	156	102	234	234	234	234	234	189	189	195	195	195	195	195	158	158	158	158	148	148	148
	Ap	.0022	.0022	.0020	.0039	.0039	.0039	.0035	.0035	.0031	.0031	.0047	.0047	.0043	.0043	.0043	.0038	.0038	.0033	.0033	.0044	.0044	.0039
8	SFM(Vc)	850	850	640	980	980	980	980	980	880	880	880	880	880	880	880	790	790	790	790	835	835	835
	IPT(fz)	.0038	.0038	.0033	.0061	.0061	.0061	.0061	.0061	.0055	.0055	.0069	.0069	.0069	.0069	.0069	.0062	.0062	.0062	.0062	.0064	.0064	.0064
	RPM	20660	20660	15490	19020	19020	19020	19020	19020	17110	17110	14210	14210	14210	14210	14210	12790	12790	12790	12790	11590	11590	11590
	IPM(FEED)	156	156	102	234	234	234	234	234	189	189	195	195	195	195	195	158	158	158	158	148	148	148
	Ap	.0022	.0022	.0020	.0039	.0039	.0039	.0035	.0035	.0031	.0031	.0047	.0047	.0043	.0043	.0043	.0038	.0038	.0033	.0033	.0044	.0044	.0039
9	SFM(Vc)	850	850	640	980	980	980	980	980	880	880	880	880	880	880	880	790	790	790	790	835	835	835
	IPT(fz)	.0038	.0038	.0033	.0061	.0061	.0061	.0061	.0061	.0055	.0055	.0069	.0069	.0069	.0069	.0069	.0062	.0062	.0062	.0062	.0064	.0064	.0064
	RPM	20660	20660	15490	19020	19020	19020	19020	19020	17110	17110	14210	14210	14210	14210	14210	12790	12790	12790	12790	11590	11590	11590
	IPM(FEED)	156	156	102	234	234	234	234	234	189	189	195	195	195	195	195	158	158	158	158	148	148	148
	Ap	.0022	.0022	.0020	.0039	.0039	.0039	.0035	.0035	.0031	.0031	.0047	.0047	.0043	.0043	.0043	.0038	.0038	.0033	.0033	.0044	.0044	.0039
11.1	SFM(Vc)	850	850	640	980	980	980	980	980	880	880	880	880	880	880	880	790	790	790	790	835	835	835
	IPT(fz)	.0038	.0038	.0033	.0061	.0061	.0061	.0061	.0061	.0055	.0055	.0069	.0069	.0069	.0069	.0069	.0062	.0062	.0062	.0062	.0064	.0064	.0064
	RPM	20660	20660	15490	19020	19020	19020	19020	19020	17110	17110	14210	14210	14210	14210	14210	12790	12790	12790	12790	11590	11590	11590
	IPM(FEED)	156	156	102	234	234	234	234	234	189	189	195	195	195	195	195	158	158	158	158	148	148	148
	Ap	.0022	.0022	.0020	.0039	.0039	.0039	.0035	.0035	.0031	.0031	.0047	.0047	.0043	.0043	.0043	.0038	.0038	.0033	.0033	.0044	.0044	.0039
11.2	SFM(Vc)	810	810	610	945	945	945	945	945	850	850	860	860	860	860	860	775	775	775	775	805	805	805
	IPT(fz)	.0035	.0035	.0031	.0054	.0054	.0054	.0054	.0054	.0049	.0049	.0060	.0060	.0060	.0060	.0060	.0054	.0054	.0054	.0054	.0056	.0056	.0056
	RPM	19670	19670	14750	18360	18360	18360	18360	18360	16520	16520	13930	13930	13930	13930	13930	12540	12540	12540	12540	11170	11170	11170
	IPM(FEED)	138	138	91	199	199	199	199	199	161	161	168	168	168	168	168	136	136	136	136	126	126	126
	Ap	.0019	.0019	.0017	.0033	.0033	.0033	.0030	.0030	.0027	.0027	.0040	.0040	.0036	.0036	.0036	.0032	.0032	.0028	.0028	.0037	.0037	.0033
38.1	SFM(Vc)	810	810	610	945	945	945	945	945	850	850	860	860	860	860	860	775	775	775	775	805	805	805
	IPT(fz)	.0035	.0035	.0031	.0054	.0054	.0054	.0054	.0054	.0049	.0049	.0060	.0060	.0060	.0060	.0060	.0054	.0054	.0054	.0054	.0056	.0056	.0056
	RPM	19670	19670	14750	18360	18360	18360	18360	18360	16520	16520	13930	13930	13930	13930	13930	12540	12540	12540	12540	11170	11170	11170
	IPM(FEED)	138	138	91	199	199	199	199	199	161	161	168	168	168	168	168	136	136	136	136	126	126	126
	Ap	.0019	.0019	.0017	.0033	.0033	.0033	.0030	.0030	.0027	.0027	.0040	.0040	.0036	.0036	.0036	.0032	.0032	.0028	.0028	.0037	.0037	.0033
38.2	SFM(Vc)	675	675	505	795	795	795	795	795	715	715	695	695	695	695	695	625	625	625	625	655	655	655
	IPT(fz)	.0031	.0031	.0028	.0049	.0049	.0049	.0049	.0049	.0044	.0044	.0056	.0056	.0056	.0056	.0056	.0050	.0050	.0050	.0050	.0052	.0052	.0052
	RPM	16390	16390	12300	15410	15410	15410	15410	15410	13870	13870	11200	11200	11200	11200	11200	10080	10080	10080	10080	9050	9050	9050
	IPM(FEED)	103	103	68	152	152	152	152	152	123	123	124	124	124	124	124	101	101	101	101	95	95	95
	Ap	.0019	.0019	.0017	.0033	.0033	.0033	.0030	.0030	.0027	.0027	.0040	.0040	.0036	.0036	.0036	.0032	.0032	.0028	.0028	.0037	.0037	.0033
39.1	SFM(Vc)	595	595	445	710	710	710	710	710	640	640	640	640	640	640	640	580	580	580	580	590	590	590
	IPT(fz)	.0028	.0028	.0025	.0044	.0044	.0044	.0044	.0044	.0040	.0040	.0049	.0049	.0049	.0049	.0049	.0044	.0044	.0044	.0044	.0046	.0046	.0046
	RPM	14430	14430	10820	13770	13770	13770	13770	13770	12390	12390	10380	10380	10380	10380	10380	9340	9340	9340	9340	8200	8200	8200
	IPM(FEED)	82	82	54	123	123	123	123	123	100	100	102	102	102	102	102	83	83	83	83	76	76	76
	Ap	.0018	.0018	.0016	.0031	.0031	.0031	.0028	.0028	.0025	.0025	.0038	.0038	.0034	.0034	.0034	.0030	.0030	.0026	.0026	.0035	.0035	.0031
39.2	SFM(Vc)	540	540	405	610	610	610	610	610	545	545	560	560	560	560	560	500	500	500	500	520	520	520
	IPT(fz)	.0028	.0028	.0024	.0044	.0044	.0044	.0044	.0044	.0039	.0039	.0048	.0048	.0048	.0048	.0048	.0043	.0043	.0043	.0043	.0045	.0045	.0045
	RPM	13110	13110	9840	11800	11800	11800	11800	11800	10620	10620	9020	9020	9020	9020	9020	8120	8120	8120	8120	7190	7190	7190
	IPM(FEED)	72	72	48	103	103	103	103	103	84	84	87	87	87	87	87	70	70	70	70	65	65	65
	Ap	.0018	.0018	.0016	.0031	.0031	.0031	.0028	.0028	.0025	.0025	.0038	.0038	.0034	.0034	.0034	.0030	.0030	.0026	.0026	.0035	.0035	.0031
39.3	SFM(Vc)	485	485	365	560	560	560	560	560	500	500	505	505	505	505	505	455	455	455	455	485	485	485
	IPT(fz)	.0025	.0025	.0022	.0039	.0039	.0039	.0039	.0039	.0035	.0035	.0043	.0043	.0043	.0043	.0043	.0039	.0039	.0039	.0039	.0040	.0040	.0040
	RPM	11800	11800	8850	10820	10820	10820	10820	10820	9740	9740	8200	8200	8200	8200	8200	7380	7380	7380	7380	6730	6730	6730
	IPM(FEED)	59	59	38	85	85	85	85	85	69	69	70	70	70	70	70	57	57	57	57	54	54	54
	Ap	.0014	.0014	.0013	.0026	.0026	.0026	.0023	.0023	.0020	.0020	.0031	.0031	.0028	.0028	.0028	.0025	.0025	.0021	.0021	.0029	.0029	.0025
40	SFM(Vc)	810	810	610	945	945	945	945	945	850	850	860	860	860	860	860	775	775	775	775	805	805	805
	IPT(fz)	.0035	.0035	.0031	.0054	.0054	.0054	.0054	.0054	.0049	.0049	.0060	.0060	.0060	.0060	.0060	.0054	.0054	.0054	.0054	.0056	.0056	.0056
	RPM	19670	19670	14750	18360	18360	18360	18360	18360	16520	16520	13930	13930	13930	13930	13930	12540	12540	12540	12540	11170	11170	11170
	IPM(FEED)	138	138	91	199	199	199	199	199	161	161	168	168	168	168	168	136	136	136	136	126	126	126
	Ap	.0019	.0019	.0017	.0033	.0033	.0033	.0030	.0030	.0027	.0027	.0040	.0040	.0036	.0036	.0036	.0032	.0032	.0028	.0028	.0037	.0037	.0033
41	SFM(Vc)	675	675	505	795	795	795	795	795	715	715	695	695	695	695	695	625	625	625	625	655	655	655
	IPT(fz)	.0031	.0031	.0028	.0049	.0049	.0049	.0049	.0049	.0044	.0044	.0056	.0056	.0056	.0056	.0056	.0050	.0050	.0050	.0050	.0052	.0052	.0052
	RPM	16390	16390	12300	15410	15410	15410	15410	15410	13870	13870	11200	11200	11200	11200	11200	10080	10080	10080	10080	9050	9050	9050
	IPM(FEED)	103	103	68	152	152	152	152	152	123	123	124	124	124	124	124	101	101	101	101	95	95	95
	Ap	.0019	.0019	.0017	.0033	.0033	.0033	.0030	.0030	.0027	.0027	.0040	.0040	.0036	.0036	.0036	.0032	.0032	.0028	.0028	.0037	.0037	.0033

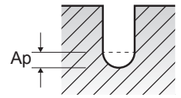
▶NEXT PAGE

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI91, HPI92 SERIES — 2 FLUTE BALL NOSE for RIB PROCESSING



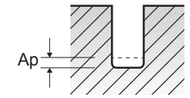
SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																	
			8	8	8	8	8	8	8	8	10	10	10	10	10	10	12	12	12	12
			LBS	35	50	55	60	70	80	98	120	35	55	60	65	75	86	120	60	80	106	120
P	5	SFM(Vc)	945	850	850	850	850	850	755	755	980	880	880	880	880	880	785	880	790	790	790
		IPT(fz)	.0074	.0067	.0067	.0067	.0067	.0067	.0059	.0059	.0078	.0070	.0070	.0070	.0070	.0070	.0063	.0083	.0075	.0075	.0075
		RPM	11480	10330	10330	10330	10330	10330	9180	9180	9510	8560	8560	8560	8560	8560	7610	7100	6390	6390	6390
		IPM(FEED)	171	138	138	138	138	138	109	109	149	121	121	121	121	121	95	119	96	96	96
		Ap	.0057	.0050	.0050	.0050	.0044	.0044	.0044	.0041	.0071	.0063	.0063	.0063	.0063	.0055	.0055	.0085	.0076	.0066	.0066
	8	SFM(Vc)	945	850	850	850	850	850	755	755	980	880	880	880	880	880	785	880	790	790	790
		IPT(fz)	.0074	.0067	.0067	.0067	.0067	.0067	.0059	.0059	.0078	.0070	.0070	.0070	.0070	.0070	.0063	.0083	.0075	.0075	.0075
		RPM	11480	10330	10330	10330	10330	10330	9180	9180	9510	8560	8560	8560	8560	8560	7610	7100	6390	6390	6390
		IPM(FEED)	171	138	138	138	138	138	109	109	149	121	121	121	121	121	95	119	96	96	96
		Ap	.0057	.0050	.0050	.0050	.0044	.0044	.0044	.0041	.0071	.0063	.0063	.0063	.0063	.0055	.0055	.0085	.0076	.0066	.0066
	9	SFM(Vc)	945	850	850	850	850	850	755	755	980	880	880	880	880	880	785	880	790	790	790
		IPT(fz)	.0074	.0067	.0067	.0067	.0067	.0067	.0059	.0059	.0078	.0070	.0070	.0070	.0070	.0070	.0063	.0083	.0075	.0075	.0075
		RPM	11480	10330	10330	10330	10330	10330	9180	9180	9510	8560	8560	8560	8560	8560	7610	7100	6390	6390	6390
		IPM(FEED)	171	138	138	138	138	138	109	109	149	121	121	121	121	121	95	119	96	96	96
		Ap	.0057	.0050	.0050	.0050	.0044	.0044	.0044	.0041	.0071	.0063	.0063	.0063	.0063	.0055	.0055	.0085	.0076	.0066	.0066
	11.1	SFM(Vc)	945	850	850	850	850	850	755	755	980	880	880	880	880	880	785	880	790	790	790
		IPT(fz)	.0074	.0067	.0067	.0067	.0067	.0067	.0059	.0059	.0078	.0070	.0070	.0070	.0070	.0070	.0063	.0083	.0075	.0075	.0075
		RPM	11480	10330	10330	10330	10330	10330	9180	9180	9510	8560	8560	8560	8560	8560	7610	7100	6390	6390	6390
		IPM(FEED)	171	138	138	138	138	138	109	109	149	121	121	121	121	121	95	119	96	96	96
		Ap	.0057	.0050	.0050	.0050	.0044	.0044	.0044	.0041	.0071	.0063	.0063	.0063	.0063	.0055	.0055	.0085	.0076	.0066	.0066
	11.2	SFM(Vc)	910	820	820	820	820	820	730	730	945	850	850	850	850	850	755	845	760	760	760
		IPT(fz)	.0065	.0058	.0058	.0058	.0058	.0058	.0052	.0052	.0069	.0062	.0062	.0062	.0062	.0062	.0055	.0074	.0066	.0066	.0066
		RPM	11070	9960	9960	9960	9960	9960	8850	8850	9180	8260	8260	8260	8260	8260	7340	6830	6150	6150	6150
		IPM(FEED)	143	116	116	116	116	116	91	91	126	102	102	102	102	102	80	101	81	81	81
		Ap	.0048	.0043	.0043	.0043	.0037	.0037	.0037	.0035	.0060	.0054	.0054	.0054	.0054	.0047	.0047	.0072	.0064	.0056	.0056
H	38.1	SFM(Vc)	910	820	820	820	820	820	730	730	945	850	850	850	850	850	755	845	760	760	760
		IPT(fz)	.0065	.0058	.0058	.0058	.0058	.0058	.0052	.0052	.0069	.0062	.0062	.0062	.0062	.0062	.0055	.0074	.0066	.0066	.0066
		RPM	11070	9960	9960	9960	9960	9960	8850	8850	9180	8260	8260	8260	8260	8260	7340	6830	6150	6150	6150
		IPM(FEED)	143	116	116	116	116	116	91	91	126	102	102	102	102	102	80	101	81	81	81
		Ap	.0048	.0043	.0043	.0043	.0037	.0037	.0037	.0035	.0060	.0054	.0054	.0054	.0054	.0047	.0047	.0072	.0064	.0056	.0056
	38.2	SFM(Vc)	760	685	685	685	685	685	610	610	795	715	715	715	715	715	635	710	640	640	640
		IPT(fz)	.0059	.0053	.0053	.0053	.0053	.0053	.0047	.0047	.0063	.0057	.0057	.0057	.0057	.0057	.0050	.0067	.0060	.0060	.0060
		RPM	9220	8300	8300	8300	8300	8300	7380	7380	7700	6930	6930	6930	6930	6930	6160	5740	5160	5160	5160
		IPM(FEED)	109	88	88	88	88	88	70	70	97	79	79	79	79	79	62	77	62	62	62
		Ap	.0048	.0043	.0043	.0043	.0037	.0037	.0037	.0035	.0060	.0054	.0054	.0054	.0054	.0047	.0047	.0072	.0064	.0056	.0056
	39.1	SFM(Vc)	675	610	610	610	610	610	540	540	695	625	625	625	625	625	555	640	580	580	580
		IPT(fz)	.0053	.0048	.0048	.0048	.0048	.0048	.0042	.0042	.0057	.0051	.0051	.0051	.0051	.0051	.0045	.0061	.0055	.0055	.0055
		RPM	8200	7380	7380	7380	7380	7380	6560	6560	6720	6050	6050	6050	6050	6050	5380	5190	4670	4670	4670
		IPM(FEED)	86	70	70	70	70	70	55	55	76	62	62	62	62	62	49	63	51	51	51
		Ap	.0045	.0040	.0040	.0040	.0035	.0035	.0035	.0033	.0057	.0050	.0050	.0050	.0050	.0044	.0044	.0068	.0060	.0053	.0053
	39.2	SFM(Vc)	590	530	530	530	530	530	475	475	610	545	545	545	545	545	485	560	500	500	500
		IPT(fz)	.0052	.0047	.0047	.0047	.0047	.0047	.0042	.0042	.0056	.0050	.0050	.0050	.0050	.0050	.0045	.0056	.0050	.0050	.0050
		RPM	7170	6460	6460	6460	6460	6460	5740	5740	5900	5310	5310	5310	5310	5310	4720	4510	4060	4060	4060
		IPM(FEED)	75	60	60	60	60	60	48	48	66	54	54	54	54	54	42	50	41	41	41
		Ap	.0045	.0040	.0040	.0040	.0035	.0035	.0035	.0033	.0057	.0050	.0050	.0050	.0050	.0044	.0044	.0068	.0060	.0053	.0053
	39.3	SFM(Vc)	560	500	500	500	500	z	445	445	560	500	500	500	500	500	445	505	455	455	455
		IPT(fz)	.0047	.0042	.0042	.0042	.0042	.0042	.0037	.0037	.0051	.0046	.0046	.0046	.0046	.0046	.0041	.0052	.0046	.0046	.0046
		RPM	6760	6090	6090	6090	6090	6090	5410	5410	5410	4870	4870	4870	4870	4870	4330	4100	3690	3690	3690
		IPM(FEED)	63	51	51	51	51	51	40	40	55	45	45	45	45	45	35	42	34	34	34
		Ap	.0037	.0033	.0033	.0033	.0029	.0029	.0029	.0027	.0046	.0041	.0041	.0041	.0041	.0036	.0036	.0055	.0049	.0043	.0043
	40	SFM(Vc)	910	820	820	820	820	820	730	730	945	850	850	850	850	850	755	845	760	760	760
		IPT(fz)	.0065	.0058	.0058	.0058	.0058	.0058	.0052	.0052	.0069	.0062	.0062	.0062	.0062	.0062	.0055	.0074	.0066	.0066	.0066
		RPM	11070	9960	9960	9960	9960	9960	8850	8850	9180	8260	8260	8260	8260	8260	7340	6830	6150	6150	6150
		IPM(FEED)	143	116	116	116	116	116	91	91	126	102	102	102	102	102	80	101	81	81	81
		Ap	.0048	.0043	.0043	.0043	.0037	.0037	.0037	.0035	.0060	.0054	.0054	.0054	.0054	.0047	.0047	.0072	.0064	.0056	.0056
	41	SFM(Vc)	760	685	685	685	685	685	610	610	795	715	715	715	715	715	635	710	640	640	640
		IPT(fz)	.0059	.0053	.0053	.0053	.0053	.0053	.0047	.0047	.0063	.0057	.0057	.0057	.0057	.0057	.0050	.0067	.0060	.0060	.0060
		RPM	9220	8300	8300	8300	8300	8300	7380	7380	7700	6930	6930	6930	6930	6930	6160	5740	5160	5160	5160
		IPM(FEED)	109	88	88	88	88	88	70	70	97	79	79	79	79	79	62	77	62	62	62
		Ap	.0048	.0043	.0043	.0043	.0037	.0037	.0037	.0035	.0060	.0054	.0054	.0054	.0054	.0047	.0047	.0072	.0064	.0056	.0056

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI89 SERIES — 2 FLUTE CORNER RADIUS for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

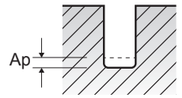
ISO	VDI 3323	Material Description	Slotting	Parameter	Diameter (Ø)															
					0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
			Ae	LBS	0.5	1	1.5	2	1	1.5	2	2.5	3	1	1.5	2	2.5	3	4	1	2	3
P	5	Non-alloy steel	1.0D	SFM(Vc)	100	100	90	90	150	150	135	135	135	220	220	220	200	200	200	270	270	245
				IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
				RPM	49180	49180	44260	44260	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950	52460	52460	47210
				IPM(FEED)	4	4	4	4	8	8	7	7	7	8	8	8	8	8	8	17	17	15
				Ap	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006	.0010	.0009	.0008
	8	Low alloy steel	1.0D	SFM(Vc)	100	100	90	90	150	150	135	135	135	220	220	220	200	200	200	270	270	245
				IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
				RPM	49180	49180	44260	44260	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950	52460	52460	47210
				IPM(FEED)	4	4	4	4	8	8	7	7	7	8	8	8	8	8	8	17	17	15
				Ap	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006	.0010	.0009	.0008
	9		1.0D	SFM(Vc)	100	100	90	90	150	150	135	135	135	220	220	220	200	200	200	270	270	245
				IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
				RPM	49180	49180	44260	44260	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950	52460	52460	47210
				IPM(FEED)	4	4	4	4	8	8	7	7	7	8	8	8	8	8	8	17	17	15
				Ap	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006	.0010	.0009	.0008
	11.1	High alloyed steel, and tool steel	1.0D	SFM(Vc)	100	100	90	90	150	150	135	135	135	220	220	220	200	200	200	270	270	245
				IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
				RPM	49180	49180	44260	44260	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950	52460	52460	47210
				IPM(FEED)	4	4	4	4	8	8	7	7	7	8	8	8	8	8	8	17	17	15
				Ap	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006	.0010	.0009	.0008
	11.2		1.0D	SFM(Vc)	100	100	90	90	135	135	120	120	120	185	185	185	165	165	165	235	235	215
				IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	44260	44260	43710	43710	39340	39340	39340	45080	45080	45080	40570	40570	40570	45900	45900	41310
				IPM(FEED)	4	4	4	4	7	7	6	6	6	7	7	7	6	6	6	11	11	10
				Ap	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0007
H	38.1	Hardened steel	1.0D	SFM(Vc)	100	100	90	90	135	135	120	120	120	185	185	185	165	165	165	235	235	215
				IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	44260	44260	43710	43710	39340	39340	39340	45080	45080	45080	40570	40570	40570	45900	45900	41310
				IPM(FEED)	4	4	4	4	7	7	6	6	6	7	7	7	6	6	6	11	11	10
				Ap	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0007
	38.2		1.0D	SFM(Vc)	85	85	75	75	135	135	120	120	120	170	170	170	150	150	150	220	220	200
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	40980	40980	36890	36890	43710	43710	39340	39340	39340	40980	40980	40980	36890	36890	36890	42620	42620	38360
				IPM(FEED)	3	3	3	3	3	3	3	3	3	6	6	6	6	6	6	10	10	9
				Ap	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0007
	39.1		1.0D	SFM(Vc)	70	70	60	60	100	100	90	90	90	135	135	135	120	120	120	170	170	150
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001
				RPM	32790	32790	29510	29510	32790	32790	29510	29510	29510	32790	32790	32790	29510	29510	29510	32790	32790	29510
				IPM(FEED)	3	3	2	2	3	3	2	2	2	3	3	3	2	2	2	5	5	5
				Ap	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005	.0004	.0008	.0007	.0006
	39.2		1.0D	SFM(Vc)	70	70	60	60	85	85	75	75	75	100	100	100	90	90	90	135	135	120
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001
				RPM	32790	32790	29510	29510	27320	27320	24590	24590	24590	24590	24590	24590	22130	22130	22130	26230	26230	23610
				IPM(FEED)	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	4
				Ap	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005	.0004	.0008	.0007	.0006
	39.3		1.0D	SFM(Vc)	70	70	60	60	70	70	60	60	60	85	85	85	75	75	75	100	100	90
				IPT(fz)	.0004	.0004	.0003	.0003	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.00004
				RPM	32790	32790	29510	29510	21860	21860	19670	19670	19670	20490	20490	20490	18440	18440	18440	19670	19670	17710
				IPM(FEED)	23	23	19	19	2	2	2	2	2	2	2	2	1	1	1	3	3	1
				Ap	.0003	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0006	.0006	.0005
	40	Chilled Cast Iron	1.0D	SFM(Vc)	100	100	90	90	135	135	120	120	120	185	185	185	165	165	165	235	235	215
				IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	44260	44260	43710	43710	39340	39340	39340	45080	45080	45080	40570	40570	40570	45900	45900	41310
				IPM(FEED)	4	4	4	4	7	7	6	6	6	7	7	7	6	6	6	11	11	10
				Ap	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0007
	41	Hardened Cast Iron	1.0D	SFM(Vc)	85	85	75	75	135	135	120	120	120	170	170	170	150	150	150	220	220	200
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	40980	40980	36890	36890	43710	43710	39340	39340	39340	40980	40980	40980	36890	36890	36890	42620	42620	38360
				IPM(FEED)	3	3	3	3	3	3	3	3	3	6	6	6	6	6	6	10	10	9
				Ap	.0003	.0003	.0003	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0007

▶NEXT PAGE

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI89 SERIES — 2 FLUTE CORNER RADIUS for RIB PROCESSING

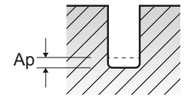


SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																					
			0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1	1	1	1
		LBS	4	5	6	2	4	6	8	10	2	4	6	2	4	6	8	12	4	8	4	6	8	10
P	5	SFM(Vc)	245	245	215	320	290	290	255	195	370	335	335	420	420	380	380	340	475	425	505	455	455	455
		IPT(fz)	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0004	.0004	.0004	.0004
		RPM	47210	47210	41970	51910	46720	46720	41530	31150	51570	46410	46410	51230	51230	46110	46110	40980	51000	45900	49180	44260	44260	44260
		IPM(FEED)	15	15	10	20	18	18	13	10	24	18	18	24	24	18	18	16	28	22	39	31	31	31
		Ap	.0008	.0007	.0007	.0011	.0009	.0008	.0007	.0006	.0014	.0011	.0010	.0016	.0014	.0013	.0011	.0009	.0016	.0012	.0018	.0016	.0016	.0014
	8	SFM(Vc)	245	245	215	320	290	290	255	195	370	335	335	420	420	380	380	340	475	425	505	455	455	455
		IPT(fz)	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0004	.0004	.0004	.0004
		RPM	47210	47210	41970	51910	46720	46720	41530	31150	51570	46410	46410	51230	51230	46110	46110	40980	51000	45900	49180	44260	44260	44260
		IPM(FEED)	15	15	10	20	18	18	13	10	24	18	18	24	24	18	18	16	28	22	39	31	31	31
		Ap	.0008	.0007	.0007	.0011	.0009	.0008	.0007	.0006	.0014	.0011	.0010	.0016	.0014	.0013	.0011	.0009	.0016	.0012	.0018	.0016	.0016	.0014
	9	SFM(Vc)	245	245	215	320	290	290	255	195	370	335	335	420	420	380	380	340	475	425	505	455	455	455
		IPT(fz)	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0004	.0004	.0004	.0004
		RPM	47210	47210	41970	51910	46720	46720	41530	31150	51570	46410	46410	51230	51230	46110	46110	40980	51000	45900	49180	44260	44260	44260
		IPM(FEED)	15	15	10	20	18	18	13	10	24	18	18	24	24	18	18	16	28	22	39	31	31	31
		Ap	.0008	.0007	.0007	.0011	.0009	.0008	.0007	.0006	.0014	.0011	.0010	.0016	.0014	.0013	.0011	.0009	.0016	.0012	.0018	.0016	.0016	.0014
	11.1	SFM(Vc)	245	245	215	320	290	290	255	195	370	335	335	420	420	380	380	340	475	425	505	455	455	455
		IPT(fz)	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0004	.0004	.0004	.0004
		RPM	47210	47210	41970	51910	46720	46720	41530	31150	51570	46410	46410	51230	51230	46110	46110	40980	51000	45900	49180	44260	44260	44260
		IPM(FEED)	15	15	10	20	18	18	13	10	24	18	18	24	24	18	18	16	28	22	39	31	31	31
		Ap	.0008	.0007	.0007	.0011	.0009	.0008	.0007	.0006	.0014	.0011	.0010	.0016	.0014	.0013	.0011	.0009	.0016	.0012	.0018	.0016	.0016	.0014
	11.2	SFM(Vc)	215	215	190	285	260	260	230	170	305	275	275	340	340	305	305	270	370	335	405	365	365	365
		IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0003	.0003	.0003	.0003
		RPM	41310	41310	36720	46450	41800	41800	37160	27870	42230	38010	38010	40980	40980	36890	36890	32790	40070	36070	39340	35410	35410	35410
		IPM(FEED)	10	10	6	15	13	13	9	7	17	15	15	19	19	15	15	13	22	17	25	20	20	20
		Ap	.0007	.0006	.0006	.0009	.0008	.0007	.0006	.0005	.0012	.0009	.0008	.0013	.0012	.0011	.0009	.0008	.0014	.0011	.0015	.0013	.0013	.0012
H	38.1	SFM(Vc)	215	215	190	285	260	260	230	170	305	275	275	340	340	305	305	270	370	335	405	365	365	365
		IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0003	.0003	.0003	.0003
		RPM	41310	41310	36720	46450	41800	41800	37160	27870	42230	38010	38010	40980	40980	36890	36890	32790	40070	36070	39340	35410	35410	35410
		IPM(FEED)	10	10	6	15	13	13	9	7	17	15	15	19	19	15	15	13	22	17	25	20	20	20
		Ap	.0007	.0006	.0006	.0009	.0008	.0007	.0006	.0005	.0012	.0009	.0008	.0013	.0012	.0011	.0009	.0008	.0014	.0011	.0015	.0013	.0013	.0012
	38.2	SFM(Vc)	200	200	175	255	230	230	205	150	255	225	225	255	255	230	230	205	270	245	270	245	245	245
		IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0002	.0002
		RPM	38360	38360	34100	40980	36890	36890	32790	24590	35020	31520	31520	30740	30740	27660	27660	24590	29140	26230	26230	23610	23610	23610
		IPM(FEED)	9	9	5	13	12	12	8	6	14	10	10	12	12	11	11	8	14	10	14	11	11	11
		Ap	.0007	.0006	.0006	.0009	.0008	.0007	.0006	.0005	.0012	.0009	.0008	.0013	.0012	.0011	.0009	.0008	.0014	.0011	.0015	.0013	.0013	.0012
	39.1	SFM(Vc)	150	150	135	185	165	165	150	110	205	185	185	220	220	200	200	175	220	200	220	200	200	200
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	29510	29510	26230	30050	27050	27050	24040	18030	28340	25500	25500	26640	26640	23980	23980	21310	23680	21310	21310	19180	19180	19180
		IPM(FEED)	5	5	4	7	6	6	4	3	9	6	6	8	8	8	8	5	9	8	8	8	8	8
		Ap	.0006	.0006	.0006	.0009	.0008	.0007	.0006	.0005	.0011	.0009	.0008	.0013	.0011	.0010	.0009	.0008	.0013	.0010	.0014	.0013	.0013	.0011
	39.2	SFM(Vc)	120	120	110	150	135	135	120	90	150	135	135	170	170	150	150	135	170	150	170	150	150	150
		IPT(fz)	.0001	.0001	.0000	.0001	.0001	.0001	.0001	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	23610	23610	20980	24590	22130	22130	19670	14750	21120	19000	19000	20490	20490	18440	18440	16390	18220	16390	16390	14750	14750	14750
		IPM(FEED)	4	4	2	4	4	4	3	1	5	3	3	5	5	4	4	3	6	5	5	5	5	5
		Ap	.0006	.0006	.0006	.0009	.0008	.0007	.0006	.0005	.0011	.0009	.0008	.0013	.0011	.0010	.0009	.0008	.0013	.0010	.0014	.0013	.0013	.0011
	39.3	SFM(Vc)	90	90	80	135	120	120	110	80	135	125	125	135	135	120	120	110	135	120	135	120	120	120
		IPT(fz)	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	17710	17710	15740	21860	19670	19670	17490	13120	18950	17060	17060	16390	16390	14750	14750	13110	14570	13110	13110	11800	11800	11800
		IPM(FEED)	1	1	1	3	3	3	3	1	3	3	3	4	4	2	2	2	3	3	3	3	3	3
		Ap	.0005	.0004	.0004	.0007	.0006	.0005	.0005	.0004	.0009	.0007	.0006	.0010	.0009	.0008	.0007	.0006	.0010	.0008	.0012	.0010	.0010	.0009
	40	SFM(Vc)	215	215	190	285	260	260	230	170	305	275	275	340	340	305	305	270	370	335	405	365	365	365
		IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0003	.0003	.0003	.0003
		RPM	41310	41310	36720	46450	41800	41800	37160	27870	42230	38010	38010	40980	40980	36890	36890	32790	40070	36070	39340	35410	35410	35410
		IPM(FEED)	10	10	6	15	13	13	9	7	17	15	15	19	19	15	15	13	22	17	25	20	20	20
		Ap	.0007	.0006	.0006	.0009	.0008	.0007	.0006	.0005	.0012	.0009	.0008	.0013	.0012	.0011	.0009	.0008	.0014	.0011	.0015	.0013	.0013	.0012
	41	SFM(Vc)	200	200	175	255	230	230	205	150	255	225	225	255	255	230	230	205	270	245	270	245	245	245
		IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0002	.0002
		RPM	38360	38360	34100	40980	36890	36890	32790	24590	35020	31520	31520	30740	30740	27660	27660	24590	29140	26230	26230	23610	23610	23610
		IPM(FEED)	9	9	5	13	12	12	8	6	14	10	10	12	12	11	11	8	14	10	14	11	11	11
		Ap	.0007	.0006	.0006	.0009	.0008	.0007	.0006	.0005	.0012	.0009	.0008	.0013	.0012	.0011	.0009	.0008	.0014	.0011	.0015	.0013	.0013	.0012

▶NEXT PAGE

X1-EH END MILLS
RECOMMENDED CUTTING CONDITIONS
HPI89 SERIES — 2 FLUTE CORNER RADIUS for RIB PROCESSING



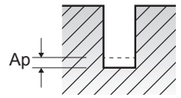
SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

VDI 3323	Parameter	Diameter (Ø)																					
		1	1	1	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2	3	3	3	3	3	3
	LBS	12	16	20	4	8	12	15	20	6	8	12	16	20	25	30	8	12	16	20	30	35
5	SFM(Vc)	405	305	305	645	580	580	580	515	710	710	640	640	640	570	570	695	695	625	625	625	555
	IPT(fz)	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0006
	RPM	39340	29510	29510	41580	37420	37420	37420	33270	34430	34430	30980	30980	30980	27540	27540	22400	22400	20160	20160	20160	17920
	IPM(FEED)	25	16	16	36	29	29	29	24	35	35	29	29	29	22	22	34	34	27	27	27	21
	Ap	.0014	.0012	.0010	.0030	.0024	.0024	.0021	.0018	.0039	.0035	.0031	.0031	.0028	.0028	.0024	.0059	.0053	.0047	.0047	.0041	.0041
8	SFM(Vc)	405	305	305	645	580	580	580	515	710	710	640	640	640	570	570	695	695	625	625	625	555
	IPT(fz)	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0006
	RPM	39340	29510	29510	41580	37420	37420	37420	33270	34430	34430	30980	30980	30980	27540	27540	22400	22400	20160	20160	20160	17920
	IPM(FEED)	25	16	16	36	29	29	29	24	35	35	29	29	29	22	22	34	34	27	27	27	21
	Ap	.0014	.0012	.0010	.0030	.0024	.0024	.0021	.0018	.0039	.0035	.0031	.0031	.0028	.0028	.0024	.0059	.0053	.0047	.0047	.0041	.0041
9	SFM(Vc)	405	305	305	645	580	580	580	515	710	710	640	640	640	570	570	695	695	625	625	625	555
	IPT(fz)	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0006
	RPM	39340	29510	29510	41580	37420	37420	37420	33270	34430	34430	30980	30980	30980	27540	27540	22400	22400	20160	20160	20160	17920
	IPM(FEED)	25	16	16	36	29	29	29	24	35	35	29	29	29	22	22	34	34	27	27	27	21
	Ap	.0014	.0012	.0010	.0030	.0024	.0024	.0021	.0018	.0039	.0035	.0031	.0031	.0028	.0028	.0024	.0059	.0053	.0047	.0047	.0041	.0041
11.1	SFM(Vc)	405	305	305	645	580	580	580	515	710	710	640	640	640	570	570	695	695	625	625	625	555
	IPT(fz)	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0007	.0007	.0006
	RPM	39340	29510	29510	41580	37420	37420	37420	33270	34430	34430	30980	30980	30980	27540	27540	22400	22400	20160	20160	20160	17920
	IPM(FEED)	25	16	16	36	29	29	29	24	35	35	29	29	29	22	22	34	34	27	27	27	21
	Ap	.0014	.0012	.0010	.0030	.0024	.0024	.0021	.0018	.0039	.0035	.0031	.0031	.0028	.0028	.0024	.0059	.0053	.0047	.0047	.0041	.0041
11.2	SFM(Vc)	325	245	245	505	455	455	455	405	560	560	500	500	500	445	445	560	560	500	500	500	445
	IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0008	.0008	.0007	.0007	.0007	.0006
	RPM	31470	23610	23610	32750	29480	29480	29480	26200	27050	27050	24340	24340	24340	21640	21640	18030	18030	16230	16230	16230	14430
	IPM(FEED)	15	11	11	26	21	21	21	16	28	28	23	23	23	17	17	28	28	23	23	23	18
	Ap	.0012	.0010	.0008	.0025	.0020	.0020	.0018	.0015	.0033	.0030	.0027	.0027	.0023	.0023	.0020	.0050	.0045	.0040	.0040	.0035	.0035
38.1	SFM(Vc)	325	245	245	505	455	455	455	405	560	560	500	500	500	445	445	560	560	500	500	500	445
	IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0008	.0008	.0007	.0007	.0007	.0006
	RPM	31470	23610	23610	32750	29480	29480	29480	26200	27050	27050	24340	24340	24340	21640	21640	18030	18030	16230	16230	16230	14430
	IPM(FEED)	15	11	11	26	21	21	21	16	28	28	23	23	23	17	17	28	28	23	23	23	18
	Ap	.0012	.0010	.0008	.0025	.0020	.0020	.0018	.0015	.0033	.0030	.0027	.0027	.0023	.0023	.0020	.0050	.0045	.0040	.0040	.0035	.0035
38.2	SFM(Vc)	215	160	160	340	305	305	305	270	370	370	335	335	335	295	295	370	370	335	335	335	295
	IPT(fz)	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0007	.0007	.0006	.0006	.0006	.0006
	RPM	20980	15740	15740	21940	19750	19750	19750	17550	18030	18030	16230	16230	16230	14430	14430	12020	12020	10820	10820	10820	9620
	IPM(FEED)	10	6	6	16	12	12	12	10	17	17	14	14	14	11	11	17	17	14	14	14	11
	Ap	.0012	.0010	.0008	.0025	.0020	.0020	.0018	.0015	.0033	.0030	.0027	.0027	.0023	.0023	.0020	.0050	.0045	.0040	.0040	.0035	.0035
39.1	SFM(Vc)	175	130	130	270	245	245	245	215	305	305	275	275	275	245	245	305	305	275	275	275	245
	IPT(fz)	.0002	.0002	.0002	.0003	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0006	.0006	.0005	.0005	.0005	.0004
	RPM	17050	12790	12790	17510	15760	15760	15760	14010	14750	14750	13280	13280	13280	11800	11800	9840	9840	8850	8850	8850	7870
	IPM(FEED)	5	4	4	10	7	7	7	6	10	10	8	8	8	6	6	11	11	9	9	9	7
	Ap	.0011	.0009	.0008	.0024	.0019	.0019	.0017	.0014	.0031	.0028	.0025	.0025	.0022	.0022	.0019	.0047	.0043	.0038	.0038	.0033	.0033
39.2	SFM(Vc)	135	100	100	205	185	185	185	165	235	235	215	215	215	190	190	235	235	215	215	215	190
	IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0004
	RPM	13110	9840	9840	13180	11870	11870	11870	10550	11480	11480	10330	10330	10330	9180	9180	7650	7650	6890	6890	6890	6120
	IPM(FEED)	3	2	2	6	5	5	5	3	6	6	5	5	5	4	4	7	7	5	5	5	4
	Ap	.0011	.0009	.0008	.0024	.0019	.0019	.0017	.0014	.0031	.0028	.0025	.0025	.0022	.0022	.0019	.0047	.0043	.0038	.0038	.0033	.0033
39.3	SFM(Vc)	110	80	80	170	155	155	155	135	205	205	180	180	180	160	160	205	205	180	180	180	160
	IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
	RPM	10490	7870	7870	11020	9920	9920	9920	8820	9840	9840	8850	8850	8850	7870	7870	6560	6560	5900	5900	5900	5250
	IPM(FEED)	2	1	1	4	3	3	3	3	5	5	4	4	4	3	3	5	5	4	4	4	3
	Ap	.0009	.0008	.0006	.0019	.0015	.0015	.0013	.0012	.0026	.0023	.0020	.0020	.0018	.0018	.0015	.0038	.0035	.0031	.0031	.0027	.0027
40	SFM(Vc)	325	245	245	505	455	455	455	405	560	560	500	500	500	445	445	560	560	500	500	500	445
	IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0008	.0008	.0007	.0007	.0007	.0006
	RPM	31470	23610	23610	32750	29480	29480	29480	26200	27050	27050	24340	24340	24340	21640	21640	18030	18030	16230	16230	16230	14430
	IPM(FEED)	15	11	11	26	21	21	21	16	28	28	23	23	23	17	17	28	28	23	23	23	18
	Ap	.0012	.0010	.0008	.0025	.0020	.0020	.0018	.0015	.0033	.0030	.0027	.0027	.0023	.0023	.0020	.0050	.0045	.0040	.0040	.0035	.0035
41	SFM(Vc)	215	160	160	340	305	305	305	270	370	370	335	335	335	295	295	370	370	335	335	335	295
	IPT(fz)	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0007	.0007	.0006	.0006	.0006	.0006
	RPM	20980	15740	15740	21940	19750	19750	19750	17550	18030	18030	16230	16230	16230	14430	14430	12020	12020	10820	10820	10820	9620
	IPM(FEED)	10	6	6	16	12	12	12	10	17	17	14	14	14	11	11	17	17	14	14	14	11
	Ap	.0012	.0010	.0008	.0025	.0020	.0020	.0018	.0015	.0033	.0030	.0027	.0027	.0023	.0023	.0020	.0050	.0045	.0040	.0040	.0035	.0035

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

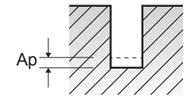
ISO	VDI 3323	Material Description	Slotting	Para-meter	Diameter (Ø)																	
			Ae	LBS	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
					0.5	0.75	1	1.5	2	2.5	3	1	1.5	2	2.5	3	1	1.5	2	2.5	3	3.5
P	5	Non-alloy steel	1.0D	SFM(Vc)	100	100	100	90	90	80	80	150	150	135	135	135	220	220	220	200	200	200
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	49180	44260	44260	39340	39340	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950
				IPM(FEED)	4	4	4	4	4	3	3	8	8	7	7	7	8	8	8	8	8	8
				Ap	.0004	.0004	.0004	.0003	.0003	.0003	.0002	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006
	8	Low alloy steel	1.0D	SFM(Vc)	100	100	100	90	90	80	80	150	150	135	135	135	220	220	220	200	200	200
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	49180	44260	44260	39340	39340	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950
				IPM(FEED)	4	4	4	4	4	3	3	8	8	7	7	7	8	8	8	8	8	8
				Ap	.0004	.0004	.0004	.0003	.0003	.0003	.0002	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006
	9		1.0D	SFM(Vc)	100	100	100	90	90	80	80	150	150	135	135	135	220	220	220	200	200	200
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	49180	44260	44260	39340	39340	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950
				IPM(FEED)	4	4	4	4	4	3	3	8	8	7	7	7	8	8	8	8	8	8
				Ap	.0004	.0004	.0004	.0003	.0003	.0003	.0002	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006
	11.1	High alloyed steel, and tool steel	1.0D	SFM(Vc)	100	100	100	90	90	80	80	150	150	135	135	135	220	220	220	200	200	200
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	49180	44260	44260	39340	39340	49180	49180	44260	44260	44260	53280	53280	53280	47950	47950	47950
				IPM(FEED)	4	4	4	4	4	3	3	8	8	7	7	7	8	8	8	8	8	8
				Ap	.0004	.0004	.0004	.0003	.0003	.0003	.0002	.0005	.0005	.0005	.0004	.0004	.0008	.0007	.0007	.0006	.0006	.0006
	11.2		1.0D	SFM(Vc)	100	100	100	90	90	80	80	135	135	120	120	120	185	185	185	165	165	165
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	49180	44260	44260	39340	39340	43710	43710	39340	39340	39340	45080	45080	45080	40570	40570	40570
				IPM(FEED)	4	4	4	4	4	3	3	7	7	6	6	6	7	7	7	6	6	6
				Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005
H	38.1	Hardened steel	1.0D	SFM(Vc)	100	100	100	90	90	80	80	135	135	120	120	120	185	185	185	165	165	165
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	49180	44260	44260	39340	39340	43710	43710	39340	39340	39340	45080	45080	45080	40570	40570	40570
				IPM(FEED)	4	4	4	4	4	3	3	7	7	6	6	6	7	7	7	6	6	6
				Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005
	38.2		1.0D	SFM(Vc)	85	85	85	75	75	70	70	135	135	120	120	120	170	170	170	150	150	150
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	40980	40980	40980	36890	36890	32790	32790	43710	43710	39340	39340	39340	40980	40980	40980	36890	36890	36890
				IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3	6	6	6	6	6	6
				Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005
	39.1		1.0D	SFM(Vc)	70	70	70	60	60	55	55	100	100	90	90	90	135	135	135	120	120	120
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004
				RPM	32790	32790	32790	29510	29510	26230	26230	32790	32790	29510	29510	29510	32790	32790	32790	29510	29510	29510
				IPM(FEED)	3	3	3	2	2	2	2	3	3	2	2	2	3	3	3	2	2	2
				Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005	.0004
	39.2		1.0D	SFM(Vc)	70	70	70	60	60	55	55	85	85	75	75	75	100	100	100	90	90	90
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004
				RPM	32790	32790	32790	29510	29510	26230	26230	27320	27320	24590	24590	24590	24590	24590	24590	22130	22130	22130
				IPM(FEED)	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
				Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005	.0004
	39.3		1.0D	SFM(Vc)	70	70	70	60	60	55	55	70	70	60	60	60	85	85	85	75	75	75
				IPT(fz)	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004
				RPM	32790	32790	32790	29510	29510	26230	26230	21860	21860	19670	19670	19670	20490	20490	20490	18440	18440	18440
				IPM(FEED)	23	23	23	19	19	14	14	2	2	2	2	2	2	2	2	1	1	1
				Ap	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004
	40	Chilled Cast Iron	1.0D	SFM(Vc)	100	100	100	90	90	80	80	135	135	120	120	120	185	185	185	165	165	165
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	49180	49180	49180	44260	44260	39340	39340	43710	43710	39340	39340	39340	45080	45080	45080	40570	40570	40570
				IPM(FEED)	4	4	4	4	4	3	3	7	7	6	6	6	7	7	7	6	6	6
				Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005
	41	Hardened Cast Iron	1.0D	SFM(Vc)	85	85	85	75	75	70	70	135	135	120	120	120	170	170	170	150	150	150
				IPT(fz)	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001
				RPM	40980	40980	40980	36890	36890	32790	32790	43710	43710	39340	39340	39340	40980	40980	40980	36890	36890	36890
				IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3	6	6	6	6	6	6
				Ap	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0005	.0005	.0004	.0004	.0004	.0007	.0006	.0006	.0005	.0005	.0005

▶NEXT PAGE

X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

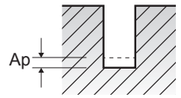
VDI 3323	Para-meter	Diameter (Ø)																				
		0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	
	LBS	4	5	6	8	10	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	1.5	2
5	SFM(Vc)	200	175	175	130	65	270	270	270	270	245	245	245	245	245	215	215	160	160	160	320	320
	IPT(fz)	.0001	.0001	.0001	.00004	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	47950	42620	42620	31970	15980	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	31480	51910	51910
	IPM(FEED)	8	7	7	3	1	17	17	17	17	15	15	15	15	15	10	10	7	7	7	20	20
	Ap	.0006	.0006	.0005	.0004	.0003	.0010	.0010	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0012	.0011
8	SFM(Vc)	200	175	175	130	65	270	270	270	270	245	245	245	245	245	215	215	160	160	160	320	320
	IPT(fz)	.0001	.0001	.0001	.00004	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	47950	42620	42620	31970	15980	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	31480	51910	51910
	IPM(FEED)	8	7	7	3	1	17	17	17	17	15	15	15	15	15	10	10	7	7	7	20	20
	Ap	.0006	.0006	.0005	.0004	.0003	.0010	.0010	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0012	.0011
9	SFM(Vc)	200	175	175	130	65	270	270	270	270	245	245	245	245	245	215	215	160	160	160	320	320
	IPT(fz)	.0001	.0001	.0001	.00004	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	47950	42620	42620	31970	15980	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	31480	51910	51910
	IPM(FEED)	8	7	7	3	1	17	17	17	17	15	15	15	15	15	10	10	7	7	7	20	20
	Ap	.0006	.0006	.0005	.0004	.0003	.0010	.0010	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0012	.0011
11.1	SFM(Vc)	200	175	175	130	65	270	270	270	270	245	245	245	245	245	215	215	160	160	160	320	320
	IPT(fz)	.0001	.0001	.0001	.00004	.0000	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	47950	42620	42620	31970	15980	52460	52460	52460	52460	47210	47210	47210	47210	47210	41970	41970	31480	31480	31480	51910	51910
	IPM(FEED)	8	7	7	3	1	17	17	17	17	15	15	15	15	15	10	10	7	7	7	20	20
	Ap	.0006	.0006	.0005	.0004	.0003	.0010	.0010	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0012	.0011
11.2	SFM(Vc)	165	150	150	110	55	235	235	235	235	215	215	215	215	215	190	190	140	140	140	285	285
	IPT(fz)	.0001	.0001	.0001	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	40570	36070	36070	27050	13520	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46450	46450
	IPM(FEED)	6	6	6	2	1	11	11	11	11	10	10	10	10	10	6	6	4	4	4	15	15
	Ap	.0005	.0005	.0004	.0003	.0003	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0010	.0009
38.1	SFM(Vc)	165	150	150	110	55	235	235	235	235	215	215	215	215	215	190	190	140	140	140	285	285
	IPT(fz)	.0001	.0001	.0001	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	40570	36070	36070	27050	13520	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46450	46450
	IPM(FEED)	6	6	6	2	1	11	11	11	11	10	10	10	10	10	6	6	4	4	4	15	15
	Ap	.0005	.0005	.0004	.0003	.0003	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0010	.0009
38.2	SFM(Vc)	150	135	135	100	50	220	220	220	220	200	200	200	200	200	175	175	130	130	130	255	255
	IPT(fz)	.0001	.0001	.0001	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	36890	32790	32790	24590	12300	42620	42620	42620	42620	38360	38360	38360	38360	38360	34100	34100	25570	25570	25570	40980	40980
	IPM(FEED)	6	5	5	2	1	10	10	10	10	9	9	9	9	9	5	5	4	4	4	13	13
	Ap	.0005	.0005	.0004	.0003	.0003	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0010	.0009
39.1	SFM(Vc)	120	110	110	80	40	170	170	170	170	150	150	150	150	150	135	135	100	100	100	185	185
	IPT(fz)	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.00004	.00004	.00004	.0001	.0001
	RPM	29510	26230	26230	19670	9840	32790	32790	32790	32790	29510	29510	29510	29510	29510	26230	26230	19670	19670	19670	30050	30050
	IPM(FEED)	2	2	2	2	1	5	5	5	5	5	5	5	5	5	4	4	2	2	2	7	7
	Ap	.0004	.0004	.0004	.0003	.0003	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0009	.0009
39.2	SFM(Vc)	90	80	80	60	30	135	135	135	135	120	120	120	120	120	110	110	80	80	80	150	150
	IPT(fz)	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.00004	.00004	.00004	.00004	.00004	.0001	.0001
	RPM	22130	19670	19670	14750	7380	26230	26230	26230	26230	23610	23610	23610	23610	23610	20980	20980	15740	15740	15740	24590	24590
	IPM(FEED)	2	2	2	1	1	4	4	4	4	4	4	4	4	4	2	2	1	1	1	4	4
	Ap	.0004	.0004	.0004	.0003	.0003	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0009	.0009
39.3	SFM(Vc)	75	70	70	50	25	100	100	100	100	90	90	90	90	90	80	80	60	60	60	135	135
	IPT(fz)	.00004	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.00004	.0001	.0001
	RPM	18440	16390	16390	12300	6150	19670	19670	19670	19670	17710	17710	17710	17710	17710	15740	15740	11800	11800	11800	21860	21860
	IPM(FEED)	1	1	1	1	0	3	3	3	3	1	1	1	1	1	1	1	1	1	1	3	3
	Ap	.0004	.0004	.0003	.0003	.0002	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0008	.0007
40	SFM(Vc)	165	150	150	110	55	235	235	235	235	215	215	215	215	215	190	190	140	140	140	285	285
	IPT(fz)	.0001	.0001	.0001	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	40570	36070	36070	27050	13520	45900	45900	45900	45900	41310	41310	41310	41310	41310	36720	36720	27540	27540	27540	46450	46450
	IPM(FEED)	6	6	6	2	1	11	11	11	11	10	10	10	10	10	6	6	4	4	4	15	15
	Ap	.0005	.0005	.0004	.0003	.0003	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0010	.0009
41	SFM(Vc)	150	135	135	100	50	220	220	220	220	200	200	200	200	200	175	175	130	130	130	255	255
	IPT(fz)	.0001	.0001	.0001	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
	RPM	36890	32790	32790	24590	12300	42620	42620	42620	42620	38360	38360	38360	38360	38360	34100	34100	25570	25570	25570	40980	40980
	IPM(FEED)	6	5	5	2	1	10	10	10	10	9	9	9	9	9	5	5	4	4	4	13	13
	Ap	.0005	.0005	.0004	.0003	.0003	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0010	.0009

▶NEXT PAGE

YG X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Para-meter	Diameter (Ø)																			
			0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1	1	1	1
		LBS	3	4	5	6	2	4	6	8	10	3	4	5	6	8	10	12	2	3	4	5
P	5	SFM(Vc)	320	290	290	290	370	335	335	300	300	420	420	380	380	380	340	340	505	505	505	505
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	51910	46720	46720	46720	51570	46410	46410	41260	41260	51230	51230	46110	46110	46110	40980	40980	49180	49180	49180	49180
		IPM(FEED)	20	18	18	18	24	18	18	13	13	24	24	18	18	18	16	16	39	39	39	39
		Ap	.0011	.0009	.0008	.0008	.0014	.0011	.0010	.0010	.0008	.0014	.0014	.0013	.0013	.0011	.0011	.0009	.0020	.0020	.0018	.0018
	8	SFM(Vc)	320	290	290	290	370	335	335	300	300	420	420	380	380	380	340	340	505	505	505	505
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	51910	46720	46720	46720	51570	46410	46410	41260	41260	51230	51230	46110	46110	46110	40980	40980	49180	49180	49180	49180
		IPM(FEED)	20	18	18	18	24	18	18	13	13	24	24	18	18	18	16	16	39	39	39	39
		Ap	.0011	.0009	.0008	.0008	.0014	.0011	.0010	.0010	.0008	.0014	.0014	.0013	.0013	.0011	.0011	.0009	.0020	.0020	.0018	.0018
	9	SFM(Vc)	320	290	290	290	370	335	335	300	300	420	420	380	380	380	340	340	505	505	505	505
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	51910	46720	46720	46720	51570	46410	46410	41260	41260	51230	51230	46110	46110	46110	40980	40980	49180	49180	49180	49180
		IPM(FEED)	20	18	18	18	24	18	18	13	13	24	24	18	18	18	16	16	39	39	39	39
		Ap	.0011	.0009	.0008	.0008	.0014	.0011	.0010	.0010	.0008	.0014	.0014	.0013	.0013	.0011	.0011	.0009	.0020	.0020	.0018	.0018
	11.1	SFM(Vc)	320	290	290	290	370	335	335	300	300	420	420	380	380	380	340	340	505	505	505	505
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	51910	46720	46720	46720	51570	46410	46410	41260	41260	51230	51230	46110	46110	46110	40980	40980	49180	49180	49180	49180
		IPM(FEED)	20	18	18	18	24	18	18	13	13	24	24	18	18	18	16	16	39	39	39	39
		Ap	.0011	.0009	.0008	.0008	.0014	.0011	.0010	.0010	.0008	.0014	.0014	.0013	.0013	.0011	.0011	.0009	.0020	.0020	.0018	.0018
	11.2	SFM(Vc)	285	260	260	260	305	275	275	245	245	340	340	305	305	305	270	270	405	405	405	405
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003
		RPM	46450	41800	41800	41800	42230	38010	38010	33780	33780	40980	40980	36890	36890	36890	32790	32790	39340	39340	39340	39340
		IPM(FEED)	15	13	13	13	17	15	15	11	11	19	19	15	15	15	13	13	25	25	25	25
		Ap	.0009	.0008	.0007	.0007	.0012	.0009	.0008	.0008	.0007	.0012	.0012	.0011	.0011	.0009	.0009	.0008	.0017	.0017	.0015	.0015
	38.1	SFM(Vc)	285	260	260	260	305	275	275	245	245	340	340	305	305	305	270	270	405	405	405	405
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003
		RPM	46450	41800	41800	41800	42230	38010	38010	33780	33780	40980	40980	36890	36890	36890	32790	32790	39340	39340	39340	39340
		IPM(FEED)	15	13	13	13	17	15	15	11	11	19	19	15	15	15	13	13	25	25	25	25
		Ap	.0009	.0008	.0007	.0007	.0012	.0009	.0008	.0008	.0007	.0012	.0012	.0011	.0011	.0009	.0009	.0008	.0017	.0017	.0015	.0015
	38.2	SFM(Vc)	255	230	230	230	255	225	225	200	200	255	255	230	230	230	205	205	270	270	270	270
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003
		RPM	40980	36890	36890	36890	35020	31520	31520	28020	28020	30740	30740	27660	27660	27660	24590	24590	26230	26230	26230	26230
		IPM(FEED)	13	12	12	12	14	10	10	9	9	12	12	11	11	11	8	8	14	14	14	14
		Ap	.0009	.0008	.0007	.0007	.0012	.0009	.0008	.0008	.0007	.0012	.0012	.0011	.0011	.0009	.0009	.0008	.0017	.0017	.0015	.0015
	39.1	SFM(Vc)	185	165	165	165	205	185	185	165	165	220	220	200	200	200	175	175	220	220	220	220
		IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002
		RPM	30050	27050	27050	27050	28340	25500	25500	22670	22670	26640	26640	23980	23980	23980	21310	21310	21310	21310	21310	21310
		IPM(FEED)	7	6	6	6	9	6	6	5	5	8	8	8	8	8	5	5	8	8	8	8
		Ap	.0009	.0008	.0007	.0007	.0011	.0009	.0008	.0008	.0007	.0011	.0011	.0010	.0010	.0009	.0009	.0008	.0016	.0016	.0014	.0014
H	39.2	SFM(Vc)	150	135	135	135	150	135	135	120	120	170	170	150	150	150	135	135	170	170	170	170
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
		RPM	24590	22130	22130	22130	21120	19000	19000	16890	16890	20490	20490	18440	18440	18440	16390	16390	16390	16390	16390	16390
		IPM(FEED)	4	4	4	4	5	3	3	3	3	5	5	4	4	4	3	3	5	5	5	5
		Ap	.0009	.0008	.0007	.0007	.0011	.0009	.0008	.0008	.0007	.0011	.0011	.0010	.0010	.0009	.0009	.0008	.0016	.0016	.0014	.0014
	39.3	SFM(Vc)	135	120	120	120	135	125	125	110	110	135	135	120	120	120	110	110	135	135	135	135
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	21860	19670	19670	19670	18950	17060	17060	15160	15160	16390	16390	14750	14750	14750	13110	13110	13110	13110	13110	13110
		IPM(FEED)	3	3	3	3	3	3	3	2	2	4	4	2	2	2	2	2	3	3	3	3
		Ap	.0007	.0006	.0005	.0005	.0009	.0007	.0006	.0006	.0005	.0009	.0009	.0008	.0008	.0007	.0007	.0006	.0013	.0013	.0012	.0012
	40	SFM(Vc)	285	260	260	260	305	275	275	245	245	340	340	305	305	305	270	270	405	405	405	405
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003
		RPM	46450	41800	41800	41800	42230	38010	38010	33780	33780	40980	40980	36890	36890	36890	32790	32790	39340	39340	39340	39340
		IPM(FEED)	15	13	13	13	17	15	15	11	11	19	19	15	15	15	13	13	25	25	25	25
		Ap	.0009	.0008	.0007	.0007	.0012	.0009	.0008	.0008	.0007	.0012	.0012	.0011	.0011	.0009	.0009	.0008	.0017	.0017	.0015	.0015
	41	SFM(Vc)	255	230	230	230	255	225	225	200	200	255	255	230	230	230	205	205	270	270	270	270
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003
		RPM	40980	36890	36890	36890	35020	31520	31520	28020	28020	30740	30740	27660	27660	27660	24590	24590	26230	26230	26230	26230
		IPM(FEED)	13	12	12	12	14	10	10	9	9	12	12	11	11	11	8	8	14	14	14	14
		Ap	.0009	.0008	.0007	.0007	.0012	.0009	.0008	.0008	.0007	.0012	.0012	.0011	.0011	.0009	.0009	.0008	.0017	.0017	.0015	.0015

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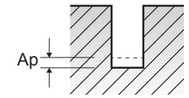
YG X1-EH END MILLS
RECOMMENDED CUTTING CONDITIONS
HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

VDI 3323	Para-meter	Diameter (Ø)																				
		1	1	1	1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.5	1.5	1.5
	LBS	6	7	8	9	10	12	14	16	18	20	22	6	8	10	12	16	6	12	4	6	8
5	SFM(Vc)	455	455	455	455	455	405	405	305	305	305	150	560	500	500	500	445	610	545	645	645	580
	IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0004	.0004	.0004	.0004	.0004
	RPM	44260	44260	44260	44260	44260	39340	39340	29510	29510	29510	14750	45080	40570	40570	40570	36070	42150	37940	41580	41580	37420
	IPM(FEED)	31	31	31	31	31	25	25	16	16	16	7	39	29	29	29	23	36	30	36	36	29
	Ap	.0016	.0016	.0016	.0014	.0014	.0014	.0012	.0012	.0010	.0010	.0008	.0021	.0019	.0017	.0017	.0014	.0025	.0019	.0030	.0027	.0024
8	SFM(Vc)	455	455	455	455	455	405	405	305	305	305	150	560	500	500	500	445	610	545	645	645	580
	IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0004	.0004	.0004	.0004	.0004
	RPM	44260	44260	44260	44260	44260	39340	39340	29510	29510	29510	14750	45080	40570	40570	40570	36070	42150	37940	41580	41580	37420
	IPM(FEED)	31	31	31	31	31	25	25	16	16	16	7	39	29	29	29	23	36	30	36	36	29
	Ap	.0016	.0016	.0016	.0014	.0014	.0014	.0012	.0012	.0010	.0010	.0008	.0021	.0019	.0017	.0017	.0014	.0025	.0019	.0030	.0027	.0024
9	SFM(Vc)	455	455	455	455	455	405	405	305	305	305	150	560	500	500	500	445	610	545	645	645	580
	IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0004	.0004	.0004	.0004	.0004
	RPM	44260	44260	44260	44260	44260	39340	39340	29510	29510	29510	14750	45080	40570	40570	40570	36070	42150	37940	41580	41580	37420
	IPM(FEED)	31	31	31	31	31	25	25	16	16	16	7	39	29	29	29	23	36	30	36	36	29
	Ap	.0016	.0016	.0016	.0014	.0014	.0014	.0012	.0012	.0010	.0010	.0008	.0021	.0019	.0017	.0017	.0014	.0025	.0019	.0030	.0027	.0024
11.1	SFM(Vc)	455	455	455	455	455	405	405	305	305	305	150	560	500	500	500	445	610	545	645	645	580
	IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0004	.0004	.0004	.0004	.0004
	RPM	44260	44260	44260	44260	44260	39340	39340	29510	29510	29510	14750	45080	40570	40570	40570	36070	42150	37940	41580	41580	37420
	IPM(FEED)	31	31	31	31	31	25	25	16	16	16	7	39	29	29	29	23	36	30	36	36	29
	Ap	.0016	.0016	.0016	.0014	.0014	.0014	.0012	.0012	.0010	.0010	.0008	.0021	.0019	.0017	.0017	.0014	.0025	.0019	.0030	.0027	.0024
11.2	SFM(Vc)	365	365	365	365	365	325	325	245	245	245	120	455	410	410	410	365	475	425	505	505	455
	IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004
	RPM	35410	35410	35410	35410	35410	31470	31470	23610	23610	23610	11800	36880	33200	33200	33200	29510	32790	29510	32750	32750	29480
	IPM(FEED)	20	20	20	20	20	15	15	11	11	11	5	26	21	21	21	17	26	21	26	26	21
	Ap	.0013	.0013	.0013	.0012	.0012	.0012	.0010	.0010	.0008	.0008	.0007	.0018	.0016	.0014	.0014	.0012	.0021	.0016	.0025	.0023	.0020
38.1	SFM(Vc)	365	365	365	365	365	325	325	245	245	245	120	455	410	410	410	365	475	425	505	505	455
	IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004
	RPM	35410	35410	35410	35410	35410	31470	31470	23610	23610	23610	11800	36880	33200	33200	33200	29510	32790	29510	32750	32750	29480
	IPM(FEED)	20	20	20	20	20	15	15	11	11	11	5	26	21	21	21	17	26	21	26	26	21
	Ap	.0013	.0013	.0013	.0012	.0012	.0012	.0010	.0010	.0008	.0008	.0007	.0018	.0016	.0014	.0014	.0012	.0021	.0016	.0025	.0023	.0020
38.2	SFM(Vc)	245	245	245	245	245	215	215	160	160	160	80	305	275	275	275	245	320	290	340	340	305
	IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0004	.0003	.0004	.0004	.0003
	RPM	23610	23610	23610	23610	23610	20980	20980	15740	15740	15740	7870	24590	22130	22130	22130	19670	22250	20020	21940	21940	19750
	IPM(FEED)	11	11	11	11	11	10	10	6	6	6	2	15	12	12	12	9	16	13	16	16	12
	Ap	.0013	.0013	.0013	.0012	.0012	.0012	.0010	.0010	.0008	.0008	.0007	.0018	.0016	.0014	.0014	.0012	.0021	.0016	.0025	.0023	.0020
39.1	SFM(Vc)	200	200	200	200	200	175	175	130	130	130	65	245	220	220	220	195	255	230	270	270	245
	IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0002	.0003	.0003	.0002
	RPM	19180	19180	19180	19180	19180	17050	17050	12790	12790	12790	6390	19950	17950	17950	17950	15960	17560	15810	17510	17510	15760
	IPM(FEED)	8	8	8	8	8	5	5	4	4	4	1	9	7	7	7	6	10	7	10	10	7
	Ap	.0013	.0013	.0013	.0011	.0011	.0011	.0009	.0009	.0008	.0008	.0006	.0017	.0015	.0013	.0013	.0011	.0020	.0015	.0024	.0021	.0019
39.2	SFM(Vc)	150	150	150	150	150	135	135	100	100	100	50	185	165	165	165	150	195	175	205	205	185
	IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
	RPM	14750	14750	14750	14750	14750	13110	13110	9840	9840	9840	4920	15030	13520	13520	13520	12020	13580	12230	13180	13180	11870
	IPM(FEED)	5	5	5	5	5	3	3	2	2	2	1	6	5	5	5	4	5	5	6	6	5
	Ap	.0013	.0013	.0013	.0011	.0011	.0011	.0009	.0009	.0008	.0008	.0006	.0017	.0015	.0013	.0013	.0011	.0020	.0015	.0024	.0021	.0019
39.3	SFM(Vc)	120	120	120	120	120	110	110	80	80	80	40	150	135	135	135	120	160	145	170	170	155
	IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002
	RPM	11800	11800	11800	11800	11800	10490	10490	7870	7870	7870	3930	12300	11070	11070	11070	9840	11240	10120	11020	11020	9920
	IPM(FEED)	3	3	3	3	3	2	2	1	1	1	1	4	4	4	4	2	4	3	4	4	3
	Ap	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0006	.0006	.0005	.0014	.0012	.0011	.0011	.0009	.0016	.0013	.0019	.0017	.0015
40	SFM(Vc)	365	365	365	365	365	325	325	245	245	245	120	455	410	410	410	365	475	425	505	505	455
	IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004
	RPM	35410	35410	35410	35410	35410	31470	31470	23610	23610	23610	11800	36880	33200	33200	33200	29510	32790	29510	32750	32750	29480
	IPM(FEED)	20	20	20	20	20	15	15	11	11	11	5	26	21	21	21	17	26	21	26	26	21
	Ap	.0013	.0013	.0013	.0012	.0012	.0012	.0010	.0010	.0008	.0008	.0007	.0018	.0016	.0014	.0014	.0012	.0021	.0016	.0025	.0023	.0020
41	SFM(Vc)	245	245	245	245	245	215	215	160	160	160	80	305	275	275	275	245	320	290	340	340	305
	IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0004	.0003	.0004	.0004	.0003
	RPM	23610	23610	23610	23610	23610	20980	20980	15740	15740	15740	7870	24590	22130	22130	22130	19670	22250	20020	21940	21940	19750
	IPM(FEED)	11	11	11	11	11	10	10	6	6	6	2	15	12	12	12	9	16	13	16	16	12
	Ap	.0013	.0013	.0013	.0012	.0012	.0012	.0010	.0010	.0008	.0008	.0007	.0018	.0016	.0014	.0014	.0012	.0021	.0016	.0025	.0023	.0020

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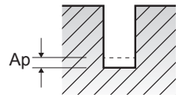
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Para-meter	Diameter (Ø)																			
			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.8	2	2
			LBS	10	12	14	16	18	20	25	30	35	6	8	6	8	10	12	14	16	18	4	6
P	5	SFM(Vc)	580	580	580	515	515	515	385	385	195	660	660	740	740	665	665	665	665	665	710	710
		IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	37420	37420	37420	33270	33270	33270	24950	24950	12470	39960	39960	39960	39960	35960	35960	35960	35960	35960	34430	34430
		IPM(FEED)	29	29	29	24	24	24	16	16	7	38	38	38	38	28	28	28	28	28	35	35
		Ap	.0024	.0024	.0021	.0021	.0021	.0018	.0015	.0015	.0012	.0028	.0028	.0032	.0032	.0028	.0028	.0028	.0025	.0025	.0039	.0039
	8	SFM(Vc)	580	580	580	515	515	515	385	385	195	660	660	740	740	665	665	665	665	665	710	710
		IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	37420	37420	37420	33270	33270	33270	24950	24950	12470	39960	39960	39960	39960	35960	35960	35960	35960	35960	34430	34430
		IPM(FEED)	29	29	29	24	24	24	16	16	7	38	38	38	38	28	28	28	28	28	35	35
		Ap	.0024	.0024	.0021	.0021	.0021	.0018	.0015	.0015	.0012	.0028	.0028	.0032	.0032	.0028	.0028	.0028	.0025	.0025	.0039	.0039
	9	SFM(Vc)	580	580	580	515	515	515	385	385	195	660	660	740	740	665	665	665	665	665	710	710
		IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	37420	37420	37420	33270	33270	33270	24950	24950	12470	39960	39960	39960	39960	35960	35960	35960	35960	35960	34430	34430
		IPM(FEED)	29	29	29	24	24	24	16	16	7	38	38	38	38	28	28	28	28	28	35	35
		Ap	.0024	.0024	.0021	.0021	.0021	.0018	.0015	.0015	.0012	.0028	.0028	.0032	.0032	.0028	.0028	.0028	.0025	.0025	.0039	.0039
	11.1	SFM(Vc)	580	580	580	515	515	515	385	385	195	660	660	740	740	665	665	665	665	665	710	710
		IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	37420	37420	37420	33270	33270	33270	24950	24950	12470	39960	39960	39960	39960	35960	35960	35960	35960	35960	34430	34430
		IPM(FEED)	29	29	29	24	24	24	16	16	7	38	38	38	38	28	28	28	28	28	35	35
		Ap	.0024	.0024	.0021	.0021	.0021	.0018	.0015	.0015	.0012	.0028	.0028	.0032	.0032	.0028	.0028	.0028	.0025	.0025	.0039	.0039
	11.2	SFM(Vc)	455	455	455	405	405	405	305	305	150	525	525	595	595	535	535	535	535	535	560	560
		IPT(fz)	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	29480	29480	29480	26200	26200	26200	19650	19650	9830	31970	31970	31970	31970	28770	28770	28770	28770	28770	27050	27050
		IPM(FEED)	21	21	21	16	16	16	11	11	5	25	25	25	25	20	20	20	20	20	28	28
		Ap	.0020	.0020	.0018	.0018	.0018	.0015	.0013	.0013	.0010	.0024	.0024	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0033	.0033
H	38.1	SFM(Vc)	455	455	455	405	405	405	305	305	150	525	525	595	595	535	535	535	535	535	560	560
		IPT(fz)	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	29480	29480	29480	26200	26200	26200	19650	19650	9830	31970	31970	31970	31970	28770	28770	28770	28770	28770	27050	27050
		IPM(FEED)	21	21	21	16	16	16	11	11	5	25	25	25	25	20	20	20	20	20	28	28
		Ap	.0020	.0020	.0018	.0018	.0018	.0015	.0013	.0013	.0010	.0024	.0024	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0033	.0033
	38.2	SFM(Vc)	305	305	305	270	270	270	205	205	100	350	350	390	390	350	350	350	350	350	370	370
		IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	19750	19750	19750	17550	17550	17550	13160	13160	6580	21110	21110	21110	21110	19000	19000	19000	19000	19000	18030	18030
		IPM(FEED)	12	12	12	10	10	10	6	6	3	17	17	17	17	13	13	13	13	13	17	17
		Ap	.0020	.0020	.0018	.0018	.0018	.0015	.0013	.0013	.0010	.0024	.0024	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0033	.0033
	39.1	SFM(Vc)	245	245	245	215	215	215	160	160	80	280	280	315	315	285	285	285	285	285	305	305
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0004	.0004
		RPM	15760	15760	15760	14010	14010	14010	10510	10510	5250	17010	17010	17010	17010	15310	15310	15310	15310	15310	14750	14750
		IPM(FEED)	7	7	7	6	6	6	4	4	2	9	9	9	9	7	7	7	7	7	10	10
		Ap	.0019	.0019	.0017	.0017	.0017	.0014	.0012	.0012	.0009	.0023	.0023	.0026	.0026	.0023	.0023	.0023	.0020	.0020	.0031	.0031
	39.2	SFM(Vc)	185	185	185	165	165	165	120	120	60	215	215	240	240	215	215	215	215	215	235	235
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003
		RPM	11870	11870	11870	10550	10550	10550	7910	7910	3960	12910	12910	12910	12910	11620	11620	11620	11620	11620	11480	11480
		IPM(FEED)	5	5	5	3	3	3	2	2	1	6	6	6	6	5	5	5	5	5	6	6
		Ap	.0019	.0019	.0017	.0017	.0017	.0014	.0012	.0012	.0009	.0023	.0023	.0026	.0026	.0023	.0023	.0023	.0020	.0020	.0031	.0031
	39.3	SFM(Vc)	155	155	155	135	135	135	100	100	50	180	180	200	200	180	180	180	180	180	205	205
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	9920	9920	9920	8820	8820	8820	6610	6610	3310	10860	10860	10860	10860	9770	9770	9770	9770	9770	9840	9840
		IPM(FEED)	3	3	3	3	3	3	2	2	1	4	4	4	4	3	3	3	3	3	5	5
		Ap	.0015	.0015	.0013	.0013	.0013	.0012	.0010	.0010	.0008	.0018	.0018	.0021	.0021	.0018	.0018	.0018	.0016	.0016	.0026	.0026
	40	SFM(Vc)	455	455	455	405	405	405	305	305	150	525	525	595	595	535	535	535	535	535	560	560
		IPT(fz)	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	29480	29480	29480	26200	26200	26200	19650	19650	9830	31970	31970	31970	31970	28770	28770	28770	28770	28770	27050	27050
		IPM(FEED)	21	21	21	16	16	16	11	11	5	25	25	25	25	20	20	20	20	20	28	28
		Ap	.0020	.0020	.0018	.0018	.0018	.0015	.0013	.0013	.0010	.0024	.0024	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0033	.0033
	41	SFM(Vc)	305	305	305	270	270	270	205	205	100	350	350	390	390	350	350	350	350	350	370	370
		IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0005	.0005
		RPM	19750	19750	19750	17550	17550	17550	13160	13160	6580	21110	21110	21110	21110	19000	19000	19000	19000	19000	18030	18030
		IPM(FEED)	12	12	12	10	10	10	6	6	3	17	17	17	17	13	13	13	13	13	17	17
		Ap	.0020	.0020	.0018	.0018	.0018	.0015	.0013	.0013	.0010	.0024	.0024	.0027	.0027	.0024	.0024	.0024	.0021	.0021	.0033	.0033

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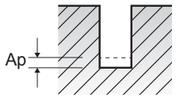
YG X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES — 2 FLUTE SQUARE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

VDI 3323	Para-meter	Diameter (Ø)																			
		2	2	2	2	2	2	2	2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	3	3
	LBS	8	10	12	14	16	18	20	25	30	35	40	50	8	12	16	20	30	40	50	8	12
5	SFM(Vc)	710	710	640	640	640	640	640	570	570	425	425	215	710	710	640	640	570	425	425	695	695
	IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0005	.0004	.0004	.0007	.0007
	RPM	34430	34430	30980	30980	30980	30980	30980	27540	27540	20660	20660	10330	27600	27600	24840	24840	22080	16560	16560	22400	22400
	IPM(FEED)	35	35	29	29	29	29	29	22	22	15	15	6	35	35	27	27	23	14	14	34	34
	Ap	.0035	.0035	.0031	.0031	.0031	.0028	.0028	.0028	.0024	.0020	.0020	.0016	.0044	.0044	.0039	.0039	.0034	.0030	.0025	.0059	.0053
8	SFM(Vc)	710	710	640	640	640	640	640	570	570	425	425	215	710	710	640	640	570	425	425	695	695
	IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0005	.0004	.0004	.0007	.0007
	RPM	34430	34430	30980	30980	30980	30980	30980	27540	27540	20660	20660	10330	27600	27600	24840	24840	22080	16560	16560	22400	22400
	IPM(FEED)	35	35	29	29	29	29	29	22	22	15	15	6	35	35	27	27	23	14	14	34	34
	Ap	.0035	.0035	.0031	.0031	.0031	.0028	.0028	.0028	.0024	.0020	.0020	.0016	.0044	.0044	.0039	.0039	.0034	.0030	.0025	.0059	.0053
9	SFM(Vc)	710	710	640	640	640	640	640	570	570	425	425	215	710	710	640	640	570	425	425	695	695
	IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0005	.0004	.0004	.0007	.0007
	RPM	34430	34430	30980	30980	30980	30980	30980	27540	27540	20660	20660	10330	27600	27600	24840	24840	22080	16560	16560	22400	22400
	IPM(FEED)	35	35	29	29	29	29	29	22	22	15	15	6	35	35	27	27	23	14	14	34	34
	Ap	.0035	.0035	.0031	.0031	.0031	.0028	.0028	.0028	.0024	.0020	.0020	.0016	.0044	.0044	.0039	.0039	.0034	.0030	.0025	.0059	.0053
11.1	SFM(Vc)	710	710	640	640	640	640	640	570	570	425	425	215	710	710	640	640	570	425	425	695	695
	IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0005	.0004	.0004	.0007	.0007
	RPM	34430	34430	30980	30980	30980	30980	30980	27540	27540	20660	20660	10330	27600	27600	24840	24840	22080	16560	16560	22400	22400
	IPM(FEED)	35	35	29	29	29	29	29	22	22	15	15	6	35	35	27	27	23	14	14	34	34
	Ap	.0035	.0035	.0031	.0031	.0031	.0028	.0028	.0028	.0024	.0020	.0020	.0016	.0044	.0044	.0039	.0039	.0034	.0030	.0025	.0059	.0053
11.2	SFM(Vc)	560	560	500	500	500	500	500	445	445	335	335	165	555	555	500	500	445	335	335	560	560
	IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008
	RPM	27050	27050	24340	24340	24340	24340	24340	21640	21640	16230	16230	8120	21630	21630	19470	19470	17300	12980	12980	18030	18030
	IPM(FEED)	28	28	23	23	23	23	23	17	17	11	11	5	29	29	23	23	18	12	12	28	28
	Ap	.0030	.0030	.0027	.0027	.0027	.0023	.0023	.0023	.0023	.0020	.0017	.0017	.0013	.0038	.0038	.0033	.0033	.0029	.0025	.0050	.0045
38.1	SFM(Vc)	560	560	500	500	500	500	500	445	445	335	335	165	555	555	500	500	445	335	335	560	560
	IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008
	RPM	27050	27050	24340	24340	24340	24340	24340	21640	21640	16230	16230	8120	21630	21630	19470	19470	17300	12980	12980	18030	18030
	IPM(FEED)	28	28	23	23	23	23	23	17	17	11	11	5	29	29	23	23	18	12	12	28	28
	Ap	.0030	.0030	.0027	.0027	.0027	.0023	.0023	.0023	.0023	.0020	.0017	.0017	.0013	.0038	.0038	.0033	.0033	.0029	.0025	.0050	.0045
38.2	SFM(Vc)	370	370	335	335	335	335	335	295	295	225	225	110	370	370	335	335	295	225	225	370	370
	IPT(fz)	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0004	.0004	.0007	.0007
	RPM	18030	18030	16230	16230	16230	16230	16230	14430	14430	10820	10820	5410	14420	14420	12980	12980	11540	8650	8650	12020	12020
	IPM(FEED)	17	17	14	14	14	14	14	11	11	7	7	3	17	17	14	14	11	7	7	17	17
	Ap	.0030	.0030	.0027	.0027	.0027	.0023	.0023	.0023	.0020	.0017	.0017	.0013	.0038	.0038	.0033	.0033	.0029	.0025	.0021	.0050	.0045
39.1	SFM(Vc)	305	305	275	275	275	275	275	245	245	180	180	90	305	305	275	275	245	185	185	305	305
	IPT(fz)	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006
	RPM	14750	14750	13280	13280	13280	13280	13280	11800	11800	8850	8850	4430	11850	11850	10660	10660	9480	7110	7110	9840	9840
	IPM(FEED)	10	10	8	8	8	8	8	6	6	4	4	2	10	10	8	8	7	4	4	11	11
	Ap	.0028	.0028	.0025	.0025	.0025	.0022	.0022	.0022	.0019	.0016	.0016	.0013	.0035	.0035	.0031	.0031	.0028	.0024	.0020	.0047	.0043
39.2	SFM(Vc)	235	235	215	215	215	215	215	190	190	140	140	70	235	235	215	215	190	140	140	235	235
	IPT(fz)	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0002	.0002	.0004	.0004
	RPM	11480	11480	10330	10330	10330	10330	10330	9180	9180	6890	6890	3440	9170	9170	8250	8250	7330	5500	5500	7650	7650
	IPM(FEED)	6	6	5	5	5	5	5	4	4	3	3	1	6	6	5	5	4	3	3	7	7
	Ap	.0028	.0028	.0025	.0025	.0025	.0022	.0022	.0022	.0019	.0016	.0016	.0013	.0035	.0035	.0031	.0031	.0028	.0024	.0020	.0047	.0043
39.3	SFM(Vc)	205	205	180	180	180	180	180	160	160	120	120	60	205	205	185	185	165	125	125	205	205
	IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004
	RPM	9840	9840	8850	8850	8850	8850	8850	7870	7870	5900	5900	2950	7930	7930	7140	7140	6350	4760	4760	6560	6560
	IPM(FEED)	5	5	4	4	4	4	4	3	3	2	2	1	5	5	4	4	3	2	2	5	5
	Ap	.0023	.0023	.0020	.0020	.0020	.0018	.0018	.0018	.0015	.0013	.0013	.0010	.0029	.0029	.0026	.0026	.0022	.0019	.0016	.0038	.0035
40	SFM(Vc)	560	560	500	500	500	500	500	445	445	335	335	165	555	555	500	500	445	335	335	560	560
	IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0008	.0008
	RPM	27050	27050	24340	24340	24340	24340	24340	21640	21640	16230	16230	8120	21630	21630	19470	19470	17300	12980	12980	18030	18030
	IPM(FEED)	28	28	23	23	23	23	23	17	17	11	11	5	29	29	23	23	18	12	12	28	28
	Ap	.0030	.0030	.0027	.0027	.0027	.0023	.0023	.0023	.0023	.0020	.0017	.0017	.0013	.0038	.0038	.0033	.0033	.0029	.0025	.0050	.0045
41	SFM(Vc)	370	370	335	335	335	335	335	295	295	225	225	110	370	370	335	335	295	225	225	370	370
	IPT(fz)	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0004	.0004	.0007	.0007
	RPM	18030	18030	16230	16230	16230	16230	16230	14430	14430	10820	10820	5410	14420	14420	12980	12980	11540	8650	8650	12020	12020
	IPM(FEED)	17	17	14	14	14	14	14	11	11	7	7	3	17	17	14	14	11	7	7	17	17
	Ap	.0030	.0030	.0027	.0027	.0027	.0023	.0023	.0023	.0020	.0017	.0017	.0013	.0038	.0038	.0033	.0033	.0029	.0025	.0021	.0050	.0045

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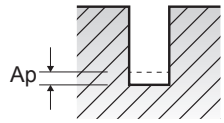
X1-EH END MILLS

RECOMMENDED CUTTING CONDITIONS

HPI88 SERIES 2 FLUTE SQUARE for RIB PROCESSING



SFM(Vc) = ft./min. RPM = rev./min.
IPT(fz) = in./tooth IPM(Feed) = in./min.

ISO	VDI 3323	Para-meter	Diameter (Ø)																	
			3	3	3	3	4	4	4	4	4	4	5	5	5	5	6	6	6	6
		LBS	16	20	25	30	12	16	20	30	40	50	20	30	40	50	20	30	40	50
P	5	SFM(Vc)	625	625	625	625	710	710	710	640	640	570	830	745	745	745	830	830	745	745
		IPT(fz)	.0007	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0009	.0008	.0013	.0011	.0011	.0011	.0014	.0014	.0013	.0013
		RPM	20160	20160	20160	20160	17210	17210	17210	15490	15490	13770	16070	14460	14460	14460	13390	13390	12050	12050
		IPM(FEED)	27	27	27	27	35	35	35	28	28	23	40	33	33	33	38	38	30	30
		Ap	.0047	.0047	.0041	.0041	.0079	.0071	.0071	.0063	.0055	.0055	.0089	.0079	.0079	.0069	.0106	.0106	.0094	.0083
	8	SFM(Vc)	625	625	625	625	710	710	710	640	640	570	830	745	745	745	830	830	745	745
		IPT(fz)	.0007	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0009	.0008	.0013	.0011	.0011	.0011	.0014	.0014	.0013	.0013
		RPM	20160	20160	20160	20160	17210	17210	17210	15490	15490	13770	16070	14460	14460	14460	13390	13390	12050	12050
		IPM(FEED)	27	27	27	27	35	35	35	28	28	23	40	33	33	33	38	38	30	30
		Ap	.0047	.0047	.0041	.0041	.0079	.0071	.0071	.0063	.0055	.0055	.0089	.0079	.0079	.0069	.0106	.0106	.0094	.0083
	9	SFM(Vc)	625	625	625	625	710	710	710	640	640	570	830	745	745	745	830	830	745	745
		IPT(fz)	.0007	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0009	.0008	.0013	.0011	.0011	.0011	.0014	.0014	.0013	.0013
		RPM	20160	20160	20160	20160	17210	17210	17210	15490	15490	13770	16070	14460	14460	14460	13390	13390	12050	12050
		IPM(FEED)	27	27	27	27	35	35	35	28	28	23	40	33	33	33	38	38	30	30
		Ap	.0047	.0047	.0041	.0041	.0079	.0071	.0071	.0063	.0055	.0055	.0089	.0079	.0079	.0069	.0106	.0106	.0094	.0083
	11.1	SFM(Vc)	625	625	625	625	710	710	710	640	640	570	830	745	745	745	830	830	745	745
		IPT(fz)	.0007	.0007	.0007	.0007	.0010	.0010	.0010	.0009	.0009	.0008	.0013	.0011	.0011	.0011	.0014	.0014	.0013	.0013
		RPM	20160	20160	20160	20160	17210	17210	17210	15490	15490	13770	16070	14460	14460	14460	13390	13390	12050	12050
		IPM(FEED)	27	27	27	27	35	35	35	28	28	23	40	33	33	33	38	38	30	30
		Ap	.0047	.0047	.0041	.0041	.0079	.0071	.0071	.0063	.0055	.0055	.0089	.0079	.0079	.0069	.0106	.0106	.0094	.0083
	11.2	SFM(Vc)	500	500	500	500	560	560	560	500	500	445	660	595	595	595	660	660	595	595
		IPT(fz)	.0007	.0007	.0007	.0007	.0011	.0011	.0011	.0009	.0009	.0009	.0013	.0011	.0011	.0011	.0015	.0015	.0013	.0013
		RPM	16230	16230	16230	16230	13520	13520	13520	12170	12170	10820	12790	11510	11510	11510	10660	10660	9590	9590
		IPM(FEED)	23	23	23	23	29	29	29	23	23	19	32	26	26	26	31	31	25	25
		Ap	.0040	.0040	.0035	.0035	.0067	.0060	.0060	.0054	.0047	.0047	.0075	.0067	.0067	.0059	.0090	.0090	.0080	.0070
H	38.1	SFM(Vc)	500	500	500	500	560	560	560	500	500	445	660	595	595	595	660	660	595	595
		IPT(fz)	.0007	.0007	.0007	.0007	.0011	.0011	.0011	.0009	.0009	.0009	.0013	.0011	.0011	.0011	.0015	.0015	.0013	.0013
		RPM	16230	16230	16230	16230	13520	13520	13520	12170	12170	10820	12790	11510	11510	11510	10660	10660	9590	9590
		IPM(FEED)	23	23	23	23	29	29	29	23	23	19	32	26	26	26	31	31	25	25
		Ap	.0040	.0040	.0035	.0035	.0067	.0060	.0060	.0054	.0047	.0047	.0075	.0067	.0067	.0059	.0090	.0090	.0080	.0070
	38.2	SFM(Vc)	335	335	335	335	370	370	370	335	335	295	440	395	395	395	440	440	395	395
		IPT(fz)	.0006	.0006	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0008	.0012	.0011	.0011	.0011	.0014	.0014	.0013	.0013
		RPM	10820	10820	10820	10820	9020	9020	9020	8120	8120	7210	8520	7670	7670	7670	7100	7100	6390	6390
		IPM(FEED)	14	14	14	14	18	18	18	15	15	11	20	16	16	16	20	20	16	16
		Ap	.0040	.0040	.0035	.0035	.0067	.0060	.0060	.0054	.0047	.0047	.0075	.0067	.0067	.0059	.0090	.0090	.0080	.0070
	39.1	SFM(Vc)	275	275	275	275	305	305	305	275	275	245	340	305	305	305	340	340	305	305
		IPT(fz)	.0005	.0005	.0005	.0005	.0007	.0007	.0007	.0007	.0007	.0006	.0009	.0008	.0008	.0008	.0010	.0010	.0009	.0009
		RPM	8850	8850	8850	8850	7380	7380	7380	6640	6640	5900	6560	5900	5900	5900	5460	5460	4920	4920
		IPM(FEED)	9	9	9	9	11	11	11	9	9	7	11	9	9	9	11	11	9	9
		Ap	.0038	.0038	.0033	.0033	.0063	.0057	.0057	.0050	.0044	.0044	.0071	.0063	.0063	.0055	.0085	.0085	.0076	.0066
	39.2	SFM(Vc)	215	215	215	215	235	235	235	215	215	190	270	245	245	245	270	270	245	245
		IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0006	.0006	.0006	.0005	.0007	.0006	.0006	.0006	.0008	.0008	.0007	.0007
		RPM	6890	6890	6890	6890	5740	5740	5740	5160	5160	4590	5250	4720	4720	4720	4370	4370	3930	3930
		IPM(FEED)	5	5	5	5	7	7	7	6	6	4	7	6	6	6	7	7	6	6
		Ap	.0038	.0038	.0033	.0033	.0063	.0057	.0057	.0050	.0044	.0044	.0071	.0063	.0063	.0055	.0085	.0085	.0076	.0066
	39.3	SFM(Vc)	180	180	180	180	205	205	205	180	180	160	235	215	215	215	235	235	215	215
		IPT(fz)	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0006	.0005	.0005	.0005	.0007	.0007	.0006	.0006
		RPM	5900	5900	5900	5900	4920	4920	4920	4430	4430	3930	4590	4130	4130	4130	3830	3830	3440	3440
		IPM(FEED)	4	4	4	4	5	5	5	4	4	3	5	4	4	4	5	5	4	4
		Ap	.0031	.0031	.0027	.0027	.0051	.0046	.0046	.0041	.0036	.0036	.0058	.0051	.0051	.0045	.0069	.0069	.0061	.0054
	40	SFM(Vc)	500	500	500	500	560	560	560	500	500	445	660	595	595	595	660	660	595	595
		IPT(fz)	.0007	.0007	.0007	.0007	.0011	.0011	.0011	.0009	.0009	.0009	.0013	.0011	.0011	.0011	.0015	.0015	.0013	.0013
		RPM	16230	16230	16230	16230	13520	13520	13520	12170	12170	10820	12790	11510	11510	11510	10660	10660	9590	9590
		IPM(FEED)	23	23	23	23	29	29	29	23	23	19	32	26	26	26	31	31	25	25
		Ap	.0040	.0040	.0035	.0035	.0067	.0060	.0060	.0054	.0047	.0047	.0075	.0067	.0067	.0059	.0090	.0090	.0080	.0070
	41	SFM(Vc)	335	335	335	335	370	370	370	335	335	295	440	395	395	395	440	440	395	395
		IPT(fz)	.0006	.0006	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0008	.0012	.0011	.0011	.0011	.0014	.0014	.0013	.0013
		RPM	10820	10820	10820	10820	9020	9020	9020	8120	8120	7210	8520	7670	7670	7670	7100	7100	6390	6390
		IPM(FEED)	14	14	14	14	18	18	18	15	15	11	20	16	16	16	20	20	16	16
		Ap	.0040	.0040	.0035	.0035	.0067	.0060	.0060	.0054	.0047	.0047	.0075	.0067	.0067	.0059	.0090	.0090	.0080	.0070

YG

Leading Through Innovation

X5070 END MILLS

- For High Hardened Steels (HRc45 to HRc70)

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
X5070 END MILLS

For High Hardened Steels (HRc45 to HRc70)

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C169

						Inch				Metric													
					SERIES	G826	G8A43	G850	G851	G859	G854	G8A46	G8A54	G8A28	G8A38	G8A53	G8A59	G8A36	G8A50	G8A47	G8A37	G8A39	
					FLUTE	4	2	4	6&8	4	4	2	2	2	2	2	3	2	2	4	4	6	
					HELIX ANGLE	0°	30°	30°	45°	0°	0°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	45°	
					CUTTING EDGE SHAPE	CORNER RADIUS	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	
					SIZE MIN	D1/8	R1/64	D1/16	D1/4	D2.0	D2.0	R0.05	R0.25	R0.05	R0.5	R0.2	R1.5	D0.3	D0.3	D3.0	D1.0	D6.0	
					SIZE MAX	D1/2	R1/4	D3/4	D1	D16.0	D16.0	R2.0	R1.0	R6.0	R12.5	R1.0	R10.0	D20.0	D2.0	D12.0	D20.0	D20.0	
					PAGE	C148	C149	C150	C151	C152	C153	C154	C158	C159	C160	C161	C162	C163	C165	C166	C167	C168	
						HIGH FEED	EXTENDED NECK	EXTENDED NECK	-	HIGH FEED	HIGH FEED LONG SHANK	RIB PROCESSING	RIB PROCESSING	-	STUB LENGTH EXTENDED NECK	MINIATURE	-	STUB LENGTH EXTENDED NECK	MINIATURE	EXTENDED NECK	EXTENDED NECK	EXTENDED NECK	
						Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	Blue Coating	
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc																	
P	1	Non-alloy steel	About 0.15% C	Annealed	125																		1
	2		About 0.45% C	Annealed	190	13																	2
	3		About 0.45% C	Quenched & Tempered	250	25																	3
	4		About 0.75% C	Annealed	270	28																	4
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	5
	6	Low alloy steel		Annealed	180	10																	6
	7			Quenched & Tempered	275	29																	7
	8			Quenched & Tempered	300	32	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	8
	9			Quenched & Tempered	350	38	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	9
	10	High alloyed steel, and tool steel		Annealed	200	15																	10
	11			Quenched & Tempered	325	35	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	11
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15																	12
	13		Martensitic	Quenched & Tempered	240	23																	13
	14		Austenitic		180	10																	14
K	15	Grey cast iron	Pearlitic / ferritic		180	10																	15
	16		Pearlitic (Martensitic)		260	26																	16
	17	Nodular cast iron	Ferritic		160	3																	17
	18		Pearlitic		250	25																	18
	19	Malleable cast iron	Ferritic		130																		19
	20		Pearlitic		230	21																	20
N	21	Aluminum-wrought alloy	Not Curable		60																		21
	22		Curable	Hardened	100																		22
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75																		23
	24		≤ 12% Si, Curable	Hardened	90																		24
	25		> 12% Si, Not Curable		130																		25
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110																		26
	27		CuZn, CuSnZn (Brass)		90																		27
	28		CuSn, lead-free copper and electrolytic copper		100																		28
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic																				29
	30		Rubber, Wood, etc.																				30
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15																	31
	32			Cured	280	30																	32
	33		Ni or Co Based	Annealed	250	25																	33
	34			Cured	350	38																	34
	35			Cast	320	34																	35
	36	Titanium Alloys	Pure Titanium		400 Rm																		36
	37		Alpha + Beta Alloys	Hardened	1050 Rm																		37
H	38	Hardened steel		Hardened	550	55	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	38
	39			Hardened	630	60	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	39
	40	Chilled Cast Iron		Cast	400	42	○	○	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	40
	41	Hardened Cast Iron		Hardened	550	55	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	41

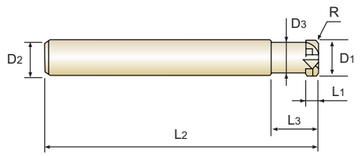
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X5070 END MILLS

PLAIN SHANK **G826** SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

- Excellent wear resistance at heavy feed rates on high hardened material.
- Designed with reduced clearance angles and short flutes for strength.
- High hardness & heat resistance coating for long life in dry applications.



CARBIDE | 4 | R ±.0002 | PLAIN | BLUE

p.C169

High Feed End Mill

◆ U.S.A Stock

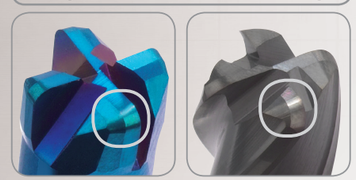
Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
G826082	R1/32	1/8	1/4	.050	3/8	2-1/4	.110
G826124	R1/16	3/16	1/4	.075	3/8	2-1/4	.180
G826164	R1/16	1/4	1/4	.100	1/2	2-1/2	.220
G826206	R3/32	5/16	5/16	.130	5/8	2-1/2	.280
G826246	R3/32	3/8	3/8	.150	3/4	2-3/4	.330
G826328	R1/8	1/2	1/2	.200	1	3-1/4	.460

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance (inch)	Corner Radius Tolerance (inch)	Shank Dia. Tolerance
0~-.0008	±.0002	h5

Comparison of the endteeth shape



Hign Feed End Mill　　Normal End Mill

- Reduced clearance angles and short flutes strengthens corner radius and reduces chattering
- Extra-short flute length for high rigidity
- Heavy core with reduced diameter allows greater depths and maximum rigidity

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

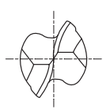
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

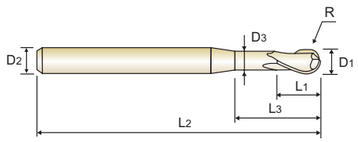
X5070 END MILLS

PLAIN SHANK **G8A43** SERIES

CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.





CARBIDE | 2 | 30° | R ±.0002 | R ±.0004 | PLAIN | BLUE

p.C171

◆ U.S.A Stock

R1/64~R1/8　R5/32~R1/4

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
G8A43002	R1/64	1/32	1/4	1/32	1/16	2	.029
G8A43004	R1/32	1/16	1/4	1/16	1/8	2	.059
G8A43006	R3/64	3/32	1/4	3/32	3/16	2	.090
G8A43008	R1/16	1/8	1/4	1/8	1/4	2-1/2	.121
G8A43012	R3/32	3/16	1/4	3/16	3/8	3	.184
G8A43016	R1/8	1/4	1/4	1/4	1/2	3-1/2	.246
G8A43020	R5/32	5/16	5/16	5/16	5/8	4	.309
G8A43024	R3/16	3/8	3/8	3/8	3/4	4	.371
G8A43032	R1/4	1/2	1/2	1/2	1	4-1/2	.496

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h5
over Ø1/4	±.0004	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G850** SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.

CARBIDE | 4 | 30° | R ±.0002 | PLAIN | BLUE

p.C172

◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
G85004	R.004	1/16	1/8	3/32	-	1-1/2	-
G85008	R.004	1/8	1/4	5/32	1/4	2	.119
G85012	R.004	3/16	1/4	1/4	3/8	2	.181
G85016	R.008	1/4	1/4	5/16	9/16	2	.238
G85020	R.008	5/16	5/16	3/8	3/4	2-1/2	.301
G85024	R.008	3/8	3/8	1/2	1	3	.363
G85032	R.012	1/2	1/2	5/8	1-3/16	3	.488
G85040	R.012	5/8	5/8	3/4	1-1/2	3-1	.613
G85048	R.012	3/4	3/4	1	1-3/4	4	.738

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h5
over Ø1/4	±.0004	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

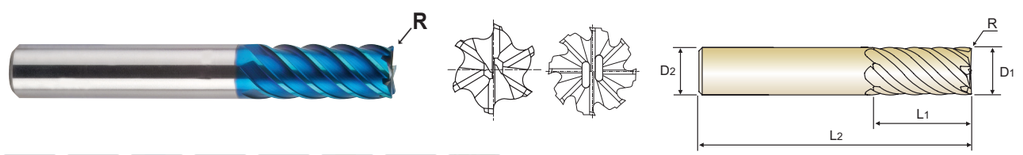
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	◎	◎

YG X5070 END MILLS

PLAIN SHANK **G851** SERIES

CARBIDE, 6&8 FLUTE 45° HELIX CORNER RADIUS

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.



CARBIDE | 6&8 | 45° | R ±.0002 | PLAIN | BLUE

p.C173

◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
G85116	R.02	1/4	1/4	1/2	2-1/4	6
G85120	R.02	5/16	5/16	3/4	2-1/2	6
G85125	R.03	3/8	3/8	7/8	2-7/8	6
G85133	R.03	1/2	1/2	1	3-1/4	6
G85140	R.03	5/8	5/8	1-1/4	3-5/8	6
G85141	R.06	5/8	5/8	1-1/4	3-5/8	6
G85148	R.03	3/4	3/4	1-1/2	4-1/8	8
G85149	R.06	3/4	3/4	1-1/2	4-1/8	8
G85164	R.03	1	1	1-3/4	4-1/4	8
G85165	R.06	1	1	1-3/4	4-1/4	8
G85167	R.03	1	1	4-1/8	7	8
G85168	R.06	1	1	4-1/8	7	8

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h5
over Ø1/4	±.0004	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

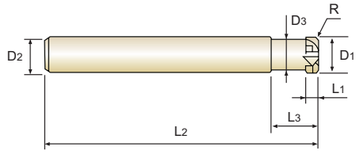
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	◎	◎

X5070 END MILLS

PLAIN SHANK **G859 SERIES**

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

- Excellent wear resistance at heavy feed rates on high hardened material.
- Designed with reduced clearance angles and short flutes for strength.
- High hardness & heat resistance coating for long life in dry applications.



CARBIDE | 4 | PLAIN | R ±0.005 | BLUE

p.C174

High Feed End Mill

◆ U.S.A Stock

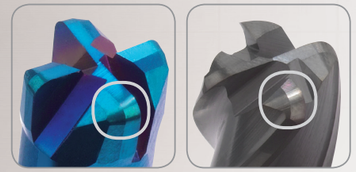
Unit : mm

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R	D1		D2	L1	L3	L2	D3
G859020	R0.5	2.0	.0787	6	1	6	50	1.8
G859030	R0.5	3.0	.1181	6	1.2	8	50	2.8
G859040	R0.5	4.0	.1575	6	1.5	10	50	3.8
G859060	R0.5	6.0	.2362	6	2.5	12	60	5.4
G859061	R1.0	6.0	.2362	6	2.5	12	60	5.4
G859081	R1.0	8.0	.3150	8	3.5	16	60	7.2
G859082	R2.0	8.0	.3150	8	3.5	16	60	7.2
G859101	R1.0	10.0	.3937	10	4	20	70	9
G859102	R2.0	10.0	.3937	10	4	20	70	9
G859122	R2.0	12.0	.4724	12	5	25	80	11
G859123	R3.0	12.0	.4724	12	5	25	80	11
G859163	R3.0	16.0	.6299	16	6.5	30	90	15

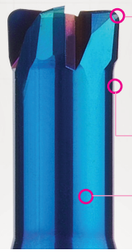
The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance (inch)	Corner Radius Tolerance (inch)	Shank Dia. Tolerance
0~-.0008	±.0002	h5

Comparison of the endteeth shape



High Feed End Mill　Normal End Mill



- Reduced clearance angles and short flutes strengthens corner radius and reduces chattering
- Extra-short flute length for high rigidity
- Heavy core with reduced diameter allows greater depths and maximum rigidity

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

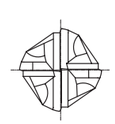
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

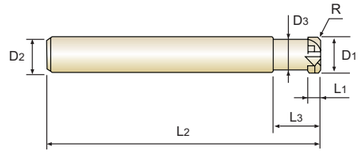
X5070 END MILLS

PLAIN SHANK **G854 SERIES**

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED (Long Shank)

- Excellent wear resistance at heavy feed rates on high hardened material.
- Designed with reduced clearance angles and short flutes for strength.
- High hardness & heat resistance coating for long life in dry applications.





CARBIDE | 4 | PLAIN | R ±0.005 | BLUE

p.C174

High Feed End Mill

◆ U.S.A Stock

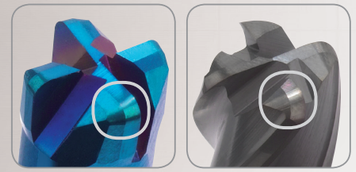
Unit : mm

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R	D1		D2	L1	L3	L2	D3
G854020	R0.5	2.0	.0787	6	1	6	70	1.8
G854030	R0.5	3.0	.1181	6	1.2	8	70	2.8
G854040	R0.5	4.0	.1575	6	1.5	10	70	3.8
G854050	R1.0	5.0	.1969	6	2	10	70	4.6
G854060	R0.5	6.0	.2362	6	2.5	12	90	5.4
G854061	R1.0	6.0	.2362	6	2.5	12	90	5.4
G854062	R1.5	6.0	.2362	6	2.5	12	90	5.4
G854081	R1.0	8.0	.3150	8	3.5	16	100	7.2
G854082	R2.0	8.0	.3150	8	3.5	16	100	7.2
G854101	R1.0	10.0	.3937	10	4	20	100	9
G854102	R2.0	10.0	.3937	10	4	20	100	9
G854122	R2.0	12.0	.4724	12	5	25	110	11
G854123	R3.0	12.0	.4724	12	5	25	110	11
G854163	R3.0	16.0	.6299	16	6.5	30	130	15

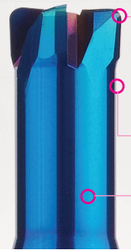
The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance (inch)	Corner Radius Tolerance (inch)	Shank Dia. Tolerance
0~-.0008	±.0002	h5

Comparison of the endteeth shape



High Feed End Mill　Normal End Mill



- Reduced clearance angles and short flutes strengthens corner radius and reduces chattering
- Extra-short flute length for high rigidity
- Heavy core with reduced diameter allows greater depths and maximum rigidity

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

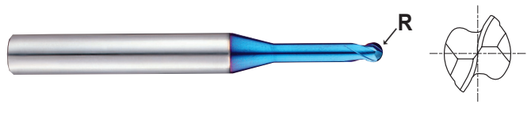
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A46** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | BLUE

p.C176

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.005)	D1		D2	L1	L3	L2	D3
G8A46805	R0.05	0.1	.0039	4	0.1	0.3	45	0.085
G8A46806	R0.05	0.1	.0039	4	0.1	0.5	45	0.085
G8A46002	R0.1	0.2	.0079	4	0.2	0.5	45	0.17
G8A46977	R0.1	0.2	.0079	4	0.2	1	45	0.17
G8A46958	R0.1	0.2	.0079	4	0.2	1.5	45	0.17
G8A46003	R0.15	0.3	.0118	4	0.3	1	45	0.27
G8A46959	R0.15	0.3	.0118	4	0.3	2	45	0.27
G8A46986	R0.15	0.3	.0118	4	0.3	3	45	0.27
G8A46004	R0.2	0.4	.0157	4	0.4	1	45	0.37
G8A46960	R0.2	0.4	.0157	4	0.4	2	45	0.37
G8A46961	R0.2	0.4	.0157	4	0.4	3	45	0.37
G8A46981	R0.2	0.4	.0157	4	0.4	4	45	0.37
G8A46987	R0.2	0.4	.0157	4	0.4	5	45	0.37
G8A46005	R0.25	0.5	.0197	4	0.4	2	45	0.45
G8A46804	R0.25	0.5	.0197	4	0.4	2.5	45	0.45
G8A46962	R0.25	0.5	.0197	4	0.4	4	45	0.45
G8A46963	R0.25	0.5	.0197	4	0.4	6	45	0.45
G8A46964	R0.25	0.5	.0197	4	0.4	8	45	0.45
G8A46957	R0.3	0.6	.0236	4	0.5	2	45	0.55
G8A46988	R0.3	0.6	.0236	4	0.5	3	45	0.55
G8A46915	R0.3	0.6	.0236	4	0.5	4	45	0.55
G8A46989	R0.3	0.6	.0236	4	0.5	5	45	0.55
G8A46916	R0.3	0.6	.0236	4	0.5	6	45	0.55
G8A46917	R0.3	0.6	.0236	4	0.5	8	45	0.55

▶NEXT PAGE

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

ISO	N									S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

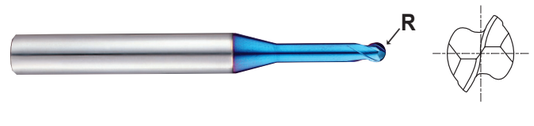
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG X5070 END MILLS

PLAIN SHANK G8A46 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | BLUE

p.C176

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.005)	D1		D2	L1	L3	L2	D3
G8A46990	R0.3	0.6	.0236	4	0.5	10	45	0.55
G8A46918	R0.4	0.8	.0315	4	0.6	2	45	0.75
G8A46919	R0.4	0.8	.0315	4	0.6	4	45	0.75
G8A46008	R0.4	0.8	.0315	4	0.6	6	45	0.75
G8A46901	R0.4	0.8	.0315	4	0.6	8	45	0.75
G8A46965	R0.4	0.8	.0315	4	0.6	10	45	0.75
G8A46920	R0.5	1.0	.0394	4	0.8	3	45	0.95
G8A46921	R0.5	1.0	.0394	4	0.8	4	45	0.95
G8A46923	R0.5	1.0	.0394	4	0.8	5	45	0.95
G8A46010	R0.5	1.0	.0394	4	0.8	6	45	0.95
G8A46924	R0.5	1.0	.0394	4	0.8	7	45	0.95
G8A46902	R0.5	1.0	.0394	4	0.8	8	45	0.95
G8A46925	R0.5	1.0	.0394	4	0.8	9	45	0.95
G8A46903	R0.5	1.0	.0394	4	0.8	10	45	0.95
G8A46904	R0.5	1.0	.0394	4	0.8	12	45	0.95
G8A46926	R0.5	1.0	.0394	4	0.8	14	50	0.95
G8A46927	R0.5	1.0	.0394	4	0.8	16	50	0.95
G8A46966	R0.5	1.0	.0394	4	0.8	20	55	0.95
G8A46982	R0.6	1.2	.0472	4	1.0	6	45	1.15
G8A46012	R0.6	1.2	.0472	4	1.0	8	45	1.15
G8A46983	R0.6	1.2	.0472	4	1.0	10	45	1.15
G8A46905	R0.6	1.2	.0472	4	1.0	12	45	1.15
G8A46930	R0.75	1.5	.0472	4	1.2	6	45	1.45
G8A46015	R0.75	1.5	.0472	4	1.2	8	45	1.45

▶NEXT PAGE

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

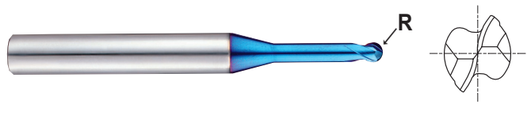
ISO	N									S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A46** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | BLUE

p.C176

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.005)	D1		D2	L1	L3	L2	D3
G8A46931	R0.75	1.5	.0472	4	1.2	10	45	1.45
G8A46906	R0.75	1.5	.0472	4	1.2	12	45	1.45
G8A46992	R0.75	1.5	.0472	4	1.2	14	50	1.45
G8A46907	R0.75	1.5	.0472	4	1.2	16	50	1.45
G8A46932	R0.75	1.5	.0472	4	1.2	20	55	1.45
G8A46939	R1.0	2.0	.0787	4	1.6	4	45	1.95
G8A46940	R1.0	2.0	.0787	4	1.6	6	45	1.95
G8A46020	R1.0	2.0	.0787	4	1.6	8	45	1.95
G8A46941	R1.0	2.0	.0787	4	1.6	10	45	1.95
G8A46942	R1.0	2.0	.0787	4	1.6	12	50	1.95
G8A46943	R1.0	2.0	.0787	4	1.6	14	50	1.95
G8A46909	R1.0	2.0	.0787	4	1.6	16	50	1.95
G8A46993	R1.0	2.0	.0787	4	1.6	18	55	1.95
G8A46910	R1.0	2.0	.0787	4	1.6	20	55	1.95
G8A46944	R1.0	2.0	.0787	4	1.6	22	60	1.95
G8A46945	R1.0	2.0	.0787	4	1.6	25	60	1.95
G8A46967	R1.0	2.0	.0787	4	1.6	30	70	1.95
G8A46948	R1.5	3.0	.1181	6	2.4	12	50	2.85
G8A46984	R1.5	3.0	.1181	6	2.4	14	55	2.85
G8A46030	R1.5	3.0	.1181	6	2.4	16	55	2.85
G8A46985	R1.5	3.0	.1181	6	2.4	18	60	2.85
G8A46911	R1.5	3.0	.1181	6	2.4	20	60	2.85
G8A46968	R1.5	3.0	.1181	6	2.4	25	65	2.85
G8A46969	R1.5	3.0	.1181	6	2.4	30	70	2.85

▶NEXT PAGE

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

ISO	N									S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

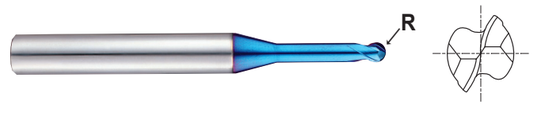
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL
INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG X5070 END MILLS

PLAIN SHANK G8A46 SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | BLUE

p.C176

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.005)	D1		D2	L1	L3	L2	D3
G8A46970	R1.5	3.0	.1181	6	2.4	35	80	2.85
G8A46950	R2.0	4.0	.1575	6	3.2	12	60	3.85
G8A46040	R2.0	4.0	.1575	6	3.2	16	60	3.85
G8A46912	R2.0	4.0	.1575	6	3.2	20	65	3.85
G8A46913	R2.0	4.0	.1575	6	3.2	25	70	3.85
G8A46971	R2.0	4.0	.1575	6	3.2	30	70	3.85
G8A46972	R2.0	4.0	.1575	6	3.2	35	80	3.85
G8A46973	R2.0	4.0	.1575	6	3.2	40	90	3.85
G8A46974	R2.0	4.0	.1575	6	3.2	45	90	3.85
G8A46975	R2.0	4.0	.1575	6	3.2	50	100	3.85

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

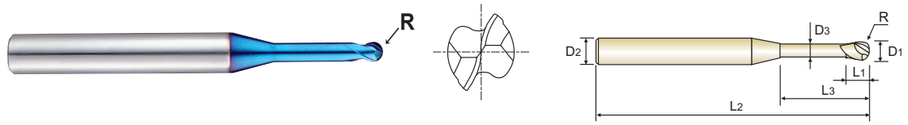
ISO	N									S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A54** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | BLUE | R ±0.005 | PLAIN | 30° p.C176

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.005)	D1		D2	L1	L3	L2	D3
G8A54005	R0.25	0.5	.0197	6	0.5	1.5	50	0.45
G8A54901	R0.25	0.5	.0197	6	0.5	3.3	50	0.45
G8A54006	R0.3	0.6	.0236	6	0.6	2	50	0.55
G8A54902	R0.3	0.6	.0236	6	0.6	4	50	0.55
G8A54008	R0.4	0.8	.0315	6	0.8	2.5	50	0.75
G8A54903	R0.4	0.8	.0315	6	0.8	5.5	50	0.75
G8A54010	R0.5	1.0	.0394	6	1	3.3	50	0.95
G8A54904	R0.5	1.0	.0394	6	1	6.7	50	0.95
G8A54905	R0.5	1.0	.0394	6	1	12	50	0.95
G8A54012	R0.6	1.2	.0472	6	1.2	4.4	50	1.15
G8A54906	R0.6	1.2	.0472	6	1.2	8	50	1.15
G8A54015	R0.75	1.5	.0591	6	1.5	5	50	1.45
G8A54907	R0.75	1.5	.0591	6	1.5	9.7	50	1.45
G8A54908	R0.75	1.5	.0591	6	1.5	15	50	1.45
G8A54020	R1.0	2.0	.0787	6	2	6	50	1.95
G8A54909	R1.0	2.0	.0787	6	2	13	50	1.95
G8A54910	R1.0	2.0	.0787	6	2	20	60	1.95

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

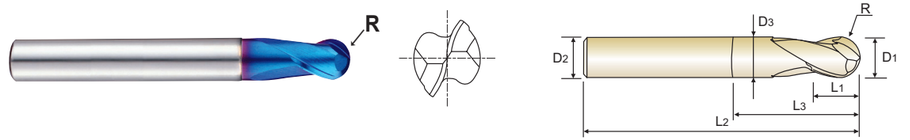
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A28** SERIES

CARBIDE, 2 FLUTE BALL NOSE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | BLUE p.C177

R0.5~R3 R3.5~R6

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R	D1		D2	L1	L3	L2	D3
G8A28001	R0.05	0.1	.0039	4	0.2	-	40	-
G8A28002	R0.1	0.2	.0079	4	0.3	-	40	-
G8A28003	R0.15	0.3	.0118	4	0.5	-	40	-
G8A28004	R0.2	0.4	.0157	4	0.6	-	40	-
G8A28005	R0.25	0.5	.0197	4	0.7	-	40	-
G8A28006	R0.3	0.6	.0236	4	0.9	-	40	-
G8A28007	R0.35	0.7	.0276	4	1.1	-	40	-
G8A28008	R0.4	0.8	.0315	4	1.2	-	40	-
G8A28009	R0.45	0.9	.0354	4	1.4	-	40	-
G8A280104S	R0.5	1.0	.0394	4	1.5	3	50	0.95
G8A28010	R0.5	1.0	.0394	6	1.5	3	50	0.95
G8A280154S	R0.75	1.5	.0591	4	2	4	50	1.45
G8A28015	R0.75	1.5	.0591	6	2	4	50	1.45
G8A280204S	R1.0	2.0	.0787	4	2.5	5	50	1.95
G8A28020	R1.0	2.0	.0787	6	2.5	5	50	1.95
G8A280254S	R1.25	2.5	.0984	4	3	7	50	2.4
G8A28025	R1.25	2.5	.0984	6	3	7	50	2.4
G8A28030	R1.5	3.0	.1181	6	4	10	60	2.85
G8A28035	R1.75	3.5	.1378	6	4.5	10	60	3.35
G8A28040	R2.0	4.0	.1575	6	5	10	60	3.85
G8A28045	R2.25	4.5	.1772	6	5.5	10	60	4.35
G8A28050	R2.5	5.0	.1969	6	6	12	60	4.85
G8A28055	R2.75	5.5	.2165	6	6.5	12	60	5.35
G8A28060	R3.0	6.0	.2362	6	7	15	60	5.85
G8A28903	R3.0	6.0	.2362	6	9	30	90	5.85
G8A28901	R4.0	8.0	.3150	8	9	15	60	7.7
G8A28080	R4.0	8.0	.3150	8	9	15	80	7.7
G8A28904	R4.0	8.0	.3150	8	12	30	100	7.7
G8A28902	R5.0	10.0	.3937	10	11	25	60	9.7
G8A28100	R5.0	10.0	.3937	10	11	25	80	9.7
G8A28905	R5.0	10.0	.3937	10	15	30	100	9.7
G8A28120	R6.0	12.0	.4724	12	14	25	80	11.7

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0 ~ - 0.012	h5
over R3	±0.010	0 ~ - 0.015	

The original bright blue color may discolor during use, however, the performance will not be negatively affected

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

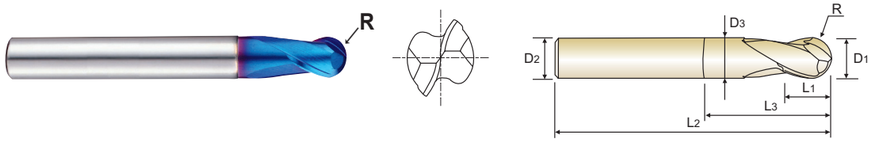
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

X5070 END MILLS

PLAIN SHANK **G8A38** SERIES

CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.005 R0.5~R3 | R ±0.010 R3.5~R12.5 | PLAIN | BLUE

p.C177

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1		D2	L1	L3	L2	D3
G8A38010	R0.5	1.0	.0394	4	1	2.2	50	0.95
G8A38012	R0.6	1.2	.0472	4	1.2	2.6	50	1.15
G8A38015	R0.75	1.5	.0591	4	1.5	3	50	1.45
G8A380204S	R1.0	2.0	.0787	4	2	4	50	1.95
G8A38020	R1.0	2.0	.0787	6	2	4	50	1.95
G8A38030	R1.5	3.0	.1181	6	3	6	60	2.85
G8A38040	R2.0	4.0	.1575	6	4	8	70	3.85
G8A38050	R2.5	5.0	.1969	6	5	10	80	4.85
G8A38060	R3.0	6.0	.2362	6	6	12	90	5.85
G8A38070	R3.5	7.0	.2756	8	7	14	90	6.7
G8A38080	R4.0	8.0	.3150	8	8	16	100	7.7
G8A38090	R4.5	9.0	.3543	10	9	18	100	8.7
G8A38100	R5.0	10.0	.3937	10	10	20	100	9.7
G8A38120	R6.0	12.0	.4724	12	12	24	110	11.7
G8A38140	R7.0	14.0	.5512	14	14	28	110	13.7
G8A38160	R8.0	16.0	.6299	16	16	32	140	15.7
G8A38180	R9.0	18.0	.7087	18	18	36	140	17.7
G8A38200	R10.0	20.0	.7874	20	20	40	160	19.7
G8A38250	R12.5	25.0	.9843	25	25	50	180	24.7

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0 ~ - 0.012	h5
over R3	±0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

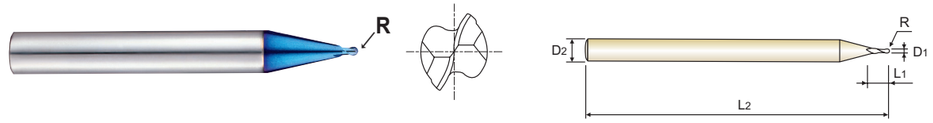
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

X5070 END MILLS

PLAIN SHANK **G8A53** SERIES

CARBIDE, 2 FLUTE MINIATURE BALL NOSE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | BLUE

p.C177

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
	R (±0.005)	D1		D2	L1	L2
G8A53004	R0.2	0.4	.0157	6	0.4	50
G8A53005	R0.25	0.5	.0197	6	0.5	50
G8A53006	R0.3	0.6	.0236	6	0.6	50
G8A53008	R0.4	0.8	.0315	6	0.8	50
G8A53010	R0.5	1.0	.0394	6	1.0	50
G8A53012	R0.6	1.2	.0472	6	1.2	50
G8A53015	R0.75	1.5	.0591	6	1.5	50
G8A53020	R1.0	2.0	.0787	6	2.0	50

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

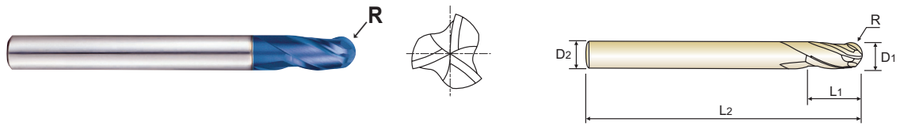
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A59** SERIES

CARBIDE, 3 FLUTE BALL NOSE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.



CARBIDE | 3 | 30° | R ±0.005 (R1.5~R3) | R ±0.010 (R4~R10) | PLAIN | BLUE p.C179

◆ U.S.A Stock

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
		Metric	Inch			
	R	D1		D2	L1	L2
G8A59030	R1.5	3.0	.1181	6	8	60
G8A59040	R2.0	4.0	.1575	6	8	70
G8A59050	R2.5	5.0	.1969	6	10	80
G8A59060	R3.0	6.0	.2362	6	12	90
G8A59080	R4.0	8.0	.3150	8	14	100
G8A59100	R5.0	10.0	.3937	10	18	100
G8A59120	R6.0	12.0	.4724	12	22	110
G8A59160	R8.0	16.0	.6299	16	30	140
G8A59200	R10.0	20.0	.7874	20	38	160

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0 ~ - 0.012	h5
over R3	±0.010	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

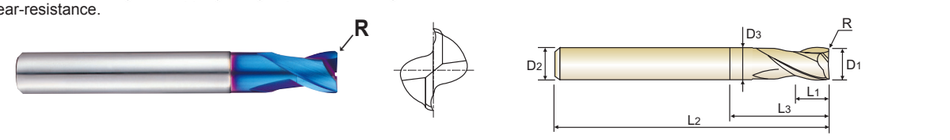
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A36** SERIES

CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.3~Ø6) | R ±0.015 (Ø8~Ø20) | PLAIN | BLUE p.C180

◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R	D1		D2	L1	L3	L2	D3
G8A36003	-	0.3	.0118	3	0.45	-	40	-
G8A36004	-	0.4	.0157	3	0.6	-	40	-
G8A36005	R0.05	0.5	.0197	3	0.7	-	40	-
G8A36907	R0.05	0.5	.0197	4	1	-	40	-
G8A36006	R0.05	0.6	.0236	3	0.9	-	40	-
G8A36908	R0.05	0.6	.0236	4	1.2	-	40	-
G8A36909	R0.05	0.7	.0276	4	1.4	-	40	-
G8A36008	R0.05	0.8	.0315	3	1.2	-	40	-
G8A36910	R0.05	0.8	.0315	4	1.6	-	40	-
G8A36911	R0.05	0.9	.0354	4	2	-	40	-
G8A36010	R0.1	1.0	.0394	3	1.5	-	40	-
G8A36901	R0.1	1.0	.0394	4	1.5	-	40	-
G8A36903	R0.1	1.0	.0394	6	1.5	-	40	-
G8A36015	R0.1	1.5	.0591	3	2.2	-	40	-
G8A36904	R0.1	1.5	.0591	6	2.2	-	40	-
G8A36020	R0.1	2.0	.0787	3	3	6	40	1.95
G8A36902	R0.1	2.0	.0787	4	3	6	40	1.95
G8A36905	R0.1	2.0	.0787	6	3	6	40	1.95
G8A36025	R0.1	2.5	.0984	3	4	6	40	2.4
G8A36906	R0.1	2.5	.0984	6	4	6	40	2.4
G8A36030	R0.1	3.0	.1181	6	4	7	45	2.85
G8A36035	R0.1	3.5	.1378	6	5	9	45	3.35
G8A36040	R0.1	4.0	.1575	6	5	9	45	3.85
G8A36045	R0.1	4.5	.1772	6	6	10	45	4.35

▶NEXT PAGE

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

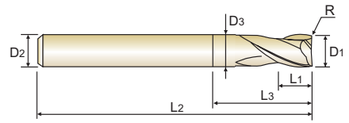
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

X5070 END MILLS

PLAIN SHANK **G8A36** SERIES

CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.010 (Ø0.3~Ø6) | R ±0.015 (Ø8~Ø20) | PLAIN | BLUE

p.C180

◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1		D2	L1	L3	L2	D3
G8A36050	R0.2	5.0	.1969	6	6	11	50	4.85
G8A36060	R0.2	6.0	.2362	6	7	14	50	5.85
G8A36080	R0.2	8.0	.3150	8	9	18	60	7.7
G8A36100	R0.2	10.0	.3937	10	12	25	75	9.7
G8A36120	R0.3	12.0	.4724	12	15	30	75	11.7
G8A36160	R0.3	16.0	.6299	16	18	38	90	15.7
G8A36200	R0.3	20.0	.7874	20	24	45	100	19.7

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

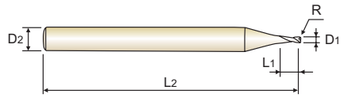
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

X5070 END MILLS

PLAIN SHANK **G8A50** SERIES

CARBIDE, 2 FLUTE MINIATURE CORNER RADIUS

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.



CARBIDE | 2 | 30° | R ±0.010 | PLAIN | BLUE

p.C183

◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
	R (±0.010)	D1		D2	L1	L2
G8A50003	-	0.3	.0118	6	0.45	50
G8A50004	-	0.4	.0157	6	0.6	50
G8A50005	R0.05	0.5	.0197	6	0.7	50
G8A50006	R0.05	0.6	.0236	6	0.9	50
G8A50008	R0.05	0.8	.0315	6	1.2	50
G8A50010	R0.1	1.0	.0394	6	1.5	50
G8A50012	R0.1	1.2	.0472	6	1.8	50
G8A50015	R0.15	1.5	.0591	6	2.2	50
G8A50020	R0.15	2.0	.0787	6	2.2	50

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

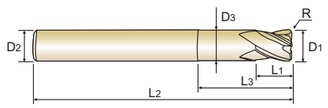
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A47** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.



CARBIDE | 4 | 30° | R ±0.010 | R ±0.015 | PLAIN | BLUE

p.C184

◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1		D2	L1	L3	L2	D3
G8A47916	R0.3	3.0	.1181	6	4	12	55	2.85
G8A47917	R0.3	3.0	.1181	6	4	16	55	2.85
G8A47918	R0.3	3.0	.1181	6	4	20	55	2.85
G8A47030	R0.5	3.0	.1181	6	4	10	55	2.85
G8A47901	R0.5	3.0	.1181	6	4	16	55	2.85
G8A47902	R0.5	3.0	.1181	6	4	20	55	2.85
G8A47919	R0.3	4.0	.1575	6	5	12	55	3.85
G8A47920	R0.3	4.0	.1575	6	5	16	55	3.85
G8A47921	R0.3	4.0	.1575	6	5	20	55	3.85
G8A47040	R0.5	4.0	.1575	6	5	12	55	3.85
G8A47903	R0.5	4.0	.1575	6	5	16	55	3.85
G8A47904	R0.5	4.0	.1575	6	5	20	55	3.85
G8A47922	R1.0	4.0	.1575	6	5	12	55	3.85
G8A47060	R0.5	6.0	.2362	6	7	20	60	5.85
G8A47905	R1.0	6.0	.2362	6	7	20	60	5.85
G8A47906	R1.5	6.0	.2362	6	7	20	60	5.85
G8A47910	R0.5	8.0	.3150	8	9	25	60	7.7
G8A47080	R1.0	8.0	.3150	8	9	25	60	7.7
G8A47907	R1.5	8.0	.3150	8	9	25	60	7.7
G8A47913	R2.0	8.0	.3150	8	9	25	60	7.7
G8A47911	R0.5	10.0	.3937	10	11	32	70	9.7
G8A47100	R1.0	10.0	.3937	10	11	32	70	9.7
G8A47908	R1.5	10.0	.3937	10	11	32	70	9.7
G8A47914	R2.0	10.0	.3937	10	11	32	70	9.7
G8A47912	R0.5	12.0	.4724	12	12	38	80	11.7
G8A47120	R1.0	12.0	.4724	12	12	38	80	11.7
G8A47909	R1.5	12.0	.4724	12	12	38	80	11.7
G8A47915	R2.0	12.0	.4724	12	12	38	80	11.7

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

The original bright blue color may discolor during use, however, the performance will not be negatively affected

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

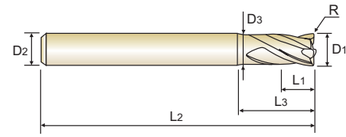
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

YG X5070 END MILLS

PLAIN SHANK **G8A37** SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.



CARBIDE | 4 | 30° | R ±0.010 | R ±0.015 | PLAIN | BLUE

p.C185

◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1		D2	L1	L3	L2	D3
G8A37010	R0.1	1.0	.0394	3	1.5	-	40	-
G8A37901	R0.1	1.0	.0394	6	1.5	-	40	-
G8A37015	R0.1	1.5	.0591	3	2.2	-	40	-
G8A37902	R0.1	1.5	.0591	6	2.2	-	40	-
G8A37020	R0.1	2.0	.0787	3	3	6	40	1.95
G8A37903	R0.1	2.0	.0787	6	3	6	40	1.95
G8A37025	R0.1	2.5	.0984	3	4	6	40	2.4
G8A37904	R0.1	2.5	.0984	6	4	6	40	2.4
G8A37030	R0.1	3.0	.1181	6	4	7	45	2.85
G8A37035	R0.1	3.5	.1378	6	5	9	45	3.35
G8A37040	R0.1	4.0	.1575	6	5	9	45	3.85
G8A37045	R0.1	4.5	.1772	6	6	10	45	4.35
G8A37050	R0.2	5.0	.1969	6	6	11	50	4.85
G8A37060	R0.2	6.0	.2362	6	7	14	50	5.85
G8A37080	R0.2	8.0	.3150	8	9	18	60	7.7
G8A37100	R0.2	10.0	.3937	10	12	25	75	9.7
G8A37120	R0.3	12.0	.4724	12	15	30	75	11.7
G8A37160	R0.3	16.0	.6299	16	18	38	90	15.7
G8A37200	R0.3	20.0	.7874	20	24	45	100	19.7

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0 ~ - 0.012	h5
over Ø6	±0.015	0 ~ - 0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

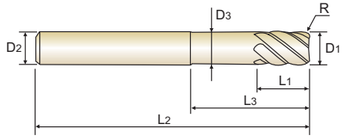
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

X5070 END MILLS

PLAIN SHANK **G8A39 SERIES**

CARBIDE, 6 FLUTE 45º HELIX CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.



CARBIDE | 6 | 45° | R ±0.010 (Ø6) | R ±0.015 (Ø8~Ø12) | PLAIN | BLUE

p.C186

◆ U.S.A Stock

Unit : mm

EDP No.	Corner Radius	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1		D2	L1	L3	L2	D3
G8A39916	R0.25	6.0	.2362	6	6	14	50	5.85
G8A39060	R0.5	6.0	.2362	6	6	14	50	5.85
G8A39901	R0.5	6.0	.2362	6	13	-	70	-
* G8A39910	R0.5	6.0	.2362	6	26	-	70	-
G8A39080	R0.5	8.0	.3150	8	8	24	60	7.7
G8A39902	R0.5	8.0	.3150	8	19	-	90	-
* G8A39911	R0.5	8.0	.3150	8	36	-	90	-
G8A39903	R0.5	10.0	.3937	10	22	-	100	-
G8A39100	R1.0	10.0	.3937	10	10	30	70	9.7
G8A39904	R1.0	10.0	.3937	10	22	-	100	-
* G8A39912	R1.0	10.0	.3937	10	46	-	100	-
G8A39905	R0.5	12.0	.4724	12	26	-	110	-
G8A39120	R1.0	12.0	.4724	12	12	30	75	11.7
G8A39906	R1.0	12.0	.4724	12	26	-	110	-
* G8A39913	R1.0	12.0	.4724	12	56	-	110	-
G8A39160	R1.0	16.0	.6299	16	32	-	130	-
G8A39907	R1.5	16.0	.6299	16	32	-	130	-
* G8A39914	R1.5	16.0	.6299	16	66	-	130	-
G8A39200	R1.0	20.0	.7874	20	38	-	140	-
G8A39908	R1.5	20.0	.7874	20	38	-	140	-
G8A39909	R2.0	20.0	.7874	20	38	-	140	-
* G8A39915	R2.0	20.0	.7874	20	76	-	140	-

The original bright blue color may discolor during use, however, the performance will not be negatively affected

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0~-0.02 (*Extra Long Type : 0~-0.03)	h5
over Ø6	±0.015		

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					○			○	○		○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎	◎	○	◎

X5070 END MILLS

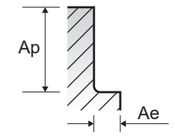
RECOMMENDED CUTTING CONDITIONS

G826 SERIES 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(HIGH SPEED)

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2
P	5	Non-alloy steel	32	0.3D	0.1R	SFM(Vc)	685	810	820	820	835	850
						IPT(fz)	.0071	.0109	.0144	.0180	.0212	.0277
						RPM	21000	16500	12500	10000	8500	6500
						IPM(FEED)	600	720	720	720	720	720
	8-9	Low alloy steel	32-38	0.3D	0.1R	SFM(Vc)	685	810	820	820	835	850
						IPT(fz)	.0071	.0109	.0144	.0180	.0212	.0277
						RPM	21000	16500	12500	10000	8500	6500
						IPM(FEED)	600	720	720	720	720	720
	11.1	High alloyed steel, and tool steel	35	0.3D	0.1R	SFM(Vc)	685	810	820	820	835	850
						IPT(fz)	.0071	.0109	.0144	.0180	.0212	.0277
						RPM	21000	16500	12500	10000	8500	6500
						IPM(FEED)	600	720	720	720	720	720
	11.2		44	0.3D	0.1R	SFM(Vc)	525	665	655	655	660	655
						IPT(fz)	.0059	.0102	.0138	.0172	.0205	.0275
						RPM	16000	13500	10000	8000	6700	5000
						IPM(FEED)	380	550	550	550	550	550
H	38.1	Hardened steel	45-49	0.3D	0.1R	SFM(Vc)	525	665	655	655	660	655
						IPT(fz)	.0059	.0102	.0138	.0172	.0205	.0275
						RPM	16000	13500	10000	8000	6700	5000
						IPM(FEED)	380	550	550	550	550	550
	38.2		50-55	0.3D	0.1R	SFM(Vc)	395	565	555	555	560	565
						IPT(fz)	.0063	.0091	.0124	.0154	.0184	.0244
						RPM	12000	11500	8500	6800	5700	4300
						IPM(FEED)	300	420	420	420	420	420
	39.1		56-60	0.3D	0.05R	SFM(Vc)	295	395	395	395	395	395
						IPT(fz)	.0047	.0078	.0104	.0130	.0156	.0208
						RPM	9000	8000	6000	4800	4000	3000
						IPM(FEED)	170	250	250	250	250	250
	39.2		61-65	0.3D	0.05R	SFM(Vc)	215	280	280	280	280	280
						IPT(fz)	.0035	.0066	.0087	.0110	.0132	.0174
						RPM	6500	5700	4300	3400	2850	2150
						IPM(FEED)	92	150	150	150	150	150
	40	Chilled Cast Iron	42	0.3D	0.1R	SFM(Vc)	525	665	655	655	660	655
						IPT(fz)	.0059	.0102	.0138	.0172	.0205	.0275
						RPM	16000	13500	10000	8000	6700	5000
						IPM(FEED)	380	550	550	550	550	550
	41	Hardened Cast Iron	55	0.3D	0.1R	SFM(Vc)	395	565	555	555	560	565
						IPT(fz)	.0063	.0091	.0124	.0154	.0184	.0244
						RPM	12000	11500	8500	6800	5700	4300
						IPM(FEED)	300	420	420	420	420	420



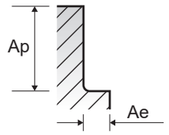
X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G826 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

(NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2
P	5	Non-alloy steel	32	0.5D	0.2R	SFM(Vc)	295	370	360	370	375	365
						IPT(fz)	.0068	.0103	.0141	.0172	.0204	.0277
						RPM	9000	7500	5500	4500	3800	2800
						IPM(FEED)	245	310	310	310	310	310
	8-9	Low alloy steel	32-38	0.5D	0.2R	SFM(Vc)	295	370	360	370	375	365
						IPT(fz)	.0068	.0103	.0141	.0172	.0204	.0277
						RPM	9000	7500	5500	4500	3800	2800
						IPM(FEED)	245	310	310	310	310	310
	11.1	High alloyed steel, and tool steel	35	0.5D	0.2R	SFM(Vc)	295	370	360	370	375	365
						IPT(fz)	.0068	.0103	.0141	.0172	.0204	.0277
						RPM	9000	7500	5500	4500	3800	2800
						IPM(FEED)	245	310	310	310	310	310
	11.2		44	0.5D	0.2R	SFM(Vc)	215	250	255	255	255	255
						IPT(fz)	.0060	.0098	.0128	.0161	.0192	.0256
						RPM	6500	5100	3900	3100	2600	1950
						IPM(FEED)	155	200	200	200	200	200
H	38.1	Hardened steel	45-49	0.5D	0.2R	SFM(Vc)	215	250	255	255	255	255
						IPT(fz)	.0060	.0098	.0128	.0161	.0192	.0256
						RPM	6500	5100	3900	3100	2600	1950
						IPM(FEED)	155	200	200	200	200	200
	38.2		50-55	0.5D	0.2R	SFM(Vc)	140	185	185	180	180	185
						IPT(fz)	.0058	.0092	.0125	.0159	.0189	.0250
						RPM	4300	3800	2800	2200	1850	1400
						IPM(FEED)	100	140	140	140	140	140
	39.1		56-60	0.5D	0.1R	SFM(Vc)	90	115	115	115	115	115
						IPT(fz)	.0040	.0074	.0100	.0125	.0150	.0199
						RPM	2700	2350	1750	1400	1170	880
						IPM(FEED)	43	70	70	70	70	70
	39.2		61-65	0.5D	0.1R	SFM(Vc)	60	80	80	80	80	80
						IPT(fz)	.0032	.0045	.0060	.0075	.0089	.0119
						RPM	1800	1650	1250	1000	840	630
						IPM(FEED)	23	30	30	30	30	30
	40	Chilled Cast Iron	42	0.5D	0.2R	SFM(Vc)	215	250	255	255	255	255
						IPT(fz)	.0060	.0098	.0128	.0161	.0192	.0256
						RPM	6500	5100	3900	3100	2600	1950
						IPM(FEED)	155	200	200	200	200	200
	41	Hardened Cast Iron	55	0.5D	0.1R	SFM(Vc)	140	185	185	180	180	185
						IPT(fz)	.0058	.0092	.0125	.0159	.0189	.0250
						RPM	4300	3800	2800	2200	1850	1400
						IPM(FEED)	100	140	140	140	140	140

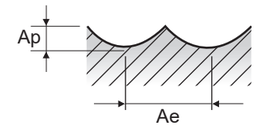


X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G8A43 SERIES — 2 FLUTE BALL NOSE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2
P	5	Non-alloy steel	32	0.05D	0.02D	SFM(Vc)	410	815	1220	1085	915	910	910	915	910
						IPT(fz)	.0019	.0023	.0023	.0036	.0061	.0069	.0074	.0078	.0083
						RPM	50000	49700	49700	33100	18600	13900	11100	9300	6950
						IPM(FEED)	189	224	224	236	228	191	165	146	116
	8-9	Low alloy steel	32-38	0.05D	0.02D	SFM(Vc)	410	815	1220	1085	915	910	910	915	910
						IPT(fz)	.0019	.0023	.0023	.0036	.0061	.0069	.0074	.0078	.0083
						RPM	50000	49700	49700	33100	18600	13900	11100	9300	6950
						IPM(FEED)	189	224	224	236	228	191	165	146	116
	11.1	High alloyed steel, and tool steel	35	0.05D	0.02D	SFM(Vc)	410	815	1220	1085	915	910	910	915	910
						IPT(fz)	.0019	.0023	.0023	.0036	.0061	.0069	.0074	.0078	.0083
						RPM	50000	49700	49700	33100	18600	13900	11100	9300	6950
						IPM(FEED)	189	224	224	236	228	191	165	146	116
	11.2		44	0.05D	0.02D	SFM(Vc)	410	780	1175	1040	875	875	875	875	875
						IPT(fz)	.0017	.0020	.0020	.0033	.0054	.0060	.0064	.0069	.0073
						RPM	50000	47800	47800	31800	17800	13400	10700	8900	6680
						IPM(FEED)	165	189	189	209	193	161	138	122	98
H	38.1	Hardened steel	45-49	0.05D	0.02D	SFM(Vc)	410	780	1175	1040	875	875	875	875	875
						IPT(fz)	.0017	.0020	.0020	.0033	.0054	.0060	.0064	.0069	.0073
						RPM	50000	47800	47800	31800	17800	13400	10700	8900	6680
						IPM(FEED)	165	189	189	209	193	161	138	122	98
	38.2		50-55	0.05D	0.02D	SFM(Vc)	370	655	980	865	735	720	735	735	735
						IPT(fz)	.0017	.0020	.0020	.0030	.0049	.0055	.0059	.0063	.0067
						RPM	45000	40000	40000	26500	15000	11000	9000	7500	5600
						IPM(FEED)	150	158	158	158	148	122	106	95	75
	39.1		56-60	0.05D	0.02D	SFM(Vc)	325	575	860	770	665	655	655	650	655
						IPT(fz)	.0015	.0018	.0018	.0026	.0044	.0049	.0053	.0057	.0061
						RPM	40000	35000	35000	23500	13500	10000	8000	6600	5000
						IPM(FEED)	118	124	124	124	120	98	85	75	61
	39.2		61-65	0.05D	0.02D	SFM(Vc)	285	525	785	685	565	575	575	570	575
						IPT(fz)	.0015	.0017	.0017	.0026	.0043	.0048	.0052	.0056	.0056
						RPM	35000	32000	32000	21000	11500	8800	7000	5800	4400
						IPM(FEED)	102	110	110	110	100	85	73	65	49
	39.3		66-70	0.05D	0.02D	SFM(Vc)	285	465	700	620	515	525	530	520	525
						IPT(fz)	.0013	.0016	.0016	.0024	.0040	.0043	.0047	.0051	.0051
						RPM	35000	28500	28500	19000	10500	8000	6500	5300	4000
						IPM(FEED)	91	91	91	91	83	69	61	54	41
	40	Chilled Cast Iron	42	0.05D	0.02D	SFM(Vc)	410	780	1175	1040	875	875	875	875	875
						IPT(fz)	.0017	.0020	.0020	.0033	.0054	.0060	.0064	.0069	.0073
						RPM	50000	47800	47800	31800	17800	13400	10700	8900	6680
						IPM(FEED)	165	189	189	209	193	161	138	122	98
	41	Hardened Cast Iron	55	0.05D	0.02D	SFM(Vc)	370	655	980	865	735	720	735	735	735
						IPT(fz)	.0017	.0020	.0020	.0030	.0049	.0055	.0059	.0063	.0067
						RPM	45000	40000	40000	26500	15000	11000	9000	7500	5600
						IPM(FEED)	150	158	158	158	148	122	106	95	75

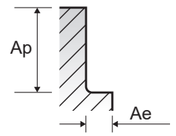


X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G850 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4
P	5	Non-alloy steel	32	0.03D	1.0D	SFM(Vc)	685	675	810	810	815	805	825	810	805
						IPT(fz)	.0004	.0006	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	41950	20600	16500	12400	9950	8200	6300	4950	4100
						IPM(FEED)	69	52	66	58	60	58	52	48	43
	8-9	Low alloy steel	32-38	0.03D	1.0D	SFM(Vc)	685	675	810	810	815	805	825	810	805
						IPT(fz)	.0004	.0006	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	41950	20600	16500	12400	9950	8200	6300	4950	4100
						IPM(FEED)	69	52	66	58	60	58	52	48	43
	11.1	High alloyed steel, and tool steel	35	0.03D	1.0D	SFM(Vc)	685	675	810	810	815	805	825	810	805
						IPT(fz)	.0004	.0006	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	41950	20600	16500	12400	9950	8200	6300	4950	4100
						IPM(FEED)	69	52	66	58	60	58	52	48	43
	11.2		44	0.03D	1.0D	SFM(Vc)	535	535	645	640	640	635	650	645	640
						IPT(fz)	.0004	.0006	.0010	.0011	.0014	.0016	.0019	.0022	.0025
						RPM	32750	16350	13100	9800	7850	6450	4950	3950	3250
						IPM(FEED)	50	37	50	42	43	42	37	35	32
H	38.1	Hardened steel	45-49	0.03D	1.0D	SFM(Vc)	535	535	645	640	640	635	650	645	640
						IPT(fz)	.0004	.0006	.0010	.0011	.0014	.0016	.0019	.0022	.0025
						RPM	32750	16350	13100	9800	7850	6450	4950	3950	3250
						IPM(FEED)	50	37	50	42	43	42	37	35	32
	38.2		50-55	0.03D	1.0D	SFM(Vc)	360	355	425	425	430	420	430	425	420
						IPT(fz)	.0004	.0006	.0009	.0011	.0014	.0016	.0019	.0022	.0026
						RPM	22050	10850	8700	6500	5250	4300	3300	2600	2150
						IPM(FEED)	33	25	33	28	29	28	25	23	22
	39.1		56-60	0.03D	1.0D	SFM(Vc)	300	295	330	325	330	330	325	325	335
						IPT(fz)	.0003	.0004	.0007	.0009	.0010	.0012	.0014	.0016	.0019
						RPM	18250	9000	6700	5000	4050	3350	2500	2000	1700
						IPM(FEED)	21	16	19	17	17	16	14	13	13
	39.2		61-65	0.03D	1.0D	SFM(Vc)	225	230	265	260	265	265	260	260	265
						IPT(fz)	.0002	.0004	.0006	.0006	.0008	.0009	.0011	.0014	.0015
						RPM	13850	7100	5350	3950	3250	2700	2000	1600	1350
						IPM(FEED)	13	10	12	10	11	10	9	9	8
	39.3		66-70	0.03D	1.0D	SFM(Vc)	195	200	230	230	230	225	230	230	225
						IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0008	.0010	.0011	.0013
						RPM	11950	6050	4650	3500	2800	2300	1750	1400	1150
						IPM(FEED)	9	7	9	8	8	7	7	6	6
	40	Chilled Cast Iron	42	0.03D	1.0D	SFM(Vc)	535	535	645	640	640	635	650	645	640
						IPT(fz)	.0004	.0006	.0010	.0011	.0014	.0016	.0019	.0022	.0025
						RPM	32750	16350	13100	9800	7850	6450	4950	3950	3250
						IPM(FEED)	50	37	50	42	43	42	37	35	32
	41	Hardened Cast Iron	55	0.03D	1.0D	SFM(Vc)	360	355	425	425	430	420	430	425	420
						IPT(fz)	.0004	.0006	.0009	.0011	.0014	.0016	.0019	.0022	.0026
						RPM	22050	10850	8700	6500	5250	4300	3300	2600	2150
						IPM(FEED)	33	25	33	28	29	28	25	23	22

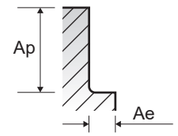


X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G851 SERIES — 6&8 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	5	Non-alloy steel	32	0.05D	1.0D	SFM(Vc)	395	395	395	395	395	395	395
						IPT(fz)	.0016	.0020	.0024	.0029	.0035	.0030	.0044
						RPM	6020	4810	4010	3010	2410	2010	1500
						IPM(FEED)	59	59	57	53	51	48	53
	8-9	Low alloy steel	32-38	0.05D	1.0D	SFM(Vc)	395	395	395	395	395	395	395
						IPT(fz)	.0016	.0020	.0024	.0029	.0035	.0030	.0044
						RPM	6020	4810	4010	3010	2410	2010	1500
						IPM(FEED)	59	59	57	53	51	48	53
	11.1	High alloyed steel, and tool steel	35	0.05D	1.0D	SFM(Vc)	395	395	395	395	395	395	395
						IPT(fz)	.0016	.0020	.0024	.0029	.0035	.0030	.0044
						RPM	6020	4810	4010	3010	2410	2010	1500
						IPM(FEED)	59	59	57	53	51	48	53
	11.2		44	0.05D	1.0D	SFM(Vc)	310	310	310	310	310	310	310
						IPT(fz)	.0015	.0018	.0021	.0026	.0031	.0034	.0038
						RPM	4760	3810	3170	2380	1900	1590	1190
						IPM(FEED)	42	41	39	37	35	43	37
H	38.1	Hardened steel	45-49	0.05D	1.0D	SFM(Vc)	310	310	310	310	310	310	310
						IPT(fz)	.0015	.0018	.0021	.0026	.0031	.0034	.0038
						RPM	4760	3810	3170	2380	1900	1590	1190
						IPM(FEED)	42	41	39	37	35	43	37
	38.2		50-55	0.05D	1.0D	SFM(Vc)	310	310	310	310	310	310	310
						IPT(fz)	.0015	.0018	.0021	.0026	.0031	.0034	.0038
						RPM	4760	3810	3170	2380	1900	1590	1190
						IPM(FEED)	42	41	39	37	35	43	37
	39.1		56-60	0.03D	1.0D	SFM(Vc)	230	230	230	230	230	230	230
						IPT(fz)	.0013	.0016	.0019	.0023	.0028	.0026	.0035
						RPM	3510	2810	2340	1750	1400	1170	880
						IPM(FEED)	27	28	26	25	24	24	24
	39.2		61-65	0.03D	1.0D	SFM(Vc)	230	230	230	230	230	230	230
						IPT(fz)	.0013	.0016	.0019	.0023	.0028	.0026	.0035
						RPM	3510	2810	2340	1750	1400	1170	880
						IPM(FEED)	27	28	26	25	24	24	24
	39.3		66-70	0.03D	1.0D	SFM(Vc)	165	165	165	165	165	165	165
						IPT(fz)	.0012	.0014	.0017	.0021	.0025	.0027	.0032
						RPM	2510	2010	1670	1250	1000	840	630
						IPM(FEED)	18	17	17	16	15	18	16
	40	Chilled Cast Iron	42	0.05D	1.0D	SFM(Vc)	310	310	310	310	310	310	310
						IPT(fz)	.0015	.0018	.0021	.0026	.0031	.0034	.0038
						RPM	4760	3810	3170	2380	1900	1590	1190
						IPM(FEED)	42	41	39	37	35	43	37
	41	Hardened Cast Iron	55	0.05D	1.0D	SFM(Vc)	310	310	310	310	310	310	310
						IPT(fz)	.0015	.0018	.0021	.0026	.0031	.0034	.0038
						RPM	4760	3810	3170	2380	1900	1590	1190
						IPM(FEED)	42	41	39	37	35	43	37



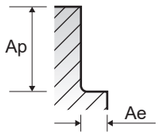
YG X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G859, G854 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

(HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 2	3	4	5	6	8	10	12	16
P	5	Non-alloy steel	32	0.3D	0.1R	SFM(Vc)	600	680	700	775	835	825	825	815	825
						IPT(fz)	.0051	.0072	.0101	.0118	.0135	.0182	.0228	.0276	.0364
						RPM	29000	22000	17000	15000	13500	10000	8000	6600	5000
						IPM(FEED)	591	630	689	709	728	728	728	728	728
	8-9	Low alloy steel	32-38	0.3D	0.1R	SFM(Vc)	600	680	700	775	835	825	825	815	825
						IPT(fz)	.0051	.0072	.0101	.0118	.0135	.0182	.0228	.0276	.0364
						RPM	29000	22000	17000	15000	13500	10000	8000	6600	5000
						IPM(FEED)	591	630	689	709	728	728	728	728	728
	11.1	High alloyed steel, and tool steel	35	0.3D	0.1R	SFM(Vc)	600	680	700	775	835	825	825	815	825
						IPT(fz)	.0051	.0072	.0101	.0118	.0135	.0182	.0228	.0276	.0364
						RPM	29000	22000	17000	15000	13500	10000	8000	6600	5000
						IPM(FEED)	591	630	689	709	728	728	728	728	728
	11.2		44	0.3D	0.1R	SFM(Vc)	455	525	535	565	650	660	660	655	645
						IPT(fz)	.0044	.0058	.0091	.0044	.0129	.0172	.0215	.0260	.0353
						RPM	22000	17000	13000	11000	10500	8000	6400	5300	3900
						IPM(FEED)	386	394	472	192	543	551	551	551	551
H	38.1	Hardened steel	45-49	0.3D	0.1R	SFM(Vc)	455	525	535	565	650	660	660	655	645
						IPT(fz)	.0044	.0058	.0091	.0044	.0129	.0172	.0215	.0260	.0353
						RPM	22000	17000	13000	11000	10500	8000	6400	5300	3900
						IPM(FEED)	386	394	472	192	543	551	551	551	551
	38.2		50-55	0.3D	0.1R	SFM(Vc)	310	385	455	515	555	560	555	555	545
						IPT(fz)	.0052	.0063	.0082	.0099	.0120	.0159	.0200	.0241	.0328
						RPM	15000	12500	11000	10000	9000	6800	5400	4500	3300
						IPM(FEED)	309	315	362	394	433	433	433	433	433
	39.1		56-60	0.3D	0.05R	SFM(Vc)	225	295	330	360	395	395	390	395	395
						IPT(fz)	.0040	.0048	.0068	.0084	.0098	.0138	.0176	.0216	.0288
						RPM	11000	9500	8000	7000	6400	4800	3800	3200	2400
						IPM(FEED)	175	181	217	236	252	264	268	276	276
	39.2		61-65	0.3D	0.05R	SFM(Vc)	180	215	230	255	280	280	280	280	270
						IPT(fz)	.0028	.0036	.0051	.0062	.0079	.0118	.0139	.0158	.0197
						RPM	8700	6900	5600	4900	4500	3400	2700	2250	1650
						IPM(FEED)	97	98	114	122	142	161	150	142	130
	40	Chilled Cast Iron	42	0.3D	0.1R	SFM(Vc)	455	525	535	565	650	660	660	655	645
						IPT(fz)	.0044	.0058	.0091	.0044	.0129	.0172	.0215	.0260	.0353
						RPM	22000	17000	13000	11000	10500	8000	6400	5300	3900
						IPM(FEED)	386	394	472	192	543	551	551	551	551
	41	Hardened Cast Iron	55	0.3D	0.1R	SFM(Vc)	310	385	455	515	555	560	555	555	545
						IPT(fz)	.0052	.0063	.0082	.0099	.0120	.0159	.0200	.0241	.0328
						RPM	15000	12500	11000	10000	9000	6800	5400	4500	3300
						IPM(FEED)	309	315	362	394	433	433	433	433	433

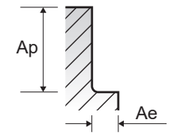


YG X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS
G859, G854 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

(NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 2	3	4	5	6	8	10	12	16
P	5	Non-alloy steel	32	0.5D	0.2R	SFM(Vc)	280	295	330	335	360	360	360	360	365
						IPT(fz)	.0047	.0067	.0087	.0110	.0130	.0173	.0215	.0259	.0342
						RPM	13500	9550	7950	6500	5800	4350	3500	2900	2200
						IPM(FEED)	256	256	276	287	301	301	301	301	301
	8-9	Low alloy steel	32-38	0.5D	0.2R	SFM(Vc)	280	295	330	335	360	360	360	360	365
						IPT(fz)	.0047	.0067	.0087	.0110	.0130	.0173	.0215	.0259	.0342
						RPM	13500	9550	7950	6500	5800	4350	3500	2900	2200
						IPM(FEED)	256	256	276	287	301	301	301	301	301
	11.1	High alloyed steel, and tool steel	35	0.5D	0.2R	SFM(Vc)	280	295	330	335	360	360	360	360	365
						IPT(fz)	.0047	.0067	.0087	.0110	.0130	.0173	.0215	.0259	.0342
						RPM	13500	9550	7950	6500	5800	4350	3500	2900	2200
						IPM(FEED)	256	256	276	287	301	301	301	301	301
	11.2		44	0.5D	0.2R	SFM(Vc)	195	215	235	245	255	250	255	255	255
						IPT(fz)	.0039	.0059	.0079	.0098	.0118	.0158	.0197	.0235	.0311
						RPM	9550	6900	5750	4800	4100	3050	2450	2050	1550
						IPM(FEED)	150	163	181	189	193	193	193	193	193
H	38.1	Hardened steel	45-49	0.5D	0.2R	SFM(Vc)	195	215	235	245	255	250	255	255	255
						IPT(fz)	.0039	.0059	.0079	.0098	.0118	.0158	.0197	.0235	.0311
						RPM	9550	6900	5750	4800	4100	3050	2450	2050	1550
						IPM(FEED)	150	163	181	189	193	193	193	193	193
	38.2		50-55	0.5D	0.2R	SFM(Vc)	115	140	165	175	180	180	180	180	180
						IPT(fz)	.0040	.0059	.0079	.0093	.0119	.0157	.0197	.0238	.0314
						RPM	5500	4550	4000	3400	2900	2200	1750	1450	1100
						IPM(FEED)	87	108	126	126	138	138	138	138	138
	39.1		56-60	0.5D	0.1R	SFM(Vc)	65	90	105	115	115	115	115	115	115
						IPT(fz)	.0030	.0039	.0052	.0072	.0099	.0130	.0166	.0197	.0261
						RPM	3200	2850	2550	2200	1850	1400	1100	925	700
						IPM(FEED)	39	45	53	63	73	73	73	73	73
	39.2		61-65	0.5D	0.1R	SFM(Vc)	45	60	70	75	85	80	80	80	80
						IPT(fz)	.0025	.0032	.0040	.0047	.0057	.0078	.0097	.0117	.0155
						RPM	2200	1900	1750	1500	1350	995	795	665	500
						IPM(FEED)	22	24	28	28	31	31	31	31	31
	40	Chilled Cast Iron	42	0.5D	0.2R	SFM(Vc)	195	215	235	245	255	250	255	255	255
						IPT(fz)	.0039	.0059	.0079	.0098	.0118	.0158	.0197	.0235	.0311
						RPM	9550	6900	5750	4800	4100	3050	2450	2050	1550
						IPM(FEED)	150	163	181	189	193	193	193	193	193
	41	Hardened Cast Iron	55	0.5D	0.2R	SFM(Vc)	115	140	165	175	180	180	180	180	180
						IPT(fz)	.0040	.0059	.0079	.0093	.0119	.0157	.0197	.0238	.0314
						RPM	5500	4550	4000	3400	2900	2200	1750	1450	1100
						IPM(FEED)	87	108	126	126	138	138	138	138	138



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

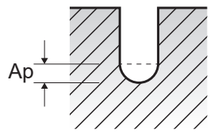
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS

G8A46, G8A54 SERIES — 2 FLUTE BALL NOSE - RIB PROCESSING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Parameter	Diameter (Ø) 0.2	0.3	0.4	0.5	0.6	0.8	1	1.2	1.5	2	3	4
P	5	Non-alloy steel	32	SFM(Vc)	105	150~155	200~205	175~255	175~250	180~255	180~250	175~230	170~220	175~225	175~255	175~255
				IPT(fz)	.0001	.0002	.0003	.0002~.0005	.0003~.0006	.0004~.0008	.0005~.0010	.0006~.0011	.0008~.0014	.0010~.0019	.0018~.0034	.0022~.0045
				RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700	22000~30800	17600~24200	14300~18700	11000~14300	8500~11000	5700~8200	4300~6200
				IPM(FEED)	12~14	19~21	28~31	24~34	23~34	25~35	24~34	23~31	23~30	23~32	29~39	27~39
				Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034	0.016~0.064	0.008~0.080	0.024~0.032	0.031~0.048	0.024~0.160	0.064~0.240	0.080~0.320
	8-9	Low alloy steel	32-38	SFM(Vc)	105	150~155	200~205	175~255	175~250	180~255	180~250	175~230	170~220	175~225	175~255	175~255
				IPT(fz)	.0001	.0002	.0003	.0002~.0005	.0003~.0006	.0004~.0008	.0005~.0010	.0006~.0011	.0008~.0014	.0010~.0019	.0018~.0034	.0022~.0045
				RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700	22000~30800	17600~24200	14300~18700	11000~14300	8500~11000	5700~8200	4300~6200
				IPM(FEED)	12~14	19~21	28~31	24~34	23~34	25~35	24~34	23~31	23~30	23~32	29~39	27~39
				Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034	0.016~0.064	0.008~0.080	0.024~0.032	0.031~0.048	0.024~0.160	0.064~0.240	0.080~0.320
	11.1	High alloyed steel, and tool steel	35	SFM(Vc)	105	150~155	200~205	175~255	175~250	180~255	180~250	175~230	170~220	175~225	175~255	175~255
				IPT(fz)	.0001	.0002	.0003	.0002~.0005	.0003~.0006	.0004~.0008	.0005~.0010	.0006~.0011	.0008~.0014	.0010~.0019	.0018~.0034	.0022~.0045
				RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700	22000~30800	17600~24200	14300~18700	11000~14300	8500~11000	5700~8200	4300~6200
				IPM(FEED)	12~14	19~21	28~31	24~34	23~34	25~35	24~34	23~31	23~30	23~32	29~39	27~39
				Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034	0.016~0.064	0.008~0.080	0.024~0.032	0.031~0.048	0.024~0.160	0.064~0.240	0.080~0.320
	11.2		44	SFM(Vc)	105	150~155	200~205	175~255	175~250	180~255	180~250	175~230	170~220	175~225	175~255	175~255
				IPT(fz)	.0001	.0002	.0003	.0002~.0005	.0003~.0006	.0004~.0008	.0005~.0010	.0006~.0011	.0008~.0014	.0010~.0019	.0018~.0034	.0022~.0045
				RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700	22000~30800	17600~24200	14300~18700	11000~14300	8500~11000	5700~8200	4300~6200
				IPM(FEED)	12~14	19~21	28~31	24~34	23~34	25~35	24~34	23~31	23~30	23~32	29~39	27~39
				Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034	0.016~0.064	0.008~0.080	0.024~0.032	0.031~0.048	0.024~0.160	0.064~0.240	0.080~0.320
H	38.1 - 38.2	Hardened steel	45-49 50-55	SFM(Vc)	105	150~155	200~205	165~180	165~185	165~180	160~180	150~175	155~180	165~180	165~180	165~180
				IPT(fz)	.0001	.0002	.0002	.0003	.0003~.0004	.0004~.0006	.0005~.0007	.0007~.0009	.0008~.0011	.0011~.0013	.0020~.0025	.0025~.0030
				RPM	50000	48000~50000	48000~50000	31900~35200	26400~29700	19800~22000	15400~17600	12000~14000	10000~11500	7900~8800	5300~5800	3950~4400
				IPM(FEED)	10~12	17~18	18~22	19~21	19~21	19~22	19~21	19~21	19~21	19~21	23~26	22~24
				Ap	0.005~0.013	0.008~0.014	0.011~0.026	0.005~0.023	0.006~0.028	0.013~0.052	0.007~0.065	0.020~0.026	0.025~0.039	0.020~0.130	0.052~0.195	0.065~0.026
	39.1 - 39.2		56-60 61-65	SFM(Vc)	105	140~155	190~205	165~180	165~185	165~180	160~180	150~175	155~180	165~180	165~180	160~180
				IPT(fz)	.0001	.0002	.0002	.0002~.0003	.0003~.0004	.0004~.0005	.0005~.0006	.0006~.0008	.0007~.0010	.0010~.0012	.0019~.0023	.0024~.0029
				RPM	50000	46000~50000	46000~50000	31900~35200	26400~29700	19800~22000	15400~17600	12000~14000	10000~11500	7900~8800	5300~5800	3850~4400
				IPM(FEED)	9~10	15~17	16~18	17~19	16~19	17~20	17~20	17~19	17~19	17~19	22~24	21~22
				Ap	0.005~0.012	0.007~0.013	0.010~0.024	0.005~0.021	0.006~0.025	0.012~0.048	0.006~0.060	0.018~0.024	0.023~0.036	0.018~0.120	0.048~0.120	0.060~0.240
	40	Chilled Cast Iron	42	SFM(Vc)	105	150~155	200~205	175~255	175~250	180~255	180~250	175~230	170~220	175~225	175~255	175~255
				IPT(fz)	.0001	.0002	.0003	.0002~.0005	.0003~.0006	.0004~.0008	.0005~.0010	.0006~.0011	.0008~.0014	.0010~.0019	.0018~.0034	.0022~.0045
				RPM	50000	48000~50000	48000~50000	34100~49500	28600~40700	22000~30800	17600~24200	14300~18700	11000~14300	8500~11000	5700~8200	4300~6200
				IPM(FEED)	12~14	19~21	28~31	24~34	23~34	25~35	24~34	23~31	23~30	23~32	29~39	27~39
				Ap	0.006~0.016	0.010~0.017	0.013~0.032	0.007~0.028	0.007~0.034	0.016~0.064	0.008~0.080	0.024~0.032	0.031~0.048	0.024~0.160	0.064~0.240	0.080~0.320
	41	Hardened Cast Iron	55	SFM(Vc)	105	150~155	200~205	165~180	165~185	165~180	160~180	150~175	155~180	165~180	165~180	165~180
				IPT(fz)	.0001	.0002	.0002	.0003	.0003~.0004	.0004~.0006	.0005~.0007	.0007~.0009	.0008~.0011	.0011~.0013	.0020~.0025	.0025~.0030
				RPM	50000	48000~50000	48000~50000	31900~35200	26400~29700	19800~22000	15400~17600	12000~14000	10000~11500	7900~8800	5300~5800	3950~4400
				IPM(FEED)	10~12	17~18	18~22	19~21	19~21	19~22	19~21	19~21	19~21	19~21	23~26	22~24
				Ap	0.005~0.013	0.008~0.014	0.011~0.026	0.005~0.023	0.006~0.028	0.013~0.052	0.007~0.065	0.020~0.026	0.025~0.039	0.020~0.130	0.052~0.195	0.065~0.026



X5070 END MILLS
RECOMMENDED CUTTING CONDITIONS

G8A28, G8A38, G8A53 SERIES — 2 FLUTE BALL NOSE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 0.2	0.3	0.4	0.5	0.6	0.8	1	1.2	1.5	2
P	5	Non-alloy steel	32	0.05D	0.02D	SFM(Vc)	105	155	205	260	310	410	515	620	775	1025
						IPT(fz)	.0005	.0006	.0008	.0010	.0011	.0015	.0019	.0020	.0021	.0023
						RPM	50000	50000	50000	50000	50000	50000	50000	50000	50000	49700
						IPM(FEED)	47	59	75	95	114	154	189	201	213	224
	8-9	Low alloy steel	32-38	0.05D	0.02D	SFM(Vc)	105	155	205	260	310	410	515	620	775	1025
						IPT(fz)	.0005	.0006	.0008	.0010	.0011	.0015	.0019	.0020	.0021	.0023
						RPM	50000	50000	50000	50000	50000	50000	50000	50000	50000	49700
						IPM(FEED)	47	59	75	95	114	154	189	201	213	224
	11.1	High alloyed steel, and tool steel	35	0.05D	0.02D	SFM(Vc)	105	155	205	260	310	410	515	620	775	1025
						IPT(fz)	.0005	.0006	.0008	.0010	.0011	.0015	.0019	.0020	.0021	.0023
						RPM	50000	50000	50000	50000	50000	50000	50000	50000	50000	49700
						IPM(FEED)	47	59	75	95	114	154	189	201	213	224
	11.2		44	0.05D	0.02D	SFM(Vc)	105	155	205	260	310	410	515	595	740	985
						IPT(fz)	.0004	.0005	.0007	.0008	.0010	.0013	.0017	.0018	.0018	.0020
						RPM	50000	50000	50000	50000	50000	50000	50000	48000	48000	47800
						IPM(FEED)	41	54	67	83	98	130	165	169	177	189
H	38.1	Hardened steel	45-49	0.05D	0.02D	SFM(Vc)	105	155	205	260	310	410	515	595	740	985
						IPT(fz)	.0004	.0005	.0007	.0008	.0010	.0013	.0017	.0018	.0018	.0020
						RPM	50000	50000	50000	50000	50000	50000	50000	48000	48000	47800
						IPM(FEED)	41	54	67	83	98	130	165	169	177	189
	38.2		50-55	0.05D	0.02D	SFM(Vc)	95	140	185	230	280	370	465	530	665	825
						IPT(fz)	.0004	.0005	.0007	.0008	.0010	.0013	.0017	.0018	.0018	.0020
						RPM	45000	45000	45000	45000	45000	45000	45000	43000	43000	40000
						IPM(FEED)	38	47	59	75	87	118	150	152	158	158
	39.1		56-60	0.05D	0.02D	SFM(Vc)	80	125	165	205	245	330	410	470	570	720
						IPT(fz)	.0004	.0005	.0006	.0007	.0009	.0012	.0015	.0016	.0016	.0018
						RPM	40000	40000	40000	40000	40000	40000	40000	38000	37000	35000
						IPM(FEED)	30	38	47	59	71	95	118	118	122	124
	39.2		61-65	0.05D	0.02D	SFM(Vc)	70	110	145	180	215	290	360	420	510	660
						IPT(fz)	.0004	.0005	.0006	.0007	.0009	.0012	.0015	.0016	.0016	.0017
						RPM	35000	35000	35000	35000	35000	35000	35000	34000	33000	32000
						IPM(FEED)	27	33	41	51	63	83	102	106	106	110
	39.3		66-70	0.05D	0.02D	SFM(Vc)	65	95	130	160	195	260	360	380	460	585
						IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0011	.0013	.0015	.0015	.0016
						RPM	31500	31500	31500	31500	31500	31500	35000	30600	29700	28500
						IPM(FEED)	22	28	35	43	55	71	91	91	91	91
	40	Chilled Cast Iron	42	0.05D	0.02D	SFM(Vc)	105	155	205	260	310	410	515	595	740	985
						IPT(fz)	.0004	.0005	.0007	.0008	.0010	.0013	.0017	.0018	.0018	.0020
						RPM	50000	50000	50000	50000	50000	50000	50000	48000	48000	47800
						IPM(FEED)	41	54	67	83	98	130	165	169	177	189
	41	Hardened Cast Iron	55	0.05D	0.02D	SFM(Vc)	95	140	185	230	280	370	465	530	665	825
						IPT(fz)	.0004	.0005	.0007	.0008	.0010	.0013	.0017	.0018	.0018	.0020
						RPM	45000	45000	45000	45000	45000	45000	45000	43000	43000	40000
						IPM(FEED)	38	47	59	75	87	118	150	152	158	158

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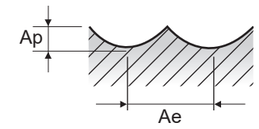


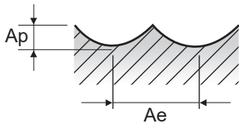
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS

G8A28, G8A38, G8A53 SERIES — 2 FLUTE BALL NOSE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	0.05D	0.02D	SFM(Vc)	1025	1025	960	860	915	960	860	920	915
						IPT(fz)	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0093	.0104
						RPM	33100	24900	18600	13900	11100	9300	6950	5570	4450
						IPM(FEED)	236	236	228	191	165	146	116	104	93
	8-9	Low alloy steel	32-38	0.05D	0.02D	SFM(Vc)	1025	1025	960	860	915	960	860	920	915
						IPT(fz)	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0093	.0104
						RPM	33100	24900	18600	13900	11100	9300	6950	5570	4450
						IPM(FEED)	236	236	228	191	165	146	116	104	93
	11.1	High alloyed steel, and tool steel	35	0.05D	0.02D	SFM(Vc)	1025	1025	960	860	915	960	860	920	915
						IPT(fz)	.0036	.0047	.0061	.0069	.0074	.0078	.0083	.0093	.0104
						RPM	33100	24900	18600	13900	11100	9300	6950	5570	4450
						IPM(FEED)	236	236	228	191	165	146	116	104	93
	11.2		44	0.05D	0.02D	SFM(Vc)	985	985	915	830	880	915	825	880	885
						IPT(fz)	.0033	.0044	.0054	.0060	.0064	.0069	.0073	.0081	.0090
						RPM	31800	23900	17800	13400	10700	8900	6680	5350	4300
						IPM(FEED)	209	209	193	161	138	122	98	87	77
H	38.1	Hardened steel	45-49	0.05D	0.02D	SFM(Vc)	985	985	915	830	880	915	825	880	885
						IPT(fz)	.0033	.0044	.0054	.0060	.0064	.0069	.0073	.0081	.0090
						RPM	31800	23900	17800	13400	10700	8900	6680	5350	4300
						IPM(FEED)	209	209	193	161	138	122	98	87	77
	38.2		50-55	0.05D	0.02D	SFM(Vc)	820	825	775	680	740	775	695	740	740
						IPT(fz)	.0030	.0040	.0049	.0055	.0059	.0063	.0067	.0074	.0082
						RPM	26500	20000	15000	11000	9000	7500	5600	4500	3600
						IPM(FEED)	158	158	148	122	106	95	75	67	59
	39.1		56-60	0.05D	0.02D	SFM(Vc)	725	720	695	620	660	680	620	660	660
						IPT(fz)	.0026	.0035	.0044	.0049	.0053	.0057	.0061	.0066	.0073
						RPM	23500	17500	13500	10000	8000	6600	5000	4000	3200
						IPM(FEED)	124	124	120	98	85	75	61	53	47
	39.2		61-65	0.05D	0.02D	SFM(Vc)	650	660	595	545	575	600	545	575	575
						IPT(fz)	.0026	.0034	.0043	.0048	.0052	.0056	.0056	.0056	.0057
						RPM	21000	16000	11500	8800	7000	5800	4400	3500	2800
						IPM(FEED)	110	110	100	85	73	65	49	39	32
	39.3		66-70	0.05D	0.02D	SFM(Vc)	585	600	540	495	535	545	495	530	525
						IPT(fz)	.0024	.0031	.0040	.0043	.0047	.0051	.0051	.0053	.0051
						RPM	19000	14500	10500	8000	6500	5300	4000	3200	2550
						IPM(FEED)	91	91	83	69	61	54	41	34	26
	40	Chilled Cast Iron	42	0.05D	0.02D	SFM(Vc)	985	985	915	830	880	915	825	880	885
						IPT(fz)	.0033	.0044	.0054	.0060	.0064	.0069	.0073	.0081	.0090
						RPM	31800	23900	17800	13400	10700	8900	6680	5350	4300
						IPM(FEED)	209	209	193	161	138	122	98	87	77
	41	Hardened Cast Iron	55	0.05D	0.02D	SFM(Vc)	820	825	775	680	740	775	695	740	740
						IPT(fz)	.0030	.0040	.0049	.0055	.0059	.0063	.0067	.0074	.0082
						RPM	26500	20000	15000	11000	9000	7500	5600	4500	3600
						IPM(FEED)	158	158	148	122	106	95	75	67	59



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

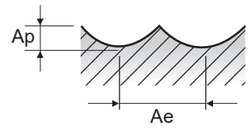
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS

G8A59 SERIES — 3 FLUTE BALL NOSE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	0.05D	0.02D	SFM(Vc)	990	995	1030	1115	1115	1115	1120	1105	1115
						IPT(fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088
						RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400
						IPM(FEED)	339	303	285	337	289	257	240	181	142
	8-9	Low alloy steel	32-38	0.05D	0.02D	SFM(Vc)	990	995	1030	1115	1115	1115	1120	1105	1115
						IPT(fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088
						RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400
						IPM(FEED)	339	303	285	337	289	257	240	181	142
	11.1 - 11.2	High alloyed steel, and tool steel	35-44	0.05D	0.02D	SFM(Vc)	990	995	1030	1115	1115	1115	1120	1105	1115
						IPT(fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088
						RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400
						IPM(FEED)	339	303	285	337	289	257	240	181	142
H	38.1 - 38.2	Hardened steel	45-49 50-55	0.05D	0.02D	SFM(Vc)	830	830	865	940	930	940	940	940	940
						IPT(fz)	.0028	.0035	.0043	.0054	.0061	.0066	.0074	.0075	.0075
						RPM	26840	20130	16780	15200	11300	9100	7590	5690	4550
						IPM(FEED)	228	214	214	245	207	181	168	128	103
	39.1		56-60	0.05D	0.02D	SFM(Vc)	615	615	640	755	760	760	760	760	755
						IPT(fz)	.0028	.0034	.0039	.0048	.0057	.0062	.0069	.0071	.0071
						RPM	19840	14880	12400	12200	9200	7350	6130	4600	3670
						IPM(FEED)	169	153	145	177	157	136	126	98	78
	39.2		61-65	0.05D	0.02D	SFM(Vc)	580	585	600	685	685	685	685	685	680
						IPT(fz)	.0028	.0034	.0039	.0045	.0053	.0057	.0057	.0057	.0058
						RPM	18680	14220	11670	11100	8320	6660	5530	4160	3300
						IPM(FEED)	159	144	137	151	132	113	95	71	57
	39.3		66-70	0.05D	0.02D	SFM(Vc)	395	395	410	470	470	470	470	470	470
						IPT(fz)	.0028	.0034	.0039	.0043	.0049	.0056	.0057	.0056	.0057
						RPM	12780	9580	8000	7590	5690	4550	3800	2850	2280
						IPM(FEED)	109	98	93	97	84	77	65	48	39
	40	Chilled Cast Iron	42	0.05D	0.02D	SFM(Vc)	990	995	1030	1115	1115	1115	1120	1105	1115
						IPT(fz)	.0035	.0042	.0048	.0062	.0071	.0079	.0088	.0090	.0088
						RPM	32000	24080	20000	18000	13500	10800	9050	6700	5400
						IPM(FEED)	339	303	285	337	289	257	240	181	142
	41	Hardened Cast Iron	55	0.05D	0.02D	SFM(Vc)	830	830	865	940	930	940	940	940	940
						IPT(fz)	.0028	.0035	.0043	.0054	.0061	.0066	.0074	.0075	.0075
						RPM	26840	20130	16780	15200	11300	9100	7590	5690	4550
						IPM(FEED)	228	214	214	245	207	181	168	128	103



X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G8A36 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 0.2	0.3	0.4	0.5	0.6	0.8	0.9	1	2
P	5	Non-alloy steel	32	1.0D	0.05D	SFM(Vc)	105	155	205	260	310	410	455	495	685
						IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0005
						RPM	50000	50000	50000	50000	50000	50000	49000	48000	33300
						IPM(FEED)	5	8	9	15	19	24	26	30	34
	8-9	Low alloy steel	32-38	1.0D	0.05D	SFM(Vc)	105	155	205	260	310	410	455	495	685
						IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0005
						RPM	50000	50000	50000	50000	50000	50000	49000	48000	33300
						IPM(FEED)	5	8	9	15	19	24	26	30	34
	11.1	High alloyed steel, and tool steel	35	1.0D	0.05D	SFM(Vc)	105	155	205	260	310	410	455	495	685
						IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0005
						RPM	50000	50000	50000	50000	50000	50000	49000	48000	33300
						IPM(FEED)	5	8	9	15	19	24	26	30	34
	11.2		44	1.0D	0.05D	SFM(Vc)	95	140	185	230	280	330	360	390	535
						IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0005
						RPM	45000	45000	45000	45000	45000	40000	39000	38000	2600
						IPM(FEED)	32	38	38	39		38	38	33	30
H	38.1	Hardened steel	45-49	1.0D	0.05D	SFM(Vc)	95	140	185	230	280	330	360	390	535
						IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0005
						RPM	45000	45000	45000	45000	45000	40000	39000	38000	26000
						IPM(FEED)	5	6	7	11	14	17	21	22	27
	38.2		50-55	1.0D	0.05D	SFM(Vc)	80	125	165	205	245	245	260	265	360
						IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0005
						RPM	40000	40000	40000	40000	40000	30000	27800	25500	17500
						IPM(FEED)	4	5	6	9	11	12	13	14	17
	39.1		56-60	1.0D	0.05D	SFM(Vc)	70	100	135	170	185	205	210	210	300
						IPT(fz)	.0000	.0000	.0001	.0001	.0001	.0001	.0002	.0002	.0003
						RPM	33000	33000	33000	33000	30000	25000	22700	20500	14500
						IPM(FEED)	2	3	4	6	6	7	8	9	10
	39.2		61-65	1.0D	0.05D	SFM(Vc)	70	75	105	130	155	155	160	165	225
						IPT(fz)	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0002	.0003
						RPM	33000	25000	25000	25000	25000	19000	17500	16000	11000
						IPM(FEED)	2	2	2	3	4	4	5	5	6
	39.3		66-70	1.0D	0.02D	SFM(Vc)	55	60	80	105	125	125	130	130	195
						IPT(fz)	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0003
						RPM	26400	20000	20000	20000	20000	15200	14000	12500	9500
						IPM(FEED)	1	1	2	2	3	3	4	3	5
	40	Chilled Cast Iron	42	1.0D	0.05D	SFM(Vc)	95	140	185	230	280	330	360	390	535
						IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0005
						RPM	45000	45000	45000	45000	45000	40000	39000	38000	26000
						IPM(FEED)	5	6	7	11	14	17	21	22	27
	41	Hardened Cast Iron	55	1.0D	0.05D	SFM(Vc)	80	125	165	205	245	245	260	265	360
						IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0005
						RPM	40000	40000	40000	40000	40000	30000	27800	25500	17500
						IPM(FEED)	4	5	6	9	11	12	13	14	17

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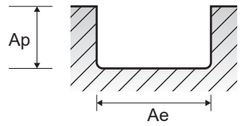
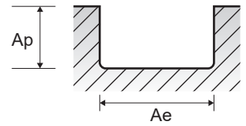


X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS
G8A36 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	1.0D	0.05D	SFM(Vc)	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0008	.0010	.0012	.0014	.0019	.0022	.0026	.0030	.0033
						RPM	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	34	35	39	37	37	34	34	29	26
	8-9	Low alloy steel	32-38	1.0D	0.05D	SFM(Vc)	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0008	.0010	.0012	.0014	.0019	.0022	.0026	.0030	.0033
						RPM	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	34	35	39	37	37	34	34	29	26
	11.1	High alloyed steel, and tool steel	35	1.0D	0.05D	SFM(Vc)	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0008	.0010	.0012	.0014	.0019	.0022	.0026	.0030	.0033
						RPM	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	34	35	39	37	37	34	34	29	26
	11.2		44	1.0D	0.05D	SFM(Vc)	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0008	.0011	.0013	.0014	.0018	.0022	.0026	.0029	.0034
						RPM	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	27	28	32	30	28	27	27	23	21
H	38.1	Hardened steel	45-49	1.0D	0.05D	SFM(Vc)	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0008	.0011	.0013	.0014	.0018	.0022	.0026	.0029	.0034
						RPM	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	27	28	32	30	28	27	27	23	21
	38.2		50-55	1.0D	0.05D	SFM(Vc)	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0007	.0010	.0012	.0014	.0017	.0020	.0023	.0027	.0034
						RPM	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	17	17	20	19	18	16	16	14	14
	39.1		56-60	1.0D	0.05D	SFM(Vc)	295	295	330	330	330	330	330	330	330
						IPT(fz)	.0005	.0008	.0009	.0010	.0013	.0016	.0019	.0020	.0025
						RPM	9500	7200	6400	5300	4000	3200	2650	2000	1600
						IPM(FEED)	10	11	11	11	10	10	10	8	8
	39.2		61-65	1.0D	0.05D	SFM(Vc)	230	230	265	260	265	265	260	265	270
						IPT(fz)	.0004	.0006	.0007	.0008	.0011	.0012	.0014	.0016	.0019
						RPM	7500	5600	5100	4200	3200	2550	2100	1600	1300
						IPM(FEED)	6	7	7	7	7	6	6	5	5
	39.3		66-70	1.0D	0.02D	SFM(Vc)	200	195	230	230	230	225	230	230	225
						IPT(fz)	.0004	.0005	.0006	.0007	.0009	.0009	.0011	.0014	.0014
						RPM	6400	4750	4450	3700	2800	2200	1860	1400	1100
						IPM(FEED)	5	5	5	5	5	4	4	4	3
	40	Chilled Cast Iron	42	1.0D	0.05D	SFM(Vc)	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0008	.0011	.0013	.0014	.0018	.0022	.0026	.0029	.0034
						RPM	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	27	28	32	30	28	27	27	23	21
	41	Hardened Cast Iron	55	1.0D	0.05D	SFM(Vc)	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0007	.0010	.0012	.0014	.0017	.0020	.0023	.0027	.0034
						RPM	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	17	17	20	19	18	16	16	14	14



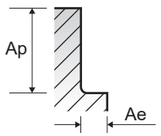
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G8A36 SERIES — 2 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1	2	3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0004	.0007	.0011	.0015	.0018	.0020	.0026	.0030	.0035	.0042	.0047
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	41	47	47	49	57	53	52	47	47	41	37
	8-9	Low alloy steel	32-38	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0004	.0007	.0011	.0015	.0018	.0020	.0026	.0030	.0035	.0042	.0047
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	41	47	47	49	57	53	52	47	47	41	37
	11.1	High alloyed steel, and tool steel	35	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0004	.0007	.0011	.0015	.0018	.0020	.0026	.0030	.0035	.0042	.0047
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	41	47	47	49	57	53	52	47	47	41	37
	11.2		44	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0004	.0007	.0011	.0015	.0018	.0021	.0026	.0031	.0036	.0042	.0048
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	32	38	38	39	45	43	41	38	38	33	30
H	38.1	Hardened steel	45-49	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0004	.0007	.0011	.0015	.0018	.0021	.0026	.0031	.0036	.0042	.0048
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	32	38	38	39	45	43	41	38	38	33	30
	38.2		50-55	0.03D	1.0D	SFM(Vc)	265	360	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0004	.0007	.0010	.0014	.0017	.0020	.0024	.0028	.0033	.0040	.0046
						RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	20	24	24	25	28	27	25	23	23	21	19
	39.1		56-60	0.03D	1.0D	SFM(Vc)	210	300	295	295	330	330	330	330	330	330	330
						IPT(fz)	.0003	.0005	.0008	.0010	.0013	.0015	.0018	.0020	.0025	.0030	.0034
						RPM	20500	14500	9500	7200	6400	5300	4000	3200	2650	2000	1600
						IPM(FEED)	12	15	15	15	16	16	14	13	13	12	11
	39.2		61-65	0.03D	1.0D	SFM(Vc)	165	225	230	230	265	260	265	265	260	265	270
						IPT(fz)	.0003	.0004	.0006	.0009	.0010	.0012	.0014	.0018	.0021	.0025	.0027
						RPM	16000	11000	7500	5600	5100	4200	3200	2550	2100	1600	1300
						IPM(FEED)	8	9	9	10	10	10	9	9	9	8	7
	39.3		66-70	0.03D	1.0D	SFM(Vc)	130	195	200	195	230	230	230	225	230	230	225
						IPT(fz)	.0002	.0004	.0005	.0007	.0009	.0009	.0013	.0014	.0016	.0021	.0018
						RPM	12500	9500	6400	4750	4450	3700	2800	2200	1860	1400	1100
						IPM(FEED)	5	7	7	7	8	7	7	6	6	6	4
	40	Chilled Cast Iron	42	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0004	.0007	.0011	.0015	.0018	.0021	.0026	.0031	.0036	.0042	.0048
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	32	38	38	39	45	43	41	38	38	33	30
	41	Hardened Cast Iron	55	0.03D	1.0D	SFM(Vc)	265	360	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0004	.0007	.0010	.0014	.0017	.0020	.0024	.0028	.0033	.0040	.0046
						RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	20	24	24	25	28	27	25	23	23	21	19

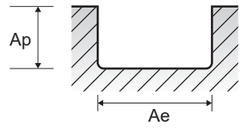


YG X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G8A50 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 0.3	0.4	0.5	0.6	0.8	1	1.2	1.5	2
P	5	Non-alloy steel	32	1.0D	0.05D	SFM(Vc)	155	205	260	310	410	495	520	570	685
						IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004	.0005
						RPM	50000	50000	50000	50000	50000	48000	42000	37000	33300
						IPM(FEED)	8	9	15	19	24	30	31	31	34
	8-9	Low alloy steel	32-38	1.0D	0.05D	SFM(Vc)	155	205	260	310	410	495	520	570	685
						IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004	.0005
						RPM	50000	50000	50000	50000	50000	48000	42000	37000	33300
						IPM(FEED)	8	9	15	19	24	30	31	31	34
	11.1	High alloyed steel, and tool steel	35	1.0D	0.05D	SFM(Vc)	155	205	260	310	410	495	520	570	685
						IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0003	.0004	.0004	.0005
						RPM	50000	50000	50000	50000	50000	48000	42000	37000	33300
						IPM(FEED)	8	9	15	19	24	30	31	31	34
	11.2		44	1.0D	0.05D	SFM(Vc)	140	185	230	280	330	390	420	470	535
						IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005
						RPM	45000	45000	45000	45000	40000	38000	34000	30500	26000
						IPM(FEED)	6	7	11	14	17	22	25	26	27
H	38.1	Hardened steel	45-49	1.0D	0.05D	SFM(Vc)	140	185	230	280	330	390	420	470	535
						IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005
						RPM	45000	45000	45000	45000	40000	38000	34000	30500	26000
						IPM(FEED)	6	7	11	14	17	22	25	26	27
	38.2		50-55	1.0D	0.05D	SFM(Vc)	125	165	205	245	245	265	280	325	360
						IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0003	.0003	.0004	.0005
						RPM	40000	40000	40000	40000	30000	25500	22500	21000	17500
						IPM(FEED)	5	6	9	11	12	14	15	16	17
	39.1		56-60	1.0D	0.02D	SFM(Vc)	100	135	170	185	205	210	245	265	300
						IPT(fz)	.0000	.0001	.0001	.0001	.0001	.0002	.0003	.0003	.0003
						RPM	33000	33000	33000	30000	25000	20500	20000	17000	14500
						IPM(FEED)	3	4	6	6	7	9	10	10	10
	39.2		61-65	1.0D	0.02D	SFM(Vc)	75	105	130	155	155	165	180	200	225
						IPT(fz)	.0000	.0000	.0001	.0001	.0001	.0002	.0002	.0002	.0003
						RPM	25000	25000	25000	25000	19000	16000	14500	13000	11000
						IPM(FEED)	2	2	3	4	4	5	6	6	6
	40	Chilled Cast Iron	42	1.0D	0.05D	SFM(Vc)	140	185	230	280	330	390	420	470	535
						IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0004	.0005
						RPM	45000	45000	45000	45000	40000	38000	34000	30500	26000
						IPM(FEED)	6	7	11	14	17	22	25	26	27
	41	Hardened Cast Iron	55	1.0D	0.05D	SFM(Vc)	125	165	205	245	245	265	280	325	360
						IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0003	.0003	.0004	.0005
						RPM	40000	40000	40000	40000	30000	25500	22500	21000	17500
						IPM(FEED)	5	6	9	11	12	14	15	16	17

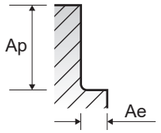


YG X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G8A47 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1	2	3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0002	.0004	.0006	.0009	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	47	55	55	57	63	61	59	55	55	47	41
	8-9	Low alloy steel	32-38	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0002	.0004	.0006	.0009	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	47	55	55	57	63	61	59	55	55	47	41
	11.1	High alloyed steel, and tool steel	35	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0002	.0004	.0006	.0009	.0010	.0012	.0015	.0018	.0021	.0024	.0026
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	47	55	55	57	63	61	59	55	55	47	41
	11.2		44	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0002	.0004	.0006	.0008	.0009	.0011	.0014	.0016	.0019	.0022	.0025
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	33	39	39	41	47	44	43	40	40	35	31
H	38.1	Hardened steel	45-49	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0002	.0004	.0006	.0008	.0009	.0011	.0014	.0016	.0019	.0022	.0025
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	33	39	39	41	47	44	43	40	40	35	31
	38.2		50-55	0.03D	1.0D	SFM(Vc)	265	360	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0002	.0004	.0006	.0008	.0010	.0011	.0013	.0016	.0019	.0022	.0026
						RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	22	27	27	28	32	30	28	27	27	23	21
	39.1		56-60	0.03D	1.0D	SFM(Vc)	210	300	295	295	330	330	330	330	330	330	330
						IPT(fz)	.0002	.0003	.0004	.0006	.0007	.0008	.0010	.0012	.0014	.0016	.0019
						RPM	20500	14500	9500	7200	6400	5300	4000	3200	2650	2000	1600
						IPM(FEED)	14	16	16	17	18	18	16	15	15	13	12
	39.2		61-65	0.03D	1.0D	SFM(Vc)	165	225	230	230	265	260	265	265	260	265	270
						IPT(fz)	.0001	.0002	.0003	.0005	.0006	.0007	.0008	.0010	.0012	.0014	.0015
						RPM	16000	11000	7500	5600	5100	4200	3200	2550	2100	1600	1300
						IPM(FEED)	9	10	10	11	12	11	10	10	10	9	8
	39.3		66-70	0.03D	1.0D	SFM(Vc)	130	195	200	195	230	230	230	225	230	230	225
						IPT(fz)	.0001	.0002	.0003	.0004	.0005	.0005	.0007	.0008	.0009	.0011	.0014
						RPM	12500	9500	6400	4750	4450	3700	2800	2200	1860	1400	1100
						IPM(FEED)	6	7	7	8	9	8	8	7	7	6	6
	40	Chilled Cast Iron	42	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0002	.0004	.0006	.0008	.0009	.0011	.0014	.0016	.0019	.0022	.0025
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	33	39	39	41	47	44	43	40	40	35	31
	41	Hardened Cast Iron	55	0.03D	1.0D	SFM(Vc)	265	360	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0002	.0004	.0006	.0008	.0010	.0011	.0013	.0016	.0019	.0022	.0026
						RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	22	27	27	28	32	30	28	27	27	23	21

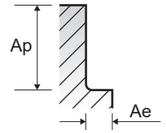


YG X5070 END MILLS — RECOMMENDED CUTTING CONDITIONS

G8A37 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 1	2	3	4	5	6	8	10	12	16	20
P	5	Non-alloy steel	32	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0003	.0005	.0008	.0011	.0013	.0015	.0019	.0022	.0026	.0030	.0033
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	58	69	69	71	79	77	74	69	69	59	51
	8-9	Low alloy steel	32-38	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0003	.0005	.0008	.0011	.0013	.0015	.0019	.0022	.0026	.0030	.0033
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	58	69	69	71	79	77	74	69	69	59	51
	11.1	High alloyed steel, and tool steel	35	0.03D	1.0D	SFM(Vc)	495	685	675	690	810	810	815	805	820	810	805
						IPT(fz)	.0003	.0005	.0008	.0011	.0013	.0015	.0019	.0022	.0026	.0030	.0033
						RPM	48000	33300	21800	16700	15700	13100	9880	7800	6650	4900	3900
						IPM(FEED)	58	69	69	71	79	77	74	69	69	59	51
	11.2		44	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0003	.0005	.0007	.0010	.0012	.0013	.0017	.0020	.0024	.0028	.0031
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	41	49	49	51	59	55	53	50	50	43	38
H	38.1	Hardened steel	45-49	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0003	.0005	.0007	.0010	.0012	.0013	.0017	.0020	.0024	.0028	.0031
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	41	49	49	51	59	55	53	50	50	43	38
	38.2		50-55	0.03D	1.0D	SFM(Vc)	265	360	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0003	.0005	.0007	.0010	.0012	.0013	.0017	.0020	.0024	.0028	.0032
						RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	28	33	33	35	39	37	35	33	33	29	26
	39.1		56-60	0.03D	1.0D	SFM(Vc)	210	300	295	295	330	330	330	330	330	330	330
						IPT(fz)	.0002	.0004	.0006	.0007	.0009	.0010	.0013	.0015	.0018	.0021	.0023
						RPM	20500	14500	9500	7200	6400	5300	4000	3200	2650	2000	1600
						IPM(FEED)	17	21	21	21	23	22	21	19	19	17	15
	39.2		61-65	0.03D	1.0D	SFM(Vc)	165	225	230	230	265	260	265	265	260	265	270
						IPT(fz)	.0002	.0003	.0004	.0006	.0007	.0008	.0010	.0012	.0014	.0017	.0019
						RPM	16000	11000	7500	5600	5100	4200	3200	2550	2100	1600	1300
						IPM(FEED)	11	13	13	13	15	14	13	12	12	11	10
	39.3		66-70	0.03D	1.0D	SFM(Vc)	130	195	200	195	230	230	230	225	230	230	225
						IPT(fz)	.0001	.0002	.0004	.0005	.0006	.0007	.0009	.0010	.0012	.0014	.0016
						RPM	12500	9500	6400	4750	4450	3700	2800	2200	1860	1400	1100
						IPM(FEED)	7	9	9	10	11	10	10	9	9	8	7
	40	Chilled Cast Iron	42	0.03D	1.0D	SFM(Vc)	390	535	535	545	645	640	645	635	650	645	640
						IPT(fz)	.0003	.0005	.0007	.0010	.0012	.0013	.0017	.0020	.0024	.0028	.0031
						RPM	38000	26000	17300	13200	12500	10350	7800	6150	5250	3900	3100
						IPM(FEED)	41	49	49	51	59	55	53	50	50	43	38
	41	Hardened Cast Iron	55	0.03D	1.0D	SFM(Vc)	265	360	355	365	430	425	430	425	435	430	425
						IPT(fz)	.0003	.0005	.0007	.0010	.0012	.0013	.0017	.0020	.0024	.0028	.0032
						RPM	25500	17500	11500	8800	8300	6900	5200	4100	3500	2600	2050
						IPM(FEED)	28	33	33	35	39	37	35	33	33	29	26



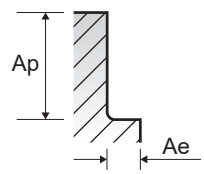
X5070 END MILLS

RECOMMENDED CUTTING CONDITIONS

G8A39 SERIES — 6 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	HRc	Ae	Ap	Parameter	Diameter (Ø) 6	8	10	12	16	20
P	5	Non-alloy steel	32	0.05D	1.0D	SFM(Vc)	395	395	395	400	395	400
						IPT(fz)	.0015	.0020	.0025	.0028	.0035	.0031
						RPM	6370	4810	3850	3240	2410	1930
						IPM(FEED)	59	59	57	54	51	36
	8-9	Low alloy steel	32-38	0.05D	1.0D	SFM(Vc)	395	395	395	400	395	400
						IPT(fz)	.0015	.0020	.0025	.0028	.0035	.0031
						RPM	6370	4810	3850	3240	2410	1930
						IPM(FEED)	59	59	57	54	51	36
	11.1	High alloyed steel, and tool steel	35	0.05D	1.0D	SFM(Vc)	395	395	395	400	395	400
						IPT(fz)	.0015	.0020	.0025	.0028	.0035	.0031
						RPM	6370	4810	3850	3240	2410	1930
						IPM(FEED)	59	59	57	54	51	36
	11.2		44	0.05D	1.0D	SFM(Vc)	350	355	345	350	355	360
						IPT(fz)	.0014	.0019	.0023	.0026	.0033	.0037
						RPM	5620	4300	3370	2810	2150	1750
						IPM(FEED)	48	50	46	43	42	39
H	38.1	Hardened steel	45-49	0.05D	1.0D	SFM(Vc)	350	355	345	350	355	360
						IPT(fz)	.0014	.0019	.0023	.0026	.0033	.0037
						RPM	5620	4300	3370	2810	2150	1750
						IPM(FEED)	48	50	46	43	42	39
	38.2		50-55	0.05D	1.0D	SFM(Vc)	310	320	310	310	320	320
						IPT(fz)	.0014	.0018	.0022	.0024	.0031	.0036
						RPM	5040	3860	2990	2520	1930	1560
						IPM(FEED)	42	42	39	37	36	34
	39.1		56-60	0.03D	1.0D	SFM(Vc)	270	270	270	270	270	285
						IPT(fz)	.0013	.0017	.0021	.0023	.0030	.0029
						RPM	4400	3300	2610	2200	1650	1390
						IPM(FEED)	34	34	33	31	30	24
	39.2		61-65	0.03D	1.0D	SFM(Vc)	235	235	235	235	235	245
						IPT(fz)	.0012	.0016	.0020	.0022	.0028	.0027
						RPM	3820	2870	2290	1910	1430	1190
						IPM(FEED)	28	28	27	25	24	19
	39.3		66-70	0.03D	1.0D	SFM(Vc)	160	155	160	165	160	150
						IPT(fz)	.0011	.0015	.0018	.0020	.0024	.0028
						RPM	2550	1910	1560	1330	960	720
						IPM(FEED)	17	17	17	16	14	12
	40	Chilled Cast Iron	42	0.05D	1.0D	SFM(Vc)	350	355	345	350	355	360
						IPT(fz)	.0014	.0019	.0023	.0026	.0033	.0037
						RPM	5620	4300	3370	2810	2150	1750
						IPM(FEED)	48	50	46	43	42	39
	41	Hardened Cast Iron	55	0.05D	1.0D	SFM(Vc)	310	320	310	310	320	320
						IPT(fz)	.0014	.0018	.0022	.0024	.0031	.0036
						RPM	5040	3860	2990	2520	1930	1560
						IPM(FEED)	42	42	39	37	36	34



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High Speed Cutting for Pre-Hardened Steels up to HRc55

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Recommended cutting conditions : p.C330

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	GMF15	GMF16	GMF17	GMF18	GMF19
	SERIES						GMF15	GMF16	GMF17	GMF18	GMF19
	FLUTE						2	2	4	2	2
	HELIX ANGLE						30°	30°	30°	30°	30°
	CUTTING EDGE SHAPE						BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS
	SIZE MIN						R.002	R.004	R1/16	D3/64	D.008
	SIZE MAX						R3/8	R1/4	R1/4	D3/4	D3/4
	PAGE						C192	C194	C197	C198	C201
							-	NECK	-	-	NECK
							Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15					
	13		Martensitic	Quenched & Tempered	240	23					
	14		Austenitic		180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○	○
	18		Pearlitic		250	25	○	○	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○	○	○
	20		Pearlitic		230	21	○	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60						
	22		Curable	Hardened	100						
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75						
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130						
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						
	27		CuZn, CuSnZn (Brass)		90						
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55	○	○	○	○	○
	39			Hardened	630	60					
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	○	○

ISO	VDI 3323	GMF20	GMF21	GMF22	GMF23	GMF24	GMF25	GMF26	GMF27	GMF28	GMF29	G907 G928	G908 G929	G909 G930
	SERIES	GMF20	GMF21	GMF22	GMF23	GMF24	GMF25	GMF26	GMF27	GMF28	GMF29	G907 G928	G908 G929	G909 G930
	FLUTE	4	4	2	2	2	4	4	4	4	6	4&5	4&5	4&5
	HELIX ANGLE	27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	30°	30°	30°	27°/30° (MULTIPLE HELIX)	35°/38° (MULTIPLE HELIX)	30°	30°	45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°
	CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING
	SIZE MIN	D3/64	D3/64	D.008	D.004	D3/64	D3/64	D3/64	D3/64	D3/64	D1/4	D1/4	D1/4	D1/4
	SIZE MAX	D3/4	D3/4	D1/2	D.120	D3/4	D3/4	D3/4	D1	D1/2	D3/4	D1	D1	D3/4
	PAGE	C207	C209	C214	C217	C220	C223	C224	C225	C228	C230	C231	C232	C233
		-	NECK	NECK	-	LONG LENGTH	-	-	LONG LENGTH	NECK	-	STUB LENGTH	REGULAR LENGTH	EXTENDED REACH
		Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	X-Coating	X-Coating	X-Coating
												X-SPEED ROUGHER	X-SPEED ROUGHER	X-SPEED ROUGHER
P	1	○	○	○	○	○	○	○	○	○	○	○	○	○
	2	○	◎	○	○	○	○	○	○	○	○	○	○	○
	3	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	4	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	5	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	6	○	○	○	○	○	○	○	○	○	○	○	○	○
	7	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	8	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	9	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	10	○	○	○	○	○	○	○	○	○	○	○	○	○
	11	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
M	12			○						○		○	○	○
	13			○						○		○	○	○
	14			○	○		○	○		○		○	○	○
K	15	○	○	○	○	○	○	○	○	○	○	◎	◎	◎
	16	○	○	○	○	○	○	○	○	○	○	◎	◎	◎
	17	○	○	○	○	○	○	○	○	○	○	◎	◎	◎
	18	○	○	○	○	○	○	○	○	○	○	◎	◎	◎
	19	○	○	○	○	○	○	○	○	○	○	◎	◎	◎
	20	○	○	○	○	○	○	○	○	○	○	◎	◎	◎
N	21													
	22													
	23													
	24													
	25													
	26											○	○	○
	27											○	○	○
	28											○	○	○
	29													
	30													
S	31													
	32													
	33													
	34													
	35													
	36													
	37													
H	38	○	○	○	○	○	○	○	○	○	○			
	39													
	40	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	41	○	○	○	○	○	○	○	○	○	○			

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
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V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE 4G Mill MILLS

High Speed Cutting for Pre-Hardened Steels up to HRc55

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C330

						Metric				
					SERIES	SEMD98	SEM846	SEM846	SEMD99	SEME61
					FLUTE	2	2	2	2	2
					HELIX ANGLE	30°	30°	30°	30°	30°
					CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS
					SIZE MIN	R0.05	R0.05	R0.25	D0.2	D0.2
					SIZE MAX	R12.5	R6.0	R1.0	D20.0	D20.0
					PAGE	C234	C239	C247	C250	C256
						-	LONG NECK	LONG NECK (6mm Shank)	-	LONG NECK
						Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating
						Call for Availability				

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc						
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○	○	1
	2		About 0.45% C	Annealed	190	13	○	○	○	○	○	2
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	◎	◎	3
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎	4
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎	5
	6	Low alloy steel		Annealed	180	10	○	○	○	○	○	6
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎	7
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎	8
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎	9
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○	○	10
	11			Quenched & Tempered	325	35	◎	◎	◎	◎	◎	11
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15						12
	13		Martensitic	Quenched & Tempered	240	23						13
	14		Austenitic		180	10						14
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○	○	15
	16		Pearlitic (Martensitic)		260	26	○	○	○	○	○	16
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○	○	17
	18		Pearlitic		250	25	○	○	○	○	○	18
	19	Malleable cast iron	Ferritic		130		○	○	○	○	○	19
	20		Pearlitic		230	21	○	○	○	○	○	20
N	21	Aluminum-wrought alloy	Not Curable		60							21
	22		Curable	Hardened	100							22
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75							23
	24		≤ 12% Si, Curable	Hardened	90							24
	25		> 12% Si, Not Curable		130							25
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110							26
	27		CuZn, CuSnZn (Brass)		90							27
	28		CuSn, lead-free copper and electrolytic copper		100							28
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic									29
	30		Rubber, Wood, etc.									30
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15						31
	32			Cured	280	30						32
	33		Ni or Co Based	Annealed	250	25						33
	34			Cured	350	38						34
	35			Cast	320	34						35
	36	Titanium Alloys	Pure Titanium		400 Rm							36
	37		Alpha + Beta Alloys	Hardened	1050 Rm							37
H	38	Hardened steel		Hardened	550	55	○	○	○	○	○	38
	39			Hardened	630	60						39
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	◎	◎	40
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	○	○	41

										Metric				
SEME01	SEME64	SEME35	SEME70	SEM845	SEME36	SEME71	SEME72	SEME73	SEME75	G9D75 G9D67	G9D76 G9D68	G9D77 G9D69	GAE53	
4	4	2	2	2	4	4	4	4	6	4&5	4&5	4&5	4&5	
27°/30° (MULTIPLE HELIX)	27°/30° (MULTIPLE HELIX)	30°	30°	30°	27°/30°	35°/38°	30°	30°	45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	4 Flute : 44°/45° 5 Flute : 44°/44.5°/45°	
CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	CORNER RADIUS ROUGHING	
D1.0	D1.0	D0.1	D1.0	D0.1	D0.8	D1.0	D1.0	D1.0	D6.0	D6.0	D6.0	D6.0	D6.0	
D20.0	D20.0	D25.0	D25.0	D12.0	D25.0	D20.0	D25.0	D12.0	D20.0	D20.0	D20.0	D20.0	D20.0	
C272	C278	C291	C296	C301	C309	C311	C314	C319	C324	C326	C327	C328	C329	
-	LONG NECK	-	LONG LENGTH	LONG NECK	-	-	LONG LENGTH	LONG NECK	-	SHORT LENGTH	LONG LENGTH	LONG REACH	SHORT LENGTH	
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	X-Coating	X-Coating	X-Coating	X-Coating	
Call for Availability														

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○	○	○	○	○	○	○	○	○	○					41	

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
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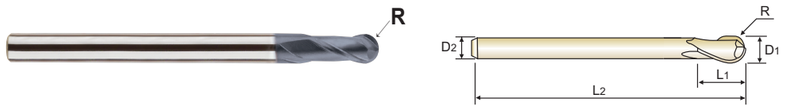
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF15 SERIES**

CARBIDE, 2 FLUTE BALL NOSE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55



CARBIDE | 2 | 30° | R ±.0002 | R ±.0004 | PLAIN | Y Coating | p.C330

R≤1/8 R>1/8

Unit : Inch

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF15901	R.002	.004	3/16	.008	1-1/2
GMF15902	R.004	.008	3/16	1/64	1-1/2
GMF15903	R.006	.012	3/16	1/32	1-1/2
GMF15904	R.075	.015	3/16	1/32	1-1/2
GMF15905	R.010	.020	3/16	3/64	1-1/2
GMF15906	R.012	.024	3/16	3/64	1-1/2
GMF15907	R.014	.028	3/16	1/16	1-1/2
GMF15908	R.0155	.031	3/16	1/16	1-1/2
GMF15909	R.0175	.035	3/16	5/64	1-1/2
GMF15003	R.0234	3/64	3/16	3/32	2
GMF15910	R.0234	3/64	1/4	3/32	2
GMF15911	R.0234	3/64	1/4	3/32	2-3/4
GMF15004	R1/32	1/16	3/16	5/32	2
GMF15912	R1/32	1/16	1/4	5/32	2
GMF15913	R1/32	1/16	1/4	5/32	2-3/4
GMF15005	R.0391	5/64	1/4	1/8	1-1/2
GMF15914	R.0391	5/64	3/16	3/16	2
GMF15915	R.0391	5/64	1/4	3/16	2
GMF15916	R.0391	5/64	1/4	3/16	3-1/8
GMF15006	R3/64	3/32	1/4	1/4	2-3/8
GMF15917	R3/64	3/32	1/4	1/4	3-1/8
GMF15008	R1/16	1/8	1/4	3/16	1-1/2
GMF15918	R1/16	1/8	3/16	1/4	2-3/8
GMF15919	R1/16	1/8	1/4	1/4	2-3/8
GMF15920	R1/16	1/8	1/4	1/4	3-1/8
GMF15921	R1/16	1/8	1/4	1/4	4
GMF15012	R3/32	3/16	1/4	1/4	2
GMF15922	R3/32	3/16	3/16	5/16	2-3/4
GMF15923	R3/32	3/16	1/4	5/16	2-3/4
GMF15924	R3/32	3/16	3/16	5/16	4
GMF15925	R3/32	3/16	1/4	5/16	4
GMF15926	R3/32	3/16	1/4	5/16	4-1/2

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎					○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
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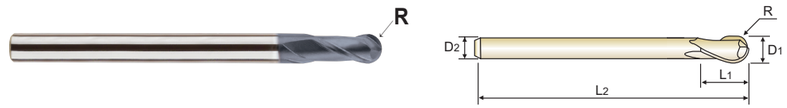
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF15 SERIES**

CARBIDE, 2 FLUTE BALL NOSE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55



CARBIDE | 2 | 30° | R ±.0002 | R ±.0004 | PLAIN | Y Coating | p.C330

R≤1/8 R>1/8

Unit : Inch

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF15013	R.102	13/64	1/4	5/16	2-3/8
GMF15927	R.102	13/64	1/4	3/8	3-1/8
GMF15016	R1/8	1/4	1/4	3/8	2
GMF15928	R1/8	1/4	1/4	3/8	3-1/8
GMF15929	R1/8	1/4	1/4	1/2	3-1/2
GMF15930	R1/8	1/4	1/4	1/2	5
GMF15018	R9/64	9/32	5/16	9/16	3-1/2
GMF15020	R5/32	5/16	5/16	1/2	2
GMF15931	R5/32	5/16	5/16	1/2	3-1/2
GMF15932	R5/32	5/16	5/16	9/16	4
GMF15933	R5/32	5/16	5/16	9/16	6
GMF15024	R3/16	3/8	3/8	5/8	2-3/8
GMF15934	R3/16	3/8	3/8	5/8	3-1/2
GMF15935	R3/16	3/8	3/8	11/16	4
GMF15936	R3/16	3/8	3/8	11/16	5
GMF15937	R3/16	3/8	3/8	11/16	6
GMF15938	R3/16	3/8	3/8	11/16	7
GMF15032	R1/4	1/2	1/2	11/16	3-1/8
GMF15939	R1/4	1/2	1/2	11/16	4
GMF15940	R1/4	1/2	1/2	7/8	4-1/4
GMF15941	R1/4	1/2	1/2	7/8	6
GMF15942	R1/4	1/2	1/2	7/8	8
GMF15036	R9/32	9/16	9/16	1	4
GMF15040	R5/16	5/8	5/8	1	4
GMF15943	R5/16	5/8	5/8	1-3/16	6
GMF15048	R3/8	3/4	3/4	1-3/16	4
GMF15944	R3/8	3/4	3/4	1-1/2	6

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h5
over Ø1/4	±.0004	0~-.0006	

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎					○	○	○	○	○	○

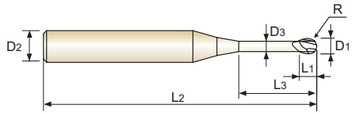
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF16 SERIES**

CARBIDE, 2 FLUTE BALL NOSE with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55



CARBIDE | 2 | 30° | R ±.0002 R≤1/8 | R ±.0004 R>1/8 | PLAIN | Y Coating | p.C332

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF16901	R.004	.008	3/16	.008	1/64	1-1/2	.006
GMF16902	R.004	.008	3/16	.008	3/64	1-1/2	.006
GMF16903	R.006	.012	3/16	.010	3/64	1-1/2	.010
GMF16904	R.006	.012	3/16	.010	5/64	1-1/2	.010
GMF16905	R.006	.012	3/16	.010	1/8	1-1/2	.010
GMF16906	R.0075	.015	3/16	1/64	3/64	1-1/2	.013
GMF16907	R.0075	.015	3/16	1/64	5/64	1-1/2	.013
GMF16908	R.0075	.015	3/16	1/64	1/8	1-1/2	.013
GMF16909	R.0075	.015	3/16	1/64	5/32	1-1/2	.013
GMF16910	R.010	.020	3/16	1/64	3/64	1-3/4	.018
GMF16911	R.010	.020	3/16	1/64	5/64	1-3/4	.018
GMF16912	R.010	.020	3/16	1/64	1/8	1-3/4	.018
GMF16913	R.010	.020	3/16	1/64	5/32	1-3/4	.018
GMF16914	R.010	.020	3/16	1/64	3/16	1-3/4	.018
GMF16915	R.010	.020	3/16	1/64	1/4	1-3/4	.018
GMF16916	R.010	.020	3/16	1/64	5/16	1-3/4	.018
GMF16917	R.010	.020	3/16	1/64	3/8	1-3/4	.018
GMF16918	R.012	.024	3/16	1/32	5/64	1-3/4	.022
GMF16919	R.012	.024	3/16	1/32	1/8	1-3/4	.022
GMF16920	R.012	.024	3/16	1/32	5/32	1-3/4	.022
GMF16921	R.012	.024	3/16	1/32	3/16	1-3/4	.022
GMF16922	R.012	.024	3/16	1/32	1/4	1-3/4	.022
GMF16923	R.012	.024	3/16	1/32	5/16	1-3/4	.022
GMF16924	R.012	.024	3/16	1/32	3/8	1-3/4	.022
GMF16925	R.012	.024	3/16	1/32	1/2	1-3/4	.022
GMF16002	R1/64	1/32	3/16	1/32	5/64	1-3/4	.029
GMF16926	R1/64	1/32	3/16	1/32	1/8	1-3/4	.029
GMF16927	R1/64	1/32	3/16	1/32	5/32	1-3/4	.029
GMF16928	R1/64	1/32	3/16	1/32	3/16	1-3/4	.029
GMF16929	R1/64	1/32	3/16	1/32	1/4	1-3/4	.029
GMF16930	R1/64	1/32	3/16	1/32	5/16	1-3/4	.029
GMF16931	R1/64	1/32	3/16	1/32	3/8	1-3/4	.029

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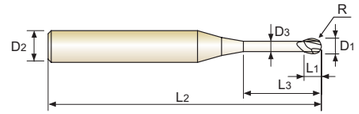
◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○	

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS
PLAIN SHANK GMF16 SERIES
CARBIDE, 2 FLUTE BALL NOSE with NECK
- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55



CARBIDE | 2 | 30° | R ±.0002 R≤1/8 | R ±.0004 R>1/8 | PLAIN | Y Coating | p.C332

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF16003	R.0234	3/64	3/16	3/64	1/8	2	.044
GMF16932	R.0234	3/64	3/16	3/64	5/32	2	.044
GMF16933	R.0234	3/64	3/16	3/64	3/16	2	.044
GMF16934	R.0234	3/64	3/16	3/64	1/4	2	.044
GMF16935	R.0234	3/64	3/16	3/64	5/16	2	.044
GMF16936	R.0234	3/64	3/16	3/64	3/8	2	.044
GMF16937	R.0234	3/64	3/16	3/64	1/2	2	.044
GMF16938	R.0234	3/64	3/16	3/64	9/16	2	.044
GMF16939	R.0234	3/64	3/16	3/64	5/8	2	.044
GMF16940	R.0234	3/64	3/16	3/64	3/4	2	.044
GMF16004	R1/32	1/16	3/16	1/16	5/32	2	.060
GMF16941	R1/32	1/16	3/16	1/16	1/4	2	.060
GMF16942	R1/32	1/16	3/16	1/16	5/16	2	.060
GMF16943	R1/32	1/16	3/16	1/16	3/8	2	.060
GMF16944	R1/32	1/16	3/16	1/16	1/2	2	.060
GMF16945	R1/32	1/16	3/16	1/16	9/16	2	.060
GMF16946	R1/32	1/16	3/16	1/16	5/8	2	.060
GMF16947	R1/32	1/16	3/16	1/16	3/4	2	.060
GMF16005	R.0391	5/64	3/16	5/64	1/4	2	.076
GMF16948	R.0391	5/64	3/16	5/64	5/16	2	.076
GMF16949	R.0391	5/64	3/16	5/64	3/8	2	.076
GMF16950	R.0391	5/64	3/16	5/64	1/2	2	.076
GMF16951	R.0391	5/64	3/16	5/64	9/16	2	.076
GMF16952	R.0391	5/64	3/16	5/64	5/8	2	.076
GMF16953	R.0391	5/64	3/16	5/64	11/16	2	.076
GMF16954	R.0391	5/64	3/16	5/64	3/4	2	.076
GMF16955	R.0391	5/64	3/16	5/64	1	2-3/8	.076
GMF16956	R.0391	5/64	3/16	5/64	1-3/16	2-3/4	.076
GMF16006	R3/64	3/32	3/16	3/32	3/8	2	.089
GMF16957	R3/64	3/32	3/16	3/32	3/4	2	.089
GMF16008	R1/16	1/8	1/4	1/8	5/16	2	.119
GMF16958	R1/16	1/8	1/4	1/8	3/8	2	.119

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◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○	

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

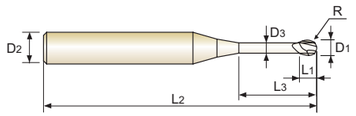
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF16 SERIES**

CARBIDE, 2 FLUTE BALL NOSE with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55



CARBIDE | 2 | 30° | R ±.0002 | R ±.0004 | PLAIN | Y Coating | p.C332

R≤1/8 R>1/8

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF16959	R1/16	1/8	1/4	1/8	1/2	2	.119
GMF16960	R1/16	1/8	1/4	1/8	9/16	2-3/8	.119
GMF16961	R1/16	1/8	1/4	1/8	5/8	2-3/8	.119
GMF16962	R1/16	1/8	1/4	1/8	11/16	2-3/8	.119
GMF16963	R1/16	1/8	1/4	1/8	3/4	2-3/8	.119
GMF16964	R1/16	1/8	1/4	1/8	1	2-3/4	.119
GMF16965	R1/16	1/8	1/4	1/8	1-3/16	2-3/4	.119
GMF16966	R1/16	1/8	1/4	1/8	1-3/8	2-3/4	.119
GMF16012	R3/32	3/16	1/4	5/32	3/8	2	.181
GMF16967	R3/32	3/16	1/4	5/32	1/2	2	.181
GMF16968	R3/32	3/16	1/4	5/32	9/16	2-3/8	.181
GMF16969	R3/32	3/16	1/4	5/32	5/8	2-3/8	.181
GMF16970	R3/32	3/16	1/4	5/32	11/16	2-3/8	.181
GMF16971	R3/32	3/16	1/4	5/32	3/4	2-3/8	.181
GMF16972	R3/32	3/16	1/4	5/32	1	2-3/4	.181
GMF16973	R3/32	3/16	1/4	5/32	1-3/16	2-3/4	.181
GMF16974	R3/32	3/16	1/4	5/32	1-3/8	2-3/4	.181
GMF16975	R3/32	3/16	1/4	5/32	1-1/2	3-1/8	.181
GMF16013	R.102	13/64	1/4	1/4	1-3/16	2-3/4	.197
GMF16016	R1/8	1/4	1/4	5/16	3/4	2-3/8	.244
GMF16976	R1/8	1/4	1/4	5/16	1-3/16	2-3/8	.244
GMF16020	R5/32	5/16	5/16	3/8	1	2-3/4	.300
GMF16977	R5/32	5/16	5/16	9/16	1-3/8	4	.300
GMF16024	R3/16	3/8	3/8	1/2	1-3/16	3	.363
GMF16978	R3/16	3/8	3/8	11/16	1-3/16	4	.363
GMF16979	R3/16	3/8	3/8	11/16	1-1/2	4	.363
GMF16032	R1/4	1/2	1/2	9/16	1-1/4	3-1/8	.488
GMF16980	R1/4	1/2	1/2	7/8	1-1/4	4-1/4	.488

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0005	h5
over Ø1/4	±.0004	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

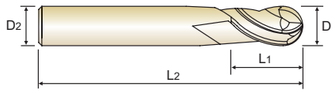
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF17 SERIES**

CARBIDE, 4 FLUTE BALL NOSE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55
- Cutting edge strength is increased and part finish is improved due to new End Geometry



CARBIDE | 4 | 30° | R ±.0002 | R ±.0004 | PLAIN | Y Coating | p.C338

R1/8 R>1/8

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMF17008	R1/16	1/8	1/4	1/8	2-3/8
GMF17012	R3/32	3/16	1/4	5/32	2-3/4
GMF17016	R1/8	1/4	1/4	1/4	3-1/2
GMF17020	R5/32	5/16	5/16	5/16	4
GMF17024	R3/16	3/8	3/8	3/8	4
GMF17032	R1/4	1/2	1/2	1/2	4-1/4

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0002	0~-.0008	h5
over Ø1/4	±.0004		

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

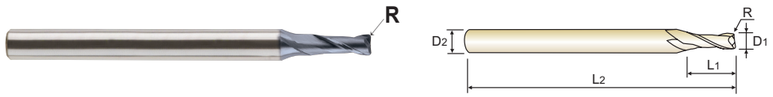
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF18 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in various length shanks and corner radiuses.



CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C339

D≤1/4 D>1/4

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMF18003	R.008	**3/64**	1/4	3/32	2
GMF18901	R.012	**3/64**	1/4	3/32	2
GMF18004	R.008	**1/16**	1/4	5/32	2
GMF18902	R.012	**1/16**	1/4	5/32	2
GMF18903	R.020	**1/16**	1/4	5/32	2
GMF18005	R.008	**5/64**	1/4	1/4	2
GMF18904	R.012	**5/64**	1/4	1/4	2
GMF18905	R.020	**5/64**	1/4	1/4	2
GMF18008	R.008	**1/8**	1/4	5/16	2-3/8
GMF18906	R.012	**1/8**	1/4	5/16	2-3/8
GMF18907	R.020	**1/8**	1/4	5/16	2-3/8
GMF18940	R.030	**1/8**	1/4	5/16	2-3/8
GMF18009	R.008	**9/64**	1/4	3/8	2-3/4
GMF18908	R.012	**9/64**	1/4	3/8	2-3/4
GMF18909	R.020	**9/64**	1/4	3/8	2-3/4
GMF18941	R.030	**9/64**	1/4	3/8	2-3/4
GMF18910	R.040	**9/64**	1/4	3/8	2-3/4
GMF18013	R.008	**13/64**	1/4	1/2	3-1/2
GMF18911	R.012	**13/64**	1/4	1/2	3-1/2
GMF18912	R.020	**13/64**	1/4	1/2	3-1/2
GMF18942	R.030	**13/64**	1/4	1/2	3-1/2
GMF18913	R.040	**13/64**	1/4	1/2	3-1/2
GMF18016	R.008	**1/4**	1/4	5/8	2-3/8
GMF18914	R.012	**1/4**	1/4	5/8	2-3/8
GMF18915	R.020	**1/4**	1/4	5/8	2-3/8
GMF18943	R.030	**1/4**	1/4	5/8	2-3/8

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎					○	○	○	○	○	○

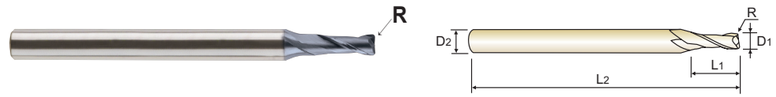
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK GMF18 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in various length shanks and corner radiuses.



CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C339

D≤1/4 D>1/4

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMF18916	R.040	**1/4**	1/4	5/8	2-3/8
GMF18917	R.008	**1/4**	1/4	5/8	3-1/2
GMF18918	R.012	**1/4**	1/4	5/8	3-1/2
GMF18919	R.020	**1/4**	1/4	5/8	3-1/2
GMF18944	R.030	**1/4**	1/4	5/8	3-1/2
GMF18920	R.040	**1/4**	1/4	5/8	3-1/2
GMF18020	R.020	**5/16**	5/16	3/4	2-3/4
GMF18945	R.030	**5/16**	5/16	3/4	2-3/4
GMF18921	R.040	**5/16**	5/16	3/4	2-3/4
GMF18922	R.020	**5/16**	5/16	3/4	4
GMF18946	R.030	**5/16**	5/16	3/4	4
GMF18923	R.040	**5/16**	5/16	3/4	4
GMF18924	R.060	**5/16**	5/16	3/4	4
GMF18925	R.080	**5/16**	5/16	3/4	4
GMF18024	R.020	**3/8**	3/8	1	3
GMF18947	R.030	**3/8**	3/8	1	3
GMF18926	R.040	**3/8**	3/8	1	3
GMF18927	R.020	**3/8**	3/8	1	4
GMF18948	R.030	**3/8**	3/8	1	4
GMF18928	R.040	**3/8**	3/8	1	4
GMF18929	R.060	**3/8**	3/8	1	4
GMF18930	R.080	**3/8**	3/8	1	4
GMF18032	R.020	**1/2**	1/2	1-3/16	3-1/8
GMF18949	R.030	**1/2**	1/2	1-3/16	3-1/8
GMF18931	R.040	**1/2**	1/2	1-3/16	3-1/8
GMF18932	R.020	**1/2**	1/2	1-3/16	4-1/4

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎					○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF18** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in various length shanks and corner radiuses.

CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C339

D≤1/4 D>1/4

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMF18950	R.030	1/2	1/2	1-3/16	4-1/4
GMF18933	R.040	1/2	1/2	1-3/16	4-1/4
GMF18934	R.060	1/2	1/2	1-3/16	4-1/4
GMF18935	R.080	1/2	1/2	1-3/16	4-1/4
GMF18936	R.100	1/2	1/2	1-3/16	4-1/4
GMF18937	R.118	1/2	1/2	1-3/16	4-1/4
GMF18951	R.030	9/16	5/8	1-3/8	6
GMF18036	R.040	9/16	5/8	1-3/8	6
GMF18952	R.030	5/8	5/8	1-1/4	6
GMF18040	R.040	5/8	5/8	1-1/4	6
GMF18938	R.080	5/8	5/8	1-1/4	6
GMF18953	R.030	3/4	3/4	1-1/2	6
GMF18048	R.040	3/4	3/4	1-1/2	6
GMF18939	R.080	3/4	3/4	1-1/2	6

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0004	0~-.0005	h5
over Ø1/4	±.0006	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

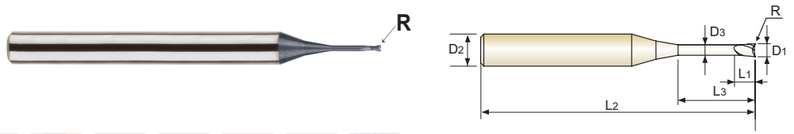
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF19** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.



CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C340

D≤1/4 D>1/4

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF19901	R.001	.008	3/16	.010	3/64	1-1/2	.006
GMF19902	R.002	.008	3/16	.010	3/64	1-1/2	.006
GMF19903	R.001	.012	3/16	1/64	3/64	1-1/2	.010
GMF19904	R.001	.012	3/16	1/64	5/64	1-1/2	.010
GMF19905	R.002	.012	3/16	1/64	3/64	1-1/2	.010
GMF19906	R.002	.012	3/16	1/64	5/64	1-1/2	.010
GMF19907	R.002	.015	3/16	1/32	3/64	1-1/2	.013
GMF19908	R.002	.015	3/16	1/32	1/16	1-1/2	.013
GMF19909	R.002	.015	3/16	1/32	5/64	1-1/2	.013
GMF19910	R.002	.015	3/16	1/32	3/32	1-1/2	.013
GMF19911	R.004	.015	3/16	1/32	3/64	1-1/2	.013
GMF19912	R.004	.015	3/16	1/32	5/64	1-1/2	.013
GMF19913	R.002	.020	3/16	1/32	3/64	1-3/4	.018
GMF19914	R.002	.020	3/16	1/32	1/16	1-3/4	.018
GMF19915	R.002	.020	3/16	1/32	5/64	1-3/4	.018
GMF19916	R.002	.020	3/16	1/32	5/32	1-3/4	.018
GMF19917	R.004	.020	3/16	1/32	5/64	1-3/4	.018
GMF19918	R.004	.020	3/16	1/32	1/8	1-3/4	.018
GMF19919	R.002	.024	3/16	1/32	1/8	1-3/4	.022
GMF19920	R.002	.024	3/16	1/32	1/4	1-3/4	.022
GMF19921	R.004	.024	3/16	1/32	5/64	1-3/4	.022
GMF19922	R.004	.024	3/16	1/32	5/32	1-3/4	.022
GMF19923	R.004	.024	3/16	1/32	1/4	1-3/4	.022
GMF19924	R.008	.024	3/16	1/32	5/64	1-3/4	.022
GMF19925	R.008	.024	3/16	1/32	5/32	1-3/4	.022
GMF19926	R.008	.024	3/16	1/32	1/4	1-3/4	.022
GMF19927	R.002	.031	3/16	3/64	5/64	1-3/4	.029
GMF19928	R.002	.031	3/16	3/64	5/32	1-3/4	.029
GMF19929	R.002	.031	3/16	3/64	1/4	1-3/4	.029
GMF19930	R.004	.031	3/16	3/64	5/64	1-3/4	.029

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF19 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.

CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C340

D≤1/4 D>1/4

Unit : Inch

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF19931	R.004	.031	3/16	3/64	5/32	1-3/4	.029
GMF19932	R.004	.031	3/16	3/64	1/4	1-3/4	.029
GMF19933	R.004	.031	3/16	3/64	5/16	1-3/4	.029
GMF19934	R.008	.031	3/16	3/64	5/32	1-3/4	.029
GMF19935	R.008	.031	3/16	3/64	1/4	1-3/4	.029
GMF19936	R.008	.031	3/16	3/64	5/16	1-3/4	.029
GMF19003	R.002	3/64	3/16	1/16	1/8	2	.044
GMF19937	R.002	3/64	3/16	1/16	5/32	2	.044
GMF19938	R.002	3/64	3/16	1/16	1/4	2	.044
GMF19939	R.004	3/64	3/16	1/16	1/8	2	.044
GMF19940	R.004	3/64	3/16	1/16	5/32	2	.044
GMF19941	R.004	3/64	3/16	1/16	1/4	2	.044
GMF19942	R.004	3/64	3/16	1/16	5/16	2	.044
GMF19943	R.004	3/64	3/16	1/16	3/8	2	.044
GMF19944	R.008	3/64	3/16	1/16	1/8	2	.044
GMF19945	R.008	3/64	3/16	1/16	5/32	2	.044
GMF19946	R.008	3/64	3/16	1/16	1/4	2	.044
GMF19947	R.008	3/64	3/16	1/16	5/16	2	.044
GMF19948	R.008	3/64	3/16	1/16	3/8	2	.044
GMF19949	R.012	3/64	3/16	1/16	5/32	2	.044
GMF19950	R.012	3/64	3/16	1/16	1/4	2	.044
GMF19951	R.012	3/64	3/16	1/16	5/16	2	.044
GMF19952	R.012	3/64	3/16	1/16	3/8	2	.044
GMF19004	R.002	1/16	3/16	3/32	5/32	2	.060
GMF19953	R.002	1/16	3/16	3/32	1/4	2	.060
GMF19954	R.002	1/16	3/16	3/32	5/16	2	.060
GMF19955	R.004	1/16	3/16	3/32	5/32	2	.060
GMF19956	R.004	1/16	3/16	3/32	1/4	2	.060
GMF19957	R.004	1/16	3/16	3/32	5/16	2	.060
GMF19958	R.008	1/16	3/16	3/32	5/32	2	.060

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS
PLAIN SHANK GMF19 SERIES
CARBIDE, 2 FLUTE CORNER RADIUS with NECK
- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
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CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C340
D≤1/4 D>1/4
Unit : Inch

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF19959	R.008	1/16	3/16	3/32	1/4	2	.060
GMF19960	R.008	1/16	3/16	3/32	5/16	2	.060
GMF19961	R.008	1/16	3/16	3/32	3/8	2	.060
GMF19962	R.008	1/16	3/16	3/32	1/2	2	.060
GMF19963	R.012	1/16	3/16	3/32	5/32	2	.060
GMF19964	R.012	1/16	3/16	3/32	1/4	2	.060
GMF19965	R.012	1/16	3/16	3/32	5/16	2	.060
GMF19966	R.012	1/16	3/16	3/32	3/8	2	.060
GMF19967	R.012	1/16	3/16	3/32	1/2	2	.060
GMF19005	R.004	5/64	3/16	1/8	1/4	2	.076
GMF19968	R.004	5/64	3/16	1/8	5/16	2	.076
GMF19969	R.004	5/64	3/16	1/8	3/8	2	.076
GMF19970	R.004	5/64	3/16	1/8	1/2	2	.076
GMF19971	R.008	5/64	3/16	1/8	1/4	2	.076
GMF19972	R.008	5/64	3/16	1/8	5/16	2	.076
GMF19973	R.008	5/64	3/16	1/8	3/8	2	.076
GMF19974	R.008	5/64	3/16	1/8	1/2	2	.076
GMF19975	R.008	5/64	3/16	1/8	5/8	2	.076
GMF19976	R.012	5/64	3/16	1/8	1/4	2	.076
GMF19977	R.012	5/64	3/16	1/8	5/16	2	.076
GMF19978	R.012	5/64	3/16	1/8	3/8	2	.076
GMF19979	R.012	5/64	3/16	1/8	1/2	2	.076
GMF19980	R.012	5/64	3/16	1/8	5/8	2	.076
GMF19981	R.020	5/64	3/16	1/8	1/4	2	.076
GMF19982	R.020	5/64	3/16	1/8	5/16	2	.076
GMF19983	R.020	5/64	3/16	1/8	3/8	2	.076
GMF19984	R.020	5/64	3/16	1/8	1/2	2	.076
GMF19985	R.020	5/64	3/16	1/8	9/16	2	.076
GMF19008	R.004	1/8	1/4	3/16	3/8	2	.119
GMF19986	R.004	1/8	1/4	3/16	1/2	2	.119

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF19 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.

CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C340

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF19987	R.004	1/8	1/4	3/16	5/8	2-3/8	.119
GMF19988	R.008	1/8	1/4	3/16	5/16	2	.119
GMF19989	R.008	1/8	1/4	3/16	3/8	2	.119
GMF19990	R.008	1/8	1/4	3/16	1/2	2	.119
GMF19991	R.008	1/8	1/4	3/16	5/8	2-3/8	.119
GMF19992	R.008	1/8	1/4	3/16	3/4	2-3/8	.119
GMF19993	R.008	1/8	1/4	3/16	1	2-3/4	.119
GMF19994	R.012	1/8	1/4	3/16	5/16	2	.119
GMF19995	R.012	1/8	1/4	3/16	3/8	2	.119
GMF19996	R.012	1/8	1/4	3/16	1/2	2	.119
GMF19997	R.012	1/8	1/4	3/16	5/8	2-3/8	.119
GMF19998	R.012	1/8	1/4	3/16	3/4	2-3/8	.119
GMF19999	R.020	1/8	1/4	3/16	5/16	2	.119
GMF19801	R.020	1/8	1/4	3/16	3/8	2	.119
GMF19802	R.020	1/8	1/4	3/16	1/2	2	.119
GMF19803	R.020	1/8	1/4	3/16	5/8	2-3/8	.119
GMF19804	R.020	1/8	1/4	3/16	3/4	2-3/8	.119
GMF19805	R.020	1/8	1/4	3/16	1	2-3/4	.119
GMF19845	R.030	1/8	1/4	3/16	3/8	2	.119
GMF19846	R.030	1/8	1/4	3/16	1/2	2	.119
GMF19847	R.030	1/8	1/4	3/16	5/16	2	.119
GMF19848	R.030	1/8	1/4	3/16	3/4	2-3/8	.119
GMF19849	R.030	1/8	1/4	3/16	5/8	2-3/8	.119
GMF19850	R.030	1/8	1/4	3/16	1	2-3/4	.119
GMF19806	R.040	1/8	1/4	3/16	5/16	2	.119
GMF19807	R.040	1/8	1/4	3/16	3/8	2	.119
GMF19808	R.040	1/8	1/4	3/16	1/2	2	.119
GMF19809	R.040	1/8	1/4	3/16	5/8	2-3/8	.119
GMF19810	R.040	1/8	1/4	3/16	3/4	2-3/8	.119
GMF19012	R.004	3/16	1/4	1/4	3/8	2	.181

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK GMF19 SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.

CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C340

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF19811	R.004	3/16	1/4	1/4	1/2	2	.181
GMF19812	R.004	3/16	1/4	1/4	5/8	2-3/8	.181
GMF19813	R.008	3/16	1/4	1/4	3/8	2	.181
GMF19814	R.008	3/16	1/4	1/4	1/2	2	.181
GMF19815	R.008	3/16	1/4	1/4	5/8	2-3/8	.181
GMF19816	R.008	3/16	1/4	1/4	3/4	2-3/8	.181
GMF19817	R.008	3/16	1/4	1/4	1	2-3/4	.181
GMF19818	R.012	3/16	1/4	1/4	1/2	2	.181
GMF19819	R.012	3/16	1/4	1/4	5/8	2-3/8	.181
GMF19820	R.012	3/16	1/4	1/4	3/4	2-3/8	.181
GMF19821	R.012	3/16	1/4	1/4	1	2-3/4	.181
GMF19822	R.020	3/16	1/4	1/4	3/8	2	.181
GMF19823	R.020	3/16	1/4	1/4	1/2	2	.181
GMF19824	R.020	3/16	1/4	1/4	5/8	2-3/8	.181
GMF19825	R.020	3/16	1/4	1/4	3/4	2-3/8	.181
GMF19826	R.020	3/16	1/4	1/4	1	2-3/4	.181
GMF19827	R.020	3/16	1/4	1/4	1-3/16	2-3/4	.181
GMF19851	R.030	3/16	1/4	1/4	3/8	2	.181
GMF19852	R.030	3/16	1/4	1/4	1/2	2	.181
GMF19853	R.030	3/16	1/4	1/4	5/8	2-3/8	.181
GMF19854	R.030	3/16	1/4	1/4	3/4	2-3/8	.181
GMF19855	R.030	3/16	1/4	1/4	1	2-3/4	.181
GMF19856	R.030	3/16	1/4	1/4	1-3/16	2-3/4	.181
GMF19828	R.040	3/16	1/4	1/4	3/8	2	.181
GMF19829	R.040	3/16	1/4	1/4	1/2	2	.181
GMF19830	R.040	3/16	1/4	1/4	5/8	2-3/8	.181
GMF19831	R.040	3/16	1/4	1/4	3/4	2-3/8	.181
GMF19016	R.008	1/4	1/4	3/8	3/4	2-3/8	.244
GMF19832	R.012	1/4	1/4	3/8	3/4	2-3/8	.244
GMF19833	R.020	1/4	1/4	3/8	3/4	2-3/8	.244

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

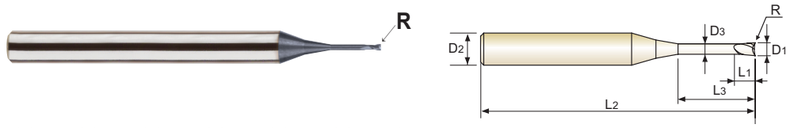
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF19** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.



CARBIDE | 2 | 30° | R ±.0004 | R ±.0006 | PLAIN | Y Coating | p.C340

D≤1/4 D>1/4

Unit : Inch

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF19834	R.040	1/4	1/4	3/8	3/4	2-3/8	.244
GMF19835	R.020	1/4	1/4	5/8	1-3/16	3-1/2	.244
GMF19857	R.030	1/4	1/4	3/8	3/4	2-3/8	.244
GMF19858	R.030	1/4	1/4	5/8	1-3/16	3-1/2	.244
GMF19020	R.008	5/16	5/16	1/2	1	2-3/4	.300
GMF19836	R.012	5/16	5/16	1/2	1	2-3/4	.300
GMF19837	R.020	5/16	5/16	1/2	1	2-3/4	.300
GMF19859	R.030	5/16	5/16	1/2	1	2-3/4	.300
GMF19838	R.040	5/16	5/16	1/2	1	2-3/4	.300
GMF19024	R.012	3/8	3/8	5/8	1-3/16	3	.363
GMF19839	R.020	3/8	3/8	5/8	1-3/16	3	.363
GMF19860	R.030	3/8	3/8	5/8	1-3/16	3	.363
GMF19840	R.040	3/8	3/8	5/8	1-3/16	3	.363
GMF19032	R.020	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF19861	R.030	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF19841	R.040	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF19842	R.060	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF19040	R.020	5/8	5/8	3/4	1-3/8	4	.613
GMF19862	R.030	5/8	5/8	3/4	1-3/8	4	.613
GMF19843	R.040	5/8	5/8	3/4	1-3/8	4	.613
GMF19048	R.020	3/4	3/4	1	1-1/2	4	.738
GMF19863	R.030	3/4	3/4	1	1-1/2	4	.738
GMF19844	R.040	3/4	3/4	1	1-1/2	4	.738

Size	Radius Tolerance (Inch)	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	±.0004	0~-.0005	h5
over Ø1/4	±.0006	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

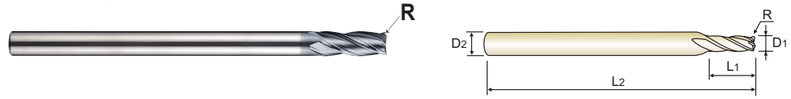
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF20** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations



CARBIDE | 4 | 27°/30° | R ±.0008 | PLAIN | Y Coating | p.C344

D1<Ø1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF20003	R.004	3/64	1/4	3/32	2
GMF20005	R.004	5/64	1/4	1/4	2
GMF20901	R.008	5/64	1/4	1/4	2
GMF20008	R.008	1/8	1/4	5/16	2-3/8
GMF20902	R.012	1/8	1/4	5/16	2-3/8
GMF20903	R.020	1/8	1/4	5/16	2-3/8
GMF20933	R.030	1/8	1/4	5/16	2-3/8
GMF20012	R.008	3/16	1/4	3/8	2-3/4
GMF20904	R.012	3/16	1/4	3/8	2-3/4
GMF20905	R.020	3/16	1/4	3/8	2-3/4
GMF20934	R.030	3/16	1/4	3/8	2-3/4
GMF20906	R.040	3/16	1/4	3/8	2-3/4
GMF20013	R.012	13/64	1/4	1/2	3-1/2
GMF20907	R.020	13/64	1/4	1/2	3-1/2
GMF20935	R.030	13/64	1/4	1/2	3-1/2
GMF20016	R.008	1/4	1/4	5/8	3-1/2
GMF20908	R.012	1/4	1/4	5/8	3-1/2
GMF20909	R.020	1/4	1/4	5/8	3-1/2
GMF20936	R.030	1/4	1/4	5/8	3-1/2
GMF20910	R.040	1/4	1/4	5/8	3-1/2
GMF20020	R.012	5/16	5/16	3/4	2-3/4
GMF20911	R.020	5/16	5/16	3/4	2-3/4
GMF20937	R.030	5/16	5/16	3/4	2-3/4
GMF20912	R.040	5/16	5/16	3/4	2-3/4
GMF20913	R.008	5/16	5/16	3/4	4
GMF20914	R.012	5/16	5/16	3/4	4
GMF20915	R.020	5/16	5/16	3/4	4
GMF20938	R.030	5/16	5/16	3/4	4
GMF20916	R.040	5/16	5/16	3/4	4
GMF20917	R.060	5/16	5/16	3/4	4

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

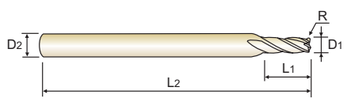
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF20 SERIES**

CARBIDE, 4 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations



CARBIDE | 4 | 27°/30° | R ±.0008 | PLAIN | Y Coating | p.C344

D1<Ø1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMF20918	R.080	5/16	5/16	3/4	4
GMF20024	R.020	3/8	3/8	1	3
GMF20939	R.030	3/8	3/8	1	3
GMF20919	R.012	3/8	3/8	1	4
GMF20920	R.020	3/8	3/8	1	4
GMF20940	R.030	3/8	3/8	1	4
GMF20921	R.040	3/8	3/8	1	4
GMF20922	R.060	3/8	3/8	1	4
GMF20923	R.080	3/8	3/8	1	4
GMF20032	R.020	1/2	1/2	1-3/16	3-1/8
GMF20941	R.030	1/2	1/2	1-3/16	3-1/8
GMF20924	R.040	1/2	1/2	1-3/16	3-1/8
GMF20925	R.020	1/2	1/2	1-3/16	4-1/4
GMF20942	R.030	1/2	1/2	1-3/16	4-1/4
GMF20926	R.040	1/2	1/2	1-3/16	4-1/4
GMF20927	R.060	1/2	1/2	1-3/16	4-1/4
GMF20928	R.080	1/2	1/2	1-3/16	4-1/4
GMF20040	R.020	5/8	5/8	1-1/4	6
GMF20943	R.030	5/8	5/8	1-1/4	6
GMF20929	R.040	5/8	5/8	1-1/4	6
GMF20930	R.060	5/8	5/8	1-1/4	6
GMF20931	R.080	5/8	5/8	1-1/4	6
GMF20944	R.030	3/4	3/4	1-1/2	6
GMF20048	R.040	3/4	3/4	1-1/2	6
GMF20932	R.080	3/4	3/4	1-1/2	6

Mill Dia. Tolerance (Inch)	Corner Radius Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	±.0008	h5

◎ : Excellent ○ : Good

ISO	P													M				K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230				
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○				

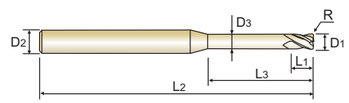
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF21 SERIES**

CARBIDE, 4 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations



CARBIDE | 4 | 27°/30° | R ±.0008 | PLAIN | Y Coating | p.C345

D1<Ø1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF21003	R.004	3/64	3/16	1/16	5/32	2	.044
GMF21901	R.004	3/64	3/16	1/16	1/4	2	.044
GMF21902	R.004	3/64	3/16	1/16	5/16	2	.044
GMF21903	R.008	3/64	3/16	1/16	5/32	2	.044
GMF21904	R.008	3/64	3/16	1/16	1/4	2	.044
GMF21905	R.008	3/64	3/16	1/16	5/16	2	.044
GMF21906	R.012	3/64	3/16	1/16	5/32	2	.044
GMF21907	R.012	3/64	3/16	1/16	1/4	2	.044
GMF21908	R.012	3/64	3/16	1/16	5/16	2	.044
GMF21004	R.004	1/16	3/16	3/32	1/4	2	.060
GMF21909	R.004	1/16	3/16	3/32	5/16	2	.060
GMF21910	R.004	1/16	3/16	3/32	3/8	2	.060
GMF21911	R.004	1/16	3/16	3/32	1/2	2	.060
GMF21912	R.008	1/16	3/16	3/32	1/4	2	.060
GMF21913	R.008	1/16	3/16	3/32	5/16	2	.060
GMF21914	R.008	1/16	3/16	3/32	3/8	2	.060
GMF21915	R.008	1/16	3/16	3/32	1/2	2	.060
GMF21916	R.012	1/16	3/16	3/32	1/4	2	.060
GMF21917	R.012	1/16	3/16	3/32	5/16	2	.060
GMF21918	R.012	1/16	3/16	3/32	3/8	2	.060
GMF21919	R.012	1/16	3/16	3/32	1/2	2	.060
GMF21920	R.020	1/16	3/16	3/32	1/4	2	.060
GMF21921	R.020	1/16	3/16	3/32	5/16	2	.060
GMF21922	R.020	1/16	3/16	3/32	3/8	2	.060
GMF21923	R.020	1/16	3/16	3/32	1/2	2	.060
GMF21005	R.004	5/64	3/16	1/8	1/4	2	.076
GMF21924	R.004	5/64	3/16	1/8	5/16	2	.076
GMF21925	R.004	5/64	3/16	1/8	3/8	2	.076
GMF21926	R.004	5/64	3/16	1/8	1/2	2	.076
GMF21927	R.008	5/64	3/16	1/8	1/4	2	.076

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◎ : Excellent ○ : Good

ISO	P													M				K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230				
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○				

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																				◎	○

4G MILL END MILLS

PLAIN SHANK **GMF21** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
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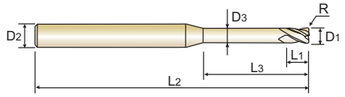

CARBIDE | 4 | 27°/30° | R ±.0008 | PLAIN | Y Coating | p.C345

D1<Ø1/8, 30˚ Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF21928	R.008	5/64	3/16	1/8	5/16	2	.076
GMF21929	R.008	5/64	3/16	1/8	3/8	2	.076
GMF21930	R.008	5/64	3/16	1/8	1/2	2	.076
GMF21931	R.012	5/64	3/16	1/8	1/4	2	.076
GMF21932	R.012	5/64	3/16	1/8	5/16	2	.076
GMF21933	R.012	5/64	3/16	1/8	3/8	2	.076
GMF21934	R.012	5/64	3/16	1/8	1/2	2	.076
GMF21935	R.020	5/64	3/16	1/8	1/4	2	.076
GMF21936	R.020	5/64	3/16	1/8	5/16	2	.076
GMF21937	R.020	5/64	3/16	1/8	3/8	2	.076
GMF21938	R.020	5/64	3/16	1/8	1/2	2	.076
GMF21008	R.004	1/8	1/4	3/16	5/16	2	.119
GMF21939	R.004	1/8	1/4	3/16	3/8	2	.119
GMF21940	R.004	1/8	1/4	3/16	1/2	2	.119
GMF21941	R.004	1/8	1/4	3/16	5/8	2-3/8	.119
GMF21942	R.008	1/8	1/4	3/16	3/8	2	.119
GMF21943	R.008	1/8	1/4	3/16	1/2	2	.119
GMF21944	R.008	1/8	1/4	3/16	5/8	2-3/8	.119
GMF21945	R.008	1/8	1/4	3/16	3/4	2-3/8	.119
GMF21946	R.012	1/8	1/4	3/16	5/16	2	.119
GMF21947	R.012	1/8	1/4	3/16	3/8	2	.119
GMF21948	R.012	1/8	1/4	3/16	1/2	2	.119
GMF21949	R.012	1/8	1/4	3/16	5/8	2-3/8	.119
GMF21950	R.012	1/8	1/4	3/16	3/4	2-3/8	.119
GMF21951	R.020	1/8	1/4	3/16	5/16	2	.119
GMF21952	R.020	1/8	1/4	3/16	3/8	2	.119
GMF21953	R.020	1/8	1/4	3/16	1/2	2	.119
GMF21954	R.020	1/8	1/4	3/16	5/8	2-3/8	.119
GMF21955	R.020	1/8	1/4	3/16	3/4	2-3/8	.119
GMF21956	R.020	1/8	1/4	3/16	1	2-3/4	.119

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL
INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF21** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS with NECK

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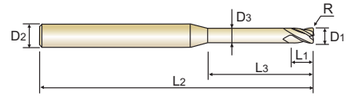

CARBIDE | 4 | 27°/30° | R ±.0008 | PLAIN | Y Coating | p.C345

D1<Ø1/8, 30˚ Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF21999	R.030	1/8	1/4	3/16	5/16	2	.119
GMF21801	R.030	1/8	1/4	3/16	3/8	2	.119
GMF21802	R.030	1/8	1/4	3/16	1/2	2	.119
GMF21803	R.030	1/8	1/4	3/16	5/8	2-3/8	.119
GMF21804	R.030	1/8	1/4	3/16	3/4	2-3/8	.119
GMF21805	R.030	1/8	1/4	3/16	1	2-3/4	.119
GMF21957	R.040	1/8	1/4	3/16	5/16	2	.119
GMF21958	R.040	1/8	1/4	3/16	3/8	2	.119
GMF21959	R.040	1/8	1/4	3/16	1/2	2	.119
GMF21960	R.040	1/8	1/4	3/16	5/8	2-3/8	.119
GMF21012	R.004	3/16	1/4	1/4	3/8	2	.181
GMF21961	R.004	3/16	1/4	1/4	1/2	2	.181
GMF21962	R.004	3/16	1/4	1/4	5/8	2-3/8	.181
GMF21963	R.004	3/16	1/4	1/4	3/4	2-3/8	.181
GMF21964	R.008	3/16	1/4	1/4	3/8	2	.181
GMF21965	R.008	3/16	1/4	1/4	1/2	2	.181
GMF21966	R.008	3/16	1/4	1/4	5/8	2-3/8	.181
GMF21967	R.008	3/16	1/4	1/4	3/4	2-3/8	.181
GMF21968	R.008	3/16	1/4	1/4	1	2-3/4	.181
GMF21969	R.012	3/16	1/4	1/4	3/8	2	.181
GMF21970	R.012	3/16	1/4	1/4	1/2	2	.181
GMF21971	R.012	3/16	1/4	1/4	5/8	2-3/8	.181
GMF21972	R.012	3/16	1/4	1/4	3/4	2-3/8	.181
GMF21973	R.012	3/16	1/4	1/4	1	2-3/4	.181
GMF21974	R.020	3/16	1/4	1/4	3/8	2	.181
GMF21975	R.020	3/16	1/4	1/4	1/2	2	.181
GMF21976	R.020	3/16	1/4	1/4	5/8	2-3/8	.181
GMF21977	R.020	3/16	1/4	1/4	3/4	2-3/8	.181
GMF21978	R.020	3/16	1/4	1/4	1	2-3/4	.181
GMF21806	R.030	3/16	1/4	1/4	3/8	2	.181

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF21** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS with NECK

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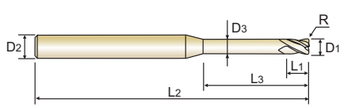

CARBIDE | 4 | 27°/30° | R ±.0008 | PLAIN | Y Coating | p.C345

D1<Ø1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF21807	R.030	3/16	1/4	1/4	1/2	2	.181
GMF21808	R.030	3/16	1/4	1/4	5/8	2-3/8	.181
GMF21809	R.030	3/16	1/4	1/4	3/4	2-3/8	.181
GMF21810	R.030	3/16	1/4	1/4	1	2-3/4	.181
GMF21979	R.040	3/16	1/4	1/4	3/8	2	.181
GMF21980	R.040	3/16	1/4	1/4	1/2	2	.181
GMF21981	R.040	3/16	1/4	1/4	5/8	2-3/8	.181
GMF21982	R.040	3/16	1/4	1/4	3/4	2-3/8	.181
GMF21983	R.040	3/16	1/4	1/4	1	2-3/4	.181
GMF21016	R.012	1/4	1/4	3/8	3/4	2-3/8	.244
GMF21984	R.020	1/4	1/4	3/8	3/4	2-3/8	.244
GMF21811	R.030	1/4	1/4	3/8	3/4	2-3/8	.244
GMF21985	R.040	1/4	1/4	3/8	3/4	2-3/8	.244
GMF21020	R.008	5/16	5/16	1/2	1	2-3/4	.300
GMF21986	R.012	5/16	5/16	1/2	1	2-3/4	.300
GMF21987	R.020	5/16	5/16	1/2	1	2-3/4	.300
GMF21988	R.040	5/16	5/16	1/2	1	2-3/4	.300
GMF21989	R.020	5/16	5/16	3/4	1-3/8	4	.300
GMF21812	R.030	5/16	5/16	1/2	1	2-3/4	.300
GMF21813	R.030	5/16	5/16	3/4	1-3/8	4	.300
GMF21024	R.020	3/8	3/8	5/8	1-3/16	3	.363
GMF21990	R.040	3/8	3/8	5/8	1-3/16	3	.363
GMF21991	R.060	3/8	3/8	5/8	1-3/16	3	.363
GMF21992	R.020	3/8	3/8	1	1-1/2	4	.363
GMF21814	R.030	3/8	3/8	5/8	1-3/16	3	.363
GMF21815	R.030	3/8	3/8	1	1-1/2	4	.363
GMF21032	R.020	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF21816	R.030	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF21817	R.030	1/2	1/2	1-3/16	1-3/4	4-1/4	.488
GMF21993	R.040	1/2	1/2	11/16	1-1/4	3-1/8	.488

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

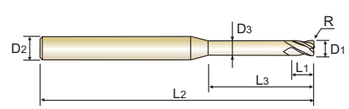
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF21** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations



CARBIDE | 4 | 27°/30° | R ±.0008 | PLAIN | Y Coating | p.C345

D1<Ø1/8, 30° Helix

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GMF21994	R.060	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF21995	R.080	1/2	1/2	11/16	1-1/4	3-1/8	.488
GMF21996	R.020	1/2	1/2	1-3/16	1-3/4	4-1/4	.488
GMF21040	R.020	5/8	5/8	3/4	1-3/8	4	.613
GMF21818	R.030	5/8	5/8	3/4	1-3/8	4	.613
GMF21997	R.040	5/8	5/8	3/4	1-3/8	4	.613
GMF21048	R.020	3/4	3/4	1	1-1/2	4	.738
GMF21819	R.030	3/4	3/4	1	1-1/2	4	.738
GMF21998	R.040	3/4	3/4	1	1-1/2	4	.738

Mill Dia. Tolerance (Inch)	Corner Radius Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	±.0008	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

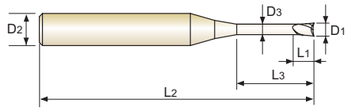
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF22** SERIES

CARBIDE, 2 FLUTE with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- Excellent for Rib Processing of various depths



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C347

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF22901	.008	3/16	.010	3/64	1-1/2	.006
GMF22902	.015	3/16	1/32	3/64	1-1/2	.013
GMF22903	.015	3/16	1/32	5/64	1-1/2	.013
GMF22904	.015	3/16	1/32	1/8	1-1/2	.013
GMF22905	.015	3/16	1/32	5/32	1-1/2	.013
GMF22906	.015	3/16	1/32	3/16	1-1/2	.013
GMF22907	.020	3/16	1/32	5/64	1-3/4	.018
GMF22908	.020	3/16	1/32	1/8	1-3/4	.018
GMF22909	.020	3/16	1/32	5/32	1-3/4	.018
GMF22910	.020	3/16	1/32	3/16	1-3/4	.018
GMF22911	.020	3/16	1/32	1/4	1-3/4	.018
GMF22912	.024	3/16	1/32	5/64	1-3/4	.022
GMF22913	.024	3/16	1/32	1/8	1-3/4	.022
GMF22914	.024	3/16	1/32	5/32	1-3/4	.022
GMF22915	.024	3/16	1/32	3/16	1-3/4	.022
GMF22916	.024	3/16	1/32	1/4	1-3/4	.022
GMF22917	.024	3/16	1/32	5/16	1-3/4	.022
GMF22918	.024	3/16	1/32	3/8	1-3/4	.022
GMF22002	1/32	3/16	3/64	5/64	1-3/4	.029
GMF22919	1/32	3/16	3/64	1/8	1-3/4	.029
GMF22920	1/32	3/16	3/64	5/32	1-3/4	.029
GMF22921	1/32	3/16	3/64	3/16	1-3/4	.029
GMF22922	1/32	3/16	3/64	1/4	1-3/4	.029
GMF22923	1/32	3/16	3/64	5/16	1-3/4	.029
GMF22924	1/32	3/16	3/64	3/8	1-3/4	.029
GMF22003	3/64	3/16	1/16	1/8	2	.044
GMF22925	3/64	3/16	1/16	5/32	2	.044
GMF22926	3/64	3/16	1/16	3/16	2	.044
GMF22927	3/64	3/16	1/16	1/4	2	.044
GMF22928	3/64	3/16	1/16	5/16	2	.044

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

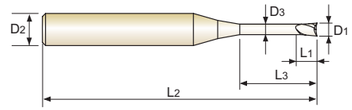
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF22** SERIES

CARBIDE, 2 FLUTE with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- Excellent for Rib Processing of various depths



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C347

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF22929	3/64	3/16	1/16	3/8	2	.044
GMF22930	3/64	3/16	1/16	1/2	2	.044
GMF22931	3/64	3/16	1/16	9/16	2	.044
GMF22932	3/64	3/16	1/16	5/8	2	.044
GMF22933	3/64	3/16	1/16	3/4	2	.044
GMF22004	1/16	3/16	3/32	5/32	2	.060
GMF22934	1/16	3/16	3/32	1/4	2	.060
GMF22935	1/16	3/16	3/32	5/16	2	.060
GMF22936	1/16	3/16	3/32	3/8	2	.060
GMF22937	1/16	3/16	3/32	1/2	2	.060
GMF22938	1/16	3/16	3/32	9/16	2	.060
GMF22939	1/16	3/16	3/32	5/8	2	.060
GMF22940	1/16	3/16	3/32	3/4	2	.060
GMF22005	5/64	3/16	1/8	1/4	2	.076
GMF22941	5/64	3/16	1/8	5/16	2	.076
GMF22942	5/64	3/16	1/8	3/8	2	.076
GMF22943	5/64	3/16	1/8	1/2	2	.076
GMF22944	5/64	3/16	1/8	9/16	2	.076
GMF22945	5/64	3/16	1/8	5/8	2	.076
GMF22946	5/64	3/16	1/8	3/4	2	.076
GMF22006	3/32	3/16	5/32	5/16	2	.089
GMF22947	3/32	3/16	5/32	1/2	2	.089
GMF22948	3/32	3/16	5/32	5/8	2	.089
GMF22949	3/32	3/16	5/32	3/4	2	.089
GMF22008	1/8	1/4	3/16	5/16	2	.119
GMF22950	1/8	1/4	3/16	3/8	2	.119
GMF22951	1/8	1/4	3/16	1/2	2	.119
GMF22952	1/8	1/4	3/16	9/16	2-3/8	.119
GMF22953	1/8	1/4	3/16	5/8	2-3/8	.119
GMF22954	1/8	1/4	3/16	11/16	2-3/8	.119

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

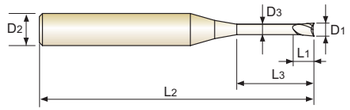
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF22 SERIES**

CARBIDE, 2 FLUTE with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- Excellent for Rib Processing of various depths



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C347

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF22955	1/8	1/4	3/16	3/4	2-3/8	.119
GMF22956	1/8	1/4	3/16	1	2-3/4	.119
GMF22012	3/16	1/4	1/4	3/8	2	.181
GMF22957	3/16	1/4	1/4	1/2	2	.181
GMF22958	3/16	1/4	1/4	5/8	2-3/8	.181
GMF22959	3/16	1/4	1/4	11/16	2-3/8	.181
GMF22960	3/16	1/4	1/4	3/4	2-3/8	.181
GMF22961	3/16	1/4	1/4	1	2-3/4	.181
GMF22962	3/16	1/4	1/4	1-3/16	2-3/4	.181
GMF22013	13/64	1/4	5/16	3/4	2-3/8	.197
GMF22963	13/64	1/4	5/16	1-3/16	2-3/4	.197
GMF22964	13/64	1/4	5/16	1-3/8	3	.197
GMF22965	13/64	1/4	5/16	1-1/2	3-1/8	.197
GMF22966	13/64	1/4	5/16	2	3-1/2	.197
GMF22016	1/4	1/4	3/8	5/8	2-3/8	.244
GMF22967	1/4	1/4	3/8	3/4	2-3/8	.244
GMF22968	1/4	1/4	3/8	1-3/16	2-3/4	.244
GMF22020	5/16	5/16	1/2	1	2-3/4	.300
GMF22024	3/8	3/8	5/8	1-3/16	3	.363
GMF22969	3/8	3/8	5/8	1-3/4	4	.363
GMF22032	1/2	1/2	3/4	1-3/8	3-1/8	.488
GMF22970	1/2	1/2	3/4	2	4-1/4	.488

Size	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	0~-.0005	h5
over Ø1/4	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

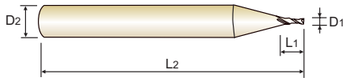
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF23 SERIES**

CARBIDE, 2 FLUTE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Sharp End tooth geometry allows more efficient cutting



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C353

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF23901	.004	3/16	.008	1-1/2
GMF23902	.008	3/16	1/64	1-1/2
GMF23903	.012	3/16	1/32	1-1/2
GMF23904	.015	3/16	1/32	1-1/2
GMF23905	.020	3/16	3/64	1-1/2
GMF23906	.024	3/16	3/64	1-1/2
GMF23907	.028	3/16	1/16	1-1/2
GMF23908	.031	3/16	1/16	1-1/2
GMF23909	.035	3/16	5/64	1-1/2
GMF23910	.040	1/4	3/32	2
GMF23911	.047	1/4	1/8	2
GMF23004	1/16	1/4	5/32	2
GMF23005	5/64	1/4	1/4	2
GMF23006	3/32	1/4	1/4	2
GMF23008	1/8	1/4	5/16	2
GMF23009	9/64	1/4	3/8	2
GMF23012	3/16	1/4	3/8	2
GMF23013	13/64	1/4	5/8	2-3/8
GMF23016	1/4	1/4	5/8	2-3/8
GMF23017	17/64	5/16	11/16	2-3/8
GMF23018	9/32	5/16	3/4	2-3/8
GMF23020	5/16	5/16	3/4	2-3/4
GMF23022	11/32	3/8	7/8	2-3/4
GMF23023	23/64	3/8	7/8	2-3/4
GMF23024	3/8	3/8	1	3
GMF23026	13/32	1/2	1	3
GMF23028	7/16	1/2	1-3/16	3
GMF23032	1/2	1/2	1-3/16	3-1/8
GMF23036	9/16	9/16	1-3/8	4
GMF23912	9/16	5/8	1-3/8	4
GMF23040	5/8	5/8	1-1/2	4
GMF23048	3/4	3/4	1-3/4	4

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

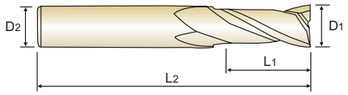
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF23 SERIES**

CARBIDE, 2 FLUTE (3/16 Shank)

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Sharp End tooth geometry allows more efficient cutting



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C353

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF23913	.040	3/16	3/32	2
GMF23914	.047	3/16	1/8	2
GMF23915	.050	3/16	1/8	2
GMF23916	.055	3/16	5/32	2
GMF23917	.060	3/16	5/32	2
GMF23918	.063	3/16	5/32	2
GMF23919	.070	3/16	3/16	2
GMF23920	.079	3/16	1/4	2
GMF23921	.087	3/16	1/4	2
GMF23922	.094	3/16	1/4	2
GMF23923	.098	3/16	5/16	2
GMF23924	.102	3/16	5/16	2
GMF23925	.106	3/16	5/16	2
GMF23926	.110	3/16	5/16	2
GMF23927	.120	3/16	5/16	2

▶ NEXT PAGE

Size	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	0~-.0005	h5
over Ø1/4	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

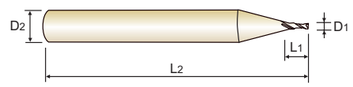
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF23 SERIES**

CARBIDE, 2 FLUTE (1/8 Shank)

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Sharp End tooth geometry allows more efficient cutting



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C353

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF23928	.004	1/8	.008	1-1/2
GMF23929	.008	1/8	1/64	1-1/2
GMF23930	.012	1/8	1/32	1-1/2
GMF23931	.015	1/8	1/32	1-1/2
GMF23932	.020	1/8	3/64	1-1/2
GMF23933	.024	1/8	3/64	1-1/2
GMF23934	.028	1/8	1/16	1-1/2
GMF23935	.031	1/8	1/16	1-1/2
GMF23936	.035	1/8	5/64	1-1/2
GMF23937	.040	1/8	3/32	2
GMF23938	.047	1/8	1/8	2
GMF23939	.060	1/8	5/32	2
GMF23940	.079	1/8	1/4	2
GMF23941	.098	1/8	1/4	2
GMF23942	.120	1/8	5/16	2

Size	Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
up to Ø1/4	0~-.0005	h5
over Ø1/4	0~-.0006	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

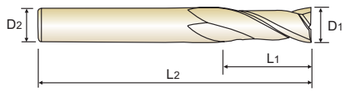
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF24** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C356

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF24003	3/64	1/4	1/8	2-3/8
GMF24901	3/64	1/4	5/32	2-3/8
GMF24902	3/64	1/4	1/4	2-3/8
GMF24903	3/64	1/4	5/16	2-3/8
GMF24904	3/64	1/4	3/8	2-3/8
GMF24004	1/16	1/4	1/4	2-3/8
GMF24905	1/16	1/4	5/16	2-3/8
GMF24906	1/16	1/4	3/8	2-3/8
GMF24907	1/16	1/4	1/2	2-3/8
GMF24908	1/16	1/4	5/8	2-3/8
GMF24005	5/64	1/4	5/16	2-3/8
GMF24909	5/64	1/4	3/8	2-3/8
GMF24910	5/64	1/4	1/2	2-3/8
GMF24911	5/64	1/4	5/8	2-3/8
GMF24006	3/32	1/4	5/8	2-3/8
GMF24008	1/8	1/4	3/8	2-3/4
GMF24912	1/8	1/4	1/2	2-3/4
GMF24913	1/8	1/4	5/8	2-3/4
GMF24914	1/8	1/4	3/4	2-3/4
GMF24915	1/8	1/4	1	2-3/4
GMF24012	3/16	1/4	1/2	2-3/4
GMF24916	3/16	1/4	5/8	2-3/4
GMF24917	3/16	1/4	3/4	2-3/4
GMF24918	3/16	1/4	1	2-3/4
GMF24919	3/16	1/4	1-3/16	2-3/4
GMF24013	13/64	1/4	3/4	2-3/4
GMF24920	13/64	1/4	1	2-3/4
GMF24921	13/64	1/4	1-3/16	3-1/8

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

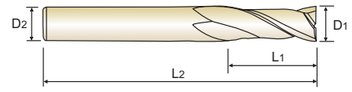
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF24** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C356

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF24922	13/64	1/4	1-1/2	4
GMF24016	1/4	1/4	5/8	2-3/8
GMF24923	1/4	1/4	5/8	3-1/8
GMF24924	1/4	1/4	3/4	2-3/4
GMF24925	1/4	1/4	3/4	3-1/2
GMF24926	1/4	1/4	1	3
GMF24927	1/4	1/4	1-3/16	3-1/8
GMF24928	1/4	1/4	1-3/16	4
GMF24929	1/4	1/4	1-3/16	6
GMF24930	1/4	1/4	1-3/8	3-1/2
GMF24931	1/4	1/4	1-1/2	3-1/2
GMF24932	1/4	1/4	1-3/4	6
GMF24020	5/16	5/16	1	3-1/8
GMF24933	5/16	5/16	1-3/16	3-1/8
GMF24934	5/16	5/16	1-3/8	3-1/2
GMF24935	5/16	5/16	1-1/2	3-1/2
GMF24936	5/16	5/16	1-1/2	4-1/2
GMF24937	5/16	5/16	1-3/4	4
GMF24938	5/16	5/16	2	4
GMF24024	3/8	3/8	1-3/16	3-1/8
GMF24939	3/8	3/8	1-3/16	4
GMF24940	3/8	3/8	1-3/8	3-1/2
GMF24941	3/8	3/8	1-1/2	3-1/2
GMF24942	3/8	3/8	1-1/2	4-1/2
GMF24943	3/8	3/8	1-3/4	4
GMF24944	3/8	3/8	2	4
GMF24945	3/8	3/8	2-3/8	4-1/4
GMF24032	1/2	1/2	1-3/8	3-1/2

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

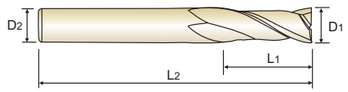
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF24** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C356

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF24946	1/2	1/2	1-1/2	4
GMF24947	1/2	1/2	1-1/2	4-1/2
GMF24948	1/2	1/2	1-3/4	5
GMF24949	1/2	1/2	2	4
GMF24950	1/2	1/2	2-1/8	4-1/4
GMF24951	1/2	1/2	2-3/8	4-1/4
GMF24952	1/2	1/2	2-3/8	6
GMF24040	5/8	5/8	1-1/2	6
GMF24048	3/4	3/4	3-1/2	8
GMF24953	3/4	3/4	4-1/4	8

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

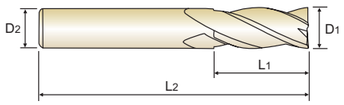
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF25** SERIES

CARBIDE, 4 FLUTE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration will be minimized and tool life increased.



CARBIDE | 4 | 27°/30° | PLAIN | Y Coating | p.C360

D1<Ø1/8, 30° Helix

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF25003	3/64	1/4	3/32	2
GMF25004	1/16	1/4	5/32	2
GMF25005	5/64	1/4	1/4	2
GMF25006	3/32	1/4	1/4	2
GMF25008	1/8	1/4	5/16	2
GMF25009	9/64	1/4	3/8	2
GMF25012	3/16	1/4	3/8	2
GMF25013	13/64	1/4	5/8	2-3/8
GMF25014	7/32	1/4	5/8	2-3/8
GMF25016	1/4	1/4	5/8	2-3/8
GMF25017	17/64	5/16	11/16	2-3/8
GMF25018	9/32	5/16	3/4	2-3/8
GMF25019	19/64	5/16	3/4	2-3/8
GMF25020	5/16	5/16	3/4	2-3/4
GMF25022	11/32	3/8	7/8	2-3/4
GMF25023	23/64	3/8	7/8	2-3/4
GMF25024	3/8	3/8	1	3
GMF25028	7/16	1/2	1-3/16	3
GMF25032	1/2	1/2	1-3/16	3-1/8
GMF25036	9/16	9/16	1-3/8	4
GMF25901	9/16	5/8	1-3/8	4
GMF25040	5/8	5/8	1-1/2	4
GMF25044	11/16	5/8	1-3/4	4
GMF25048	3/4	3/4	1-3/4	4

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

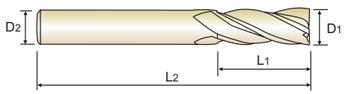
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF26** SERIES

CARBIDE, 4 FLUTE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8″and over diameter end mills, vibration will be minimized and tool life increased.
- Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
  Various length products Available



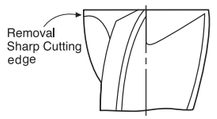
CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.C360

D1<Ø1/8, 30˚ Helix

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF26003	3/64	1/4	3/32	2
GMF26004	1/16	1/4	5/32	2
GMF26005	5/64	1/4	1/4	2
GMF26006	3/32	1/4	1/4	2
GMF26008	1/8	1/4	5/16	2
GMF26012	3/16	1/4	3/8	2
GMF26013	13/64	1/4	5/8	2-3/8
GMF26016	1/4	1/4	5/8	2-3/8
GMF26020	5/16	5/16	3/4	2-3/4
GMF26024	3/8	3/8	1	3
GMF26032	1/2	1/2	1-3/16	3-1/8
GMF26040	5/8	5/8	1-1/4	4
GMF26048	3/4	3/4	1-3/4	4

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

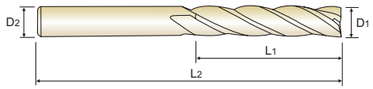
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF27** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Various length of cut and overall length products available



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C362

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF27003	3/64	1/4	1/8	2-3/8
GMF27901	3/64	1/4	5/32	2-3/8
GMF27902	3/64	1/4	3/16	2-3/8
GMF27903	3/64	1/4	1/4	2-3/8
GMF27004	1/16	1/4	1/4	2-3/8
GMF27005	5/64	1/4	5/16	2-3/8
GMF27904	5/64	1/4	3/8	2-3/8
GMF27905	5/64	1/4	1/2	2-3/8
GMF27906	5/64	1/4	9/16	2-3/8
GMF27006	3/32	1/4	3/8	2-3/8
GMF27907	3/32	1/4	1/2	2-3/8
GMF27008	1/8	1/4	3/8	2-3/4
GMF27908	1/8	1/4	1/2	2-3/4
GMF27909	1/8	1/4	5/8	2-3/4
GMF27910	1/8	1/4	3/4	2-3/4
GMF27911	1/8	1/4	1	2-3/4
GMF27912	1/8	1/4	1-3/16	2-3/4
GMF27012	3/16	1/4	1/2	2-3/4
GMF27913	3/16	1/4	5/8	2-3/4
GMF27914	3/16	1/4	3/4	2-3/4
GMF27915	3/16	1/4	1	2-3/4
GMF27916	3/16	1/4	1-3/16	2-3/4
GMF27013	13/64	1/4	3/4	2-3/4
GMF27917	13/64	1/4	1	2-3/4
GMF27918	13/64	1/4	1-3/16	3-1/8
GMF27016	1/4	1/4	5/8	2-3/8
GMF27919	1/4	1/4	3/4	2-3/4
GMF27920	1/4	1/4	3/4	3-1/2

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

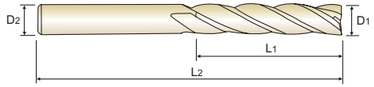
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF27 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Various length of cut and overall length products available



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C362

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF27921	1/4	1/4	1	3
GMF27922	1/4	1/4	1-3/16	3-1/8
GMF27923	1/4	1/4	1-3/16	4
GMF27924	1/4	1/4	1-3/8	3-1/2
GMF27925	1/4	1/4	1-1/2	3-1/2
GMF27926	1/4	1/4	1-1/2	4-1/2
GMF27927	1/4	1/4	1-3/4	6
GMF27020	5/16	5/16	1	3-1/8
GMF27928	5/16	5/16	1-3/16	3-1/8
GMF27929	5/16	5/16	1-3/8	3-1/2
GMF27930	5/16	5/16	1-1/2	3-1/2
GMF27931	5/16	5/16	1-3/4	4
GMF27932	5/16	5/16	2	4
GMF27933	5/16	5/16	2	6
GMF27024	3/8	3/8	1-3/16	3-1/8
GMF27934	3/8	3/8	1-3/16	4
GMF27935	3/8	3/8	1-3/8	3-1/2
GMF27936	3/8	3/8	1-1/2	3-1/2
GMF27937	3/8	3/8	1-3/4	4
GMF27938	3/8	3/8	2	4
GMF27032	1/2	1/2	1-3/8	3-1/2
GMF27939	1/2	1/2	1-1/2	4
GMF27940	1/2	1/2	1-3/4	5
GMF27941	1/2	1/2	2	4
GMF27942	1/2	1/2	2-1/8	4-1/4
GMF27943	1/2	1/2	2-3/8	4-1/4
GMF27944	1/2	1/2	2-3/8	6
GMF27036	9/16	5/8	2	4-1/4

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

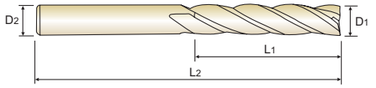
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF27 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Various length of cut and overall length products available



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C362

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF27040	5/8	5/8	2	4-1/4
GMF27945	5/8	5/8	2-3/8	4-1/2
GMF27946	5/8	5/8	2-3/4	5
GMF27947	5/8	5/8	2-3/4	6
GMF27048	3/4	3/4	2-3/8	5
GMF27948	3/4	3/4	3-1/2	8
GMF27064	1	1	3-1/2	6

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

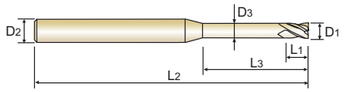
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF28 SERIES**

CARBIDE, 4 FLUTE with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Many more various effective lengths and overall lengths than previous standard products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C366

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF28003	3/64	3/16	1/16	5/32	2	.044
GMF28901	3/64	3/16	1/16	3/16	2	.044
GMF28902	3/64	3/16	1/16	1/4	2	.044
GMF28903	3/64	3/16	1/16	5/16	2	.044
GMF28004	1/16	3/16	3/32	1/4	2	.060
GMF28904	1/16	3/16	3/32	5/16	2	.060
GMF28905	1/16	3/16	3/32	3/8	2	.060
GMF28906	1/16	3/16	3/32	1/2	2	.060
GMF28907	1/16	3/16	3/32	5/8	2	.060
GMF28005	5/64	3/16	1/8	5/16	2	.076
GMF28908	5/64	3/16	1/8	3/8	2	.076
GMF28909	5/64	3/16	1/8	1/2	2	.076
GMF28910	5/64	3/16	1/8	5/8	2	.076
GMF28008	1/8	1/4	3/16	3/8	2	.119
GMF28911	1/8	1/4	3/16	1/2	2	.119
GMF28912	1/8	1/4	3/16	5/8	2-3/8	.119
GMF28913	1/8	1/4	3/16	3/4	2-3/8	.119
GMF28914	1/8	1/4	3/16	1-3/16	2-3/4	.119
GMF28012	3/16	1/4	1/4	1/2	2	.181
GMF28915	3/16	1/4	1/4	5/8	2-3/8	.181
GMF28916	3/16	1/4	1/4	3/4	2-3/8	.181
GMF28917	3/16	1/4	1/4	1-3/16	2-3/4	.181
GMF28918	3/16	1/4	1/4	1-1/2	3-1/8	.181
GMF28013	13/64	1/4	5/16	3/4	2-3/8	.197
GMF28919	13/64	1/4	5/16	1-1/2	3-1/8	.197
GMF28016	1/4	1/4	3/8	5/8	2-3/8	.244
GMF28920	1/4	1/4	3/8	1-3/16	2-3/4	.244
GMF28020	5/16	5/16	1/2	1	2-3/4	.300

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **GMF28 SERIES**

CARBIDE, 4 FLUTE with NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
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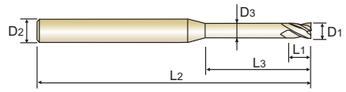
- Many more various effective lengths and overall lengths than previous standard products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C366

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GMF28921	5/16	5/16	1/2	1-5/8	4	.300
GMF28024	3/8	3/8	5/8	1-3/16	3	.363
GMF28922	3/8	3/8	5/8	1-3/4	4	.363
GMF28032	1/2	1/2	3/4	1-3/8	3-1/8	.488
GMF28923	1/2	1/2	3/4	2	4-1/4	.488

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

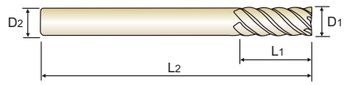
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **GMF29 SERIES**

CARBIDE, 6 FLUTE 45° HELIX

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to 45 helix angle, better surface finish can be achieved when side cutting.
- Various effective length and overall length products.



CARBIDE | 6 | 45° | PLAIN | Y Coating | p.C368

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GMF29016	1/4	1/4	5/8	2-3/8
GMF29901	1/4	1/4	1-3/16	3-1/8
GMF29020	5/16	5/16	3/4	2-3/4
GMF29902	5/16	5/16	1-1/2	3-1/2
GMF29024	3/8	3/8	1	3
GMF29903	3/8	3/8	1-1/2	3-1/2
GMF29032	1/2	1/2	1-3/16	3-1/8
GMF29904	1/2	1/2	2	4
GMF29040	5/8	5/8	1-1/2	4
GMF29905	5/8	5/8	2-3/8	4-1/2
GMF29048	3/4	3/4	1-3/4	4
GMF29906	3/4	3/4	2-3/8	4-1/2

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.0012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended									○	○								○		◎	○

4G MILL END MILLS

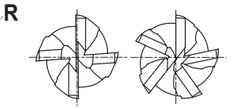
X-SPEED ROUGHER

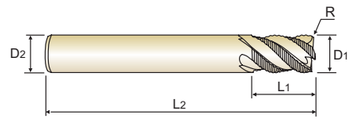
PLAIN SHANK **G907 SERIES**

FLAT SHANK **G928 SERIES**

CARBIDE, 4&5 FLUTE STUB LENGTH ROUGHING CORNER RADIUS - FINE

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.





CARBIDE | 4&5 | 44°/45° | PLAIN | FLAT | X Coating | p.C370

5 Flute, 44°/44.5°/45°

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
G90716	-	R.020	1/4	1/4	3/8	2	4
G90720	-	R.020	5/16	5/16	7/16	2	4
G90724	G92824	R.020	3/8	3/8	1/2	2-1/4	4
G90732	G92832	R.020	1/2	1/2	5/8	2-1/2	4
G90740	G92840	R.040	5/8	5/8	3/4	3	5
G90748	G92848	R.040	3/4	3/4	1	3-1/4	5
G90764	G92864	R.040	1	1	1-1/4	4	5

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.002	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												◎	

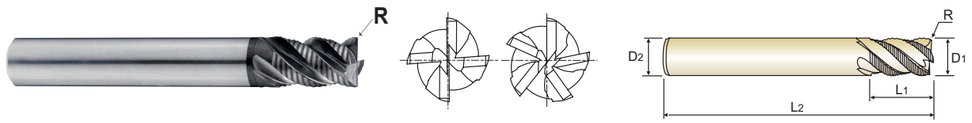
4G MILL END MILLS

X-SPEED ROUGHER

PLAIN SHANK **G908** SERIES
FLAT SHANK **G929** SERIES

CARBIDE, 4&5 FLUTE REGULAR LENGTH ROUGHING CORNER RADIUS - FINE

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to all ng tool life and excellent chip evacuation.



CARBIDE | 4&5 | 44°/45° | PLAIN | FLAT | X Coating

p.C370

5 Flute, 44°/44.5°/45°

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
G90816	-	R.020	**1/4**	1/4	5/8	2-1/2	4
G90820	-	R.020	**5/16**	5/16	3/4	2-1/2	4
G90824	**G92924**	R.020	**3/8**	3/8	7/8	2-1/2	4
G90832	**G92932**	R.020	**1/2**	1/2	1	3	4
G90840	**G92940**	R.040	**5/8**	5/8	1-1/4	3-1/2	5
G90848	**G92948**	R.040	**3/4**	3/4	1-5/8	4	5
G90864	**G92964**	R.040	**1**	1	1-3/4	4-1/4	5

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.002	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												◎	

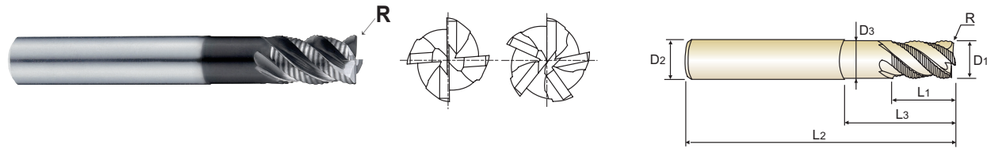
4G MILL END MILLS

X-SPEED ROUGHER

PLAIN SHANK **G909** SERIES
FLAT SHANK **G930** SERIES

CARBIDE, MULTI FLUTE EXTENDED REACH ROUGHING CORNER RADIUS - FINE

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.



CARBIDE | 4&5 | 44°/45° | PLAIN | FLAT | X Coating

p.C370

5 Flute, 44°/44.5°/45°

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	No. of Flute
G90916	-	R.020	**1/4**	1/4	3/8	7/8	2-1/2	.230	4
G90920	-	R.020	**5/16**	5/16	7/16	1	2-1/2	.292	4
G90924	**G93024**	R.020	**3/8**	3/8	1/2	1	2-3/4	.355	4
G90932	**G93032**	R.020	**1/2**	1/2	5/8	1-1/4	3-1/4	.480	4
G90940	**G93040**	R.040	**5/8**	5/8	3/4	2	4	.605	5
G90948	**G93048**	R.040	**3/4**	3/4	1	2-3/8	4-1/2	.718	5

Mill Dia. Tolerance (Inch)	Shank Dia. Tolerance
0~-.002	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

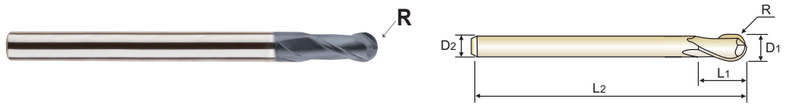
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												◎	

4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN | Y Coating | p.C372

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD98001S	R0.05	0.1	4	0.1	40	Short
SEMD98001	R0.05	0.1	4	0.2	40	Regular
SEMD980013S	R0.05	0.1	3	0.2	40	3mm Shank
SEMD980015S	R0.075	0.15	4	0.15	40	Short
SEMD980015	R0.075	0.15	4	0.3	40	Regular
SEMD9800153S	R0.075	0.15	3	0.3	40	3mm Shank
SEMD98002S	R0.1	0.2	4	0.2	40	Short
SEMD98002	R0.1	0.2	4	0.4	40	Regular
SEMD980023S	R0.1	0.2	3	0.4	40	3mm Shank
SEMD98003S	R0.15	0.3	4	0.3	40	Short
SEMD98003	R0.15	0.3	4	0.6	40	Regular
SEMD980033S	R0.15	0.3	3	0.6	40	3mm Shank
SEMD98004S	R0.2	0.4	4	0.4	40	Short
SEMD98004	R0.2	0.4	4	0.8	40	Regular
SEMD980043S	R0.2	0.4	3	0.8	40	3mm Shank
SEMD98005S	R0.25	0.5	4	0.5	40	Short
SEMD98005	R0.25	0.5	4	1.0	40	Regular
SEMD980053S	R0.25	0.5	3	1.0	40	3mm Shank
SEMD98006S	R0.3	0.6	4	0.6	40	Short
SEMD98006	R0.3	0.6	4	1.2	40	Regular
SEMD980063S	R0.3	0.6	3	1.2	40	3mm Shank
SEMD98007S	R0.35	0.7	4	0.7	40	Short
SEMD98007	R0.35	0.7	4	1.4	40	Regular
SEMD980073S	R0.35	0.7	3	1.4	40	3mm Shank
SEMD98008S	R0.4	0.8	4	0.8	40	Short
SEMD98008	R0.4	0.8	4	1.6	40	Regular
SEMD980083S	R0.4	0.8	3	1.6	40	3mm Shank
SEMD98009S	R0.45	0.9	4	0.9	40	Short

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

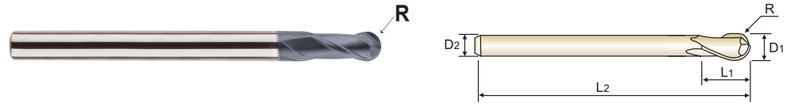
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN | Y Coating | p.C372

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD98009	R0.45	0.9	4	1.8	40	Regular
SEMD980093S	R0.45	0.9	3	1.8	40	3mm Shank
SEMD98010040	R0.5	1.0	6	1.5	40	Short
SEMD980103S	R0.5	1.0	3	2.5	50	3mm Shank
SEMD980104S	R0.5	1.0	4	2.5	50	Regular
SEMD98010	R0.5	1.0	6	2.5	50	Regular
SEMD98010070	R0.5	1.0	6	2.5	70	Long Shank
SEMD98010100	R0.5	1.0	6	2.5	100	Long Shank
SEMD98012040	R0.6	1.2	6	2	40	Short
SEMD980123S	R0.6	1.2	3	3	50	3mm Shank
SEMD980124S	R0.6	1.2	4	3	50	Regular
SEMD98012	R0.6	1.2	6	3	50	Regular
SEMD98012070	R0.6	1.2	6	3	70	Long Shank
SEMD98012100	R0.6	1.2	6	3	100	Long Shank
SEMD98015040	R0.75	1.5	6	2.5	40	Short
SEMD980153S	R0.75	1.5	3	4	50	3mm Shank
SEMD980154S	R0.75	1.5	4	4	50	Regular
SEMD98015	R0.75	1.5	6	4	50	Regular
SEMD98015070	R0.75	1.5	6	4	70	Long Shank
SEMD98015100	R0.75	1.5	6	4	100	Long Shank
SEMD98020040	R1.0	2.0	6	3	40	Short
SEMD980203S	R1.0	2.0	3	5	50	3mm Shank
SEMD980204S	R1.0	2.0	4	5	50	Regular
SEMD98020	R1.0	2.0	6	5	50	Regular
SEMD98020080	R1.0	2.0	6	5	80	Long Shank
SEMD98020100	R1.0	2.0	6	5	100	Long Shank
SEMD98025040	R1.25	2.5	6	4	40	Short
SEMD980253S	R1.25	2.5	3	6	60	3mm Shank

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

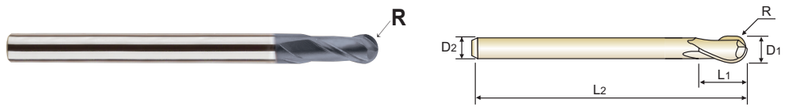
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 R≤3 | R ±0.010 R>3 | PLAIN | Y Coating

p.C372

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD980254S	R1.25	2.5	4	6	60	Regular
SEMD98025	R1.25	2.5	6	6	60	Regular
SEMD98025080	R1.25	2.5	6	6	80	Long Shank
SEMD98025100	R1.25	2.5	6	6	100	Long Shank
SEMD98030040	R1.5	3.0	6	4.5	40	Short
SEMD980303S	R1.5	3.0	3	6	60	3mm Shank
SEMD980304S	R1.5	3.0	4	6	60	Regular
SEMD98030	R1.5	3.0	6	6	60	Regular
SEMD98030080	R1.5	3.0	6	6	80	Long Shank
SEMD98030100	R1.5	3.0	6	6	100	Long Shank
SEMD98035	R1.75	3.5	6	8	70	-
SEMD98040050	R2.0	4.0	6	6	50	Short
SEMD980404S	R2.0	4.0	4	8	70	Regular
SEMD98040	R2.0	4.0	6	8	70	Regular
SEMD980401004S	R2.0	4.0	4	8	100	Long Shank
SEMD980401204S	R2.0	4.0	4	8	120	Long Shank
SEMD98040100	R2.0	4.0	6	8	100	Long Shank
SEMD98040120	R2.0	4.0	6	8	120	Long Shank
SEMD98045	R2.25	4.5	6	9	80	-
SEMD98050060	R2.5	5.0	6	7.5	60	Short
SEMD98050	R2.5	5.0	6	10	80	Regular
SEMD980505S	R2.5	5.0	5	10	80	5mmShank
SEMD98055	R2.75	5.5	6	11	90	-
SEMD98060050	R3.0	6.0	6	9	50	Short
SEMD98060060	R3.0	6.0	6	9	60	Short
SEMD98060080	R3.0	6.0	6	9	80	Short
SEMD98060	R3.0	6.0	6	12	90	Regular
SEMD98060110	R3.0	6.0	6	12	110	Long Shank

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

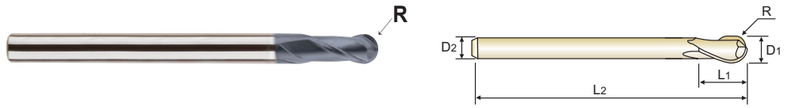
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 R≤3 | R ±0.010 R>3 | PLAIN | Y Coating

p.C372

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD98060130	R3.0	6.0	6	12	130	Long Shank
SEMD98060150	R3.0	6.0	6	12	150	Long Shank
SEMD98065	R3.25	6.5	8	13	90	-
SEMD98070	R3.5	7.0	8	14	90	-
SEMD98080050	R4.0	8.0	8	12	50	Short
SEMD98080060	R4.0	8.0	8	12	60	Short
SEMD98080080	R4.0	8.0	8	12	80	Short
SEMD98080090	R4.0	8.0	8	12	90	Short
SEMD98080	R4.0	8.0	8	14	100	Regular
SEMD98080130	R4.0	8.0	8	14	130	Long Shank
SEMD98080150	R4.0	8.0	8	14	150	Long Shank
SEMD98085	R4.25	8.5	10	16	100	-
SEMD98090	R4.5	9.0	10	18	100	-
SEMD98100050	R5.0	10.0	10	15	50	Short
SEMD98100060	R5.0	10.0	10	15	60	Short
SEMD98100080	R5.0	10.0	10	15	80	Short
SEMD98100090	R5.0	10.0	10	15	90	Short
SEMD98100	R5.0	10.0	10	18	100	Regular
SEMD98100130	R5.0	10.0	10	18	130	Long Shank
SEMD98100150	R5.0	10.0	10	18	150	Long Shank
SEMD98100180	R5.0	10.0	10	18	180	Long Shank
SEMD98100200	R5.0	10.0	10	18	200	Long Shank
SEMD98110	R5.5	11.0	12	20	100	-
SEMD98120060	R6.0	12.0	12	18	60	Short
SEMD98120080	R6.0	12.0	12	18	80	Short
SEMD98120090	R6.0	12.0	12	18	90	Short
SEMD98120100	R6.0	12.0	12	18	100	Short
SEMD98120	R6.0	12.0	12	22	110	Regular

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

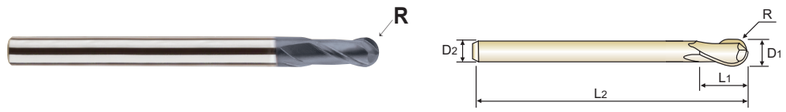
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEMD98** SERIES

CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN | Y Coating

p.C372

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD98120130	R6.0	**12.0**	12	22	130	Long Shank
SEMD98120150	R6.0	**12.0**	12	22	150	Long Shank
SEMD98120180	R6.0	**12.0**	12	22	180	Long Shank
SEMD98120220	R6.0	**12.0**	12	22	200	Long Shank
SEMD98130	R6.5	**13.0**	12	24	100	-
SEMD98140	R7.0	**14.0**	12	26	100	Regular
SEMD9814014S	R7.0	**14.0**	14	26	100	-
SEMD9814016S	R7.0	**14.0**	16	26	100	-
SEMD98150	R7.5	**15.0**	16	28	140	-
SEMD98160100	R8.0	**16.0**	16	24	100	Short
SEMD98160130	R8.0	**16.0**	16	24	130	Short
SEMD98160	R8.0	**16.0**	16	30	150	Regular
SEMD98160180	R8.0	**16.0**	16	30	180	Long Shank
SEMD98160200	R8.0	**16.0**	16	30	200	Long Shank
SEMD98180	R9.0	**18.0**	16	34	150	Regular
SEMD9818018S	R9.0	**18.0**	18	34	150	-
SEMD98200100	R10.0	**20.0**	20	30	100	Short
SEMD98200130	R10.0	**20.0**	20	30	130	Short
SEMD98200	R10.0	**20.0**	20	38	150	Regular
SEMD98200200	R10.0	**20.0**	20	38	200	Long Shank
SEMD98250120	R12.5	**25.0**	25	50	120	Short
SEMD98250	R12.5	**25.0**	25	50	180	Regular

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0~-0.012	h5
over R3	±0.010	0~-0.015	

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

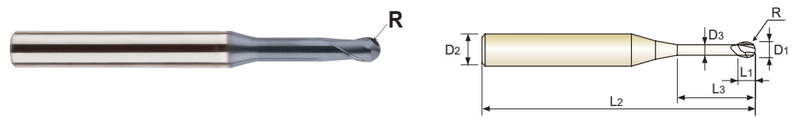
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN | Y Coating

p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM846001002	R0.05	**0.1**	4	0.1	0.2	40	0.085
SEM846001003	R0.05	**0.1**	4	0.1	0.3	40	0.085
SEM846001005	R0.05	**0.1**	4	0.1	0.5	40	0.085
SEM84600101	R0.05	**0.1**	4	0.1	1	40	0.085
SEM846002005	R0.1	**0.2**	4	0.2	0.5	40	0.17
SEM84600201	R0.1	**0.2**	4	0.2	1	40	0.17
SEM846002015	R0.1	**0.2**	4	0.2	1.5	40	0.17
SEM84600202	R0.1	**0.2**	4	0.2	2	40	0.17
SEM84600203	R0.1	**0.2**	4	0.2	3	40	0.17
SEM84600301	R0.15	**0.3**	4	0.3	1	40	0.27
SEM846003015	R0.15	**0.3**	4	0.3	1.5	40	0.27
SEM84600302	R0.15	**0.3**	4	0.3	2	40	0.27
SEM846003025	R0.15	**0.3**	4	0.3	2.5	40	0.27
SEM84600303	R0.15	**0.3**	4	0.3	3	40	0.27
SEM84600304	R0.15	**0.3**	4	0.3	4	40	0.27
SEM84600305	R0.15	**0.3**	4	0.3	5	40	0.27
SEM84600401	R0.2	**0.4**	4	0.4	1	40	0.37
SEM846004015	R0.2	**0.4**	4	0.4	1.5	40	0.37
SEM84600402	R0.2	**0.4**	4	0.4	2	40	0.37
SEM846004025	R0.2	**0.4**	4	0.4	2.5	40	0.37
SEM84600403	R0.2	**0.4**	4	0.4	3	40	0.37
SEM84600404	R0.2	**0.4**	4	0.4	4	40	0.37
SEM84600405	R0.2	**0.4**	4	0.4	5	40	0.37
SEM84600406	R0.2	**0.4**	4	0.4	6	40	0.37
SEM84600408	R0.2	**0.4**	4	0.4	8	40	0.37
SEM84600410	R0.2	**0.4**	4	0.4	10	40	0.37
SEM84600501	R0.25	**0.5**	4	0.5	1	45	0.45
SEM846005015	R0.25	**0.5**	4	0.5	1.5	45	0.45

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

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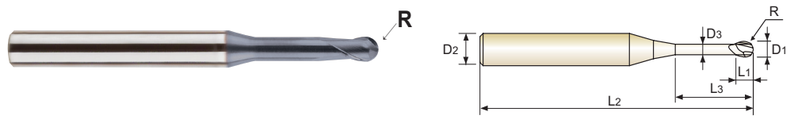


CARBIDE | 2 | 30° | R ±0.005 R≤3 | R ±0.010 R>3 | PLAIN | Y Coating

p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84600502	R0.25	0.5	4	0.5	2	45	0.45
SEM846005025	R0.25	0.5	4	0.5	2.5	45	0.45
SEM84600503	R0.25	0.5	4	0.5	3	45	0.45
SEM84600504	R0.25	0.5	4	0.5	4	45	0.45
SEM84600505	R0.25	0.5	4	0.5	5	45	0.45
SEM84600506	R0.25	0.5	4	0.5	6	45	0.45
SEM84600508	R0.25	0.5	4	0.5	8	45	0.45
SEM84600510	R0.25	0.5	4	0.5	10	45	0.45
SEM84600512	R0.25	0.5	4	0.5	12	45	0.45
SEM84600514	R0.25	0.5	4	0.5	14	45	0.45
SEM84600516	R0.25	0.5	4	0.5	16	45	0.45
SEM84600601	R0.3	0.6	4	0.6	1	45	0.55
SEM84600602	R0.3	0.6	4	0.6	2	45	0.55
SEM84600603	R0.3	0.6	4	0.6	3	45	0.55
SEM84600604	R0.3	0.6	4	0.6	4	45	0.55
SEM84600605	R0.3	0.6	4	0.6	5	45	0.55
SEM84600606	R0.3	0.6	4	0.6	6	45	0.55
SEM84600608	R0.3	0.6	4	0.6	8	45	0.55
SEM84600610	R0.3	0.6	4	0.6	10	45	0.55
SEM84600612	R0.3	0.6	4	0.6	12	45	0.55
SEM84600614	R0.3	0.6	4	0.6	14	45	0.55
SEM84600616	R0.3	0.6	4	0.6	16	45	0.55
SEM84600702	R0.35	0.7	4	0.7	2	45	0.65
SEM84600704	R0.35	0.7	4	0.7	4	45	0.65
SEM84600706	R0.35	0.7	4	0.7	6	45	0.65
SEM84600708	R0.35	0.7	4	0.7	8	45	0.65
SEM84600710	R0.35	0.7	4	0.7	10	45	0.65
SEM84600712	R0.35	0.7	4	0.7	12	45	0.65

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

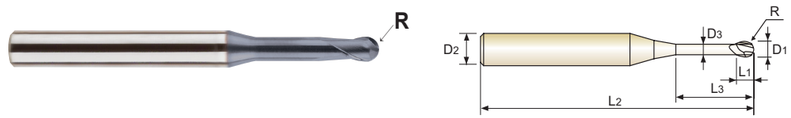
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 R≤3 | R ±0.010 R>3 | PLAIN | Y Coating

p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84600801	R0.4	0.8	4	0.8	1	45	0.75
SEM84600802	R0.4	0.8	4	0.8	2	45	0.75
SEM84600803	R0.4	0.8	4	0.8	3	45	0.75
SEM84600804	R0.4	0.8	4	0.8	4	45	0.75
SEM84600805	R0.4	0.8	4	0.8	5	45	0.75
SEM84600806	R0.4	0.8	4	0.8	6	45	0.75
SEM84600808	R0.4	0.8	4	0.8	8	45	0.75
SEM84600810	R0.4	0.8	4	0.8	10	45	0.75
SEM84600812	R0.4	0.8	4	0.8	12	45	0.75
SEM84600814	R0.4	0.8	4	0.8	14	45	0.75
SEM84600816	R0.4	0.8	4	0.8	16	45	0.75
SEM84600820	R0.4	0.8	4	0.8	20	45	0.75
SEM84600904	R0.45	0.9	4	0.9	4	45	0.85
SEM84600906	R0.45	0.9	4	0.9	6	45	0.85
SEM84600908	R0.45	0.9	4	0.9	8	45	0.85
SEM84600910	R0.45	0.9	4	0.9	10	45	0.85
SEM84601002	R0.5	1.0	4	1	2	50	0.95
SEM84601003	R0.5	1.0	4	1	3	50	0.95
SEM84601004	R0.5	1.0	4	1	4	50	0.95
SEM84601005	R0.5	1.0	4	1	5	50	0.95
SEM84601006	R0.5	1.0	4	1	6	50	0.95
SEM84601007	R0.5	1.0	4	1	7	50	0.95
SEM84601008	R0.5	1.0	4	1	8	50	0.95
SEM84601009	R0.5	1.0	4	1	9	50	0.95
SEM84601010	R0.5	1.0	4	1	10	50	0.95
SEM84601012	R0.5	1.0	4	1	12	50	0.95
SEM84601014	R0.5	1.0	4	1	14	50	0.95
SEM84601016	R0.5	1.0	4	1	16	50	0.95

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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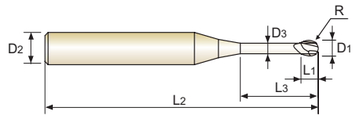

CARBIDE | 2 | 30° | R ±0.005 R≤3 | R ±0.010 R>3 | PLAIN | Y Coating

p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84601018	R0.5	1.0	4	1	18	50	0.95
SEM84601020	R0.5	1.0	4	1	20	50	0.95
SEM84601022	R0.5	1.0	4	1	22	60	0.95
SEM84601026	R0.5	1.0	4	1	26	60	0.95
SEM84601030	R0.5	1.0	4	1	30	70	0.95
SEM84601040	R0.5	1.0	4	1	40	80	0.95
SEM84601050	R0.5	1.0	4	1	50	100	0.95
SEM84601204	R0.6	1.2	4	1.2	4	50	1.15
SEM84601206	R0.6	1.2	4	1.2	6	50	1.15
SEM84601208	R0.6	1.2	4	1.2	8	50	1.15
SEM84601210	R0.6	1.2	4	1.2	10	50	1.15
SEM84601212	R0.6	1.2	4	1.2	12	50	1.15
SEM84601216	R0.6	1.2	4	1.2	16	50	1.15
SEM84601220	R0.6	1.2	4	1.2	20	50	1.15
SEM84601226	R0.6	1.2	4	1.2	26	60	1.15
SEM84601406	R0.7	1.4	4	1.4	6	50	1.35
SEM84601408	R0.7	1.4	4	1.4	8	50	1.35
SEM84601410	R0.7	1.4	4	1.4	10	50	1.35
SEM84601412	R0.7	1.4	4	1.4	12	50	1.35
SEM84601416	R0.7	1.4	4	1.4	16	50	1.35
SEM84601503	R0.75	1.5	4	1.5	3	50	1.45
SEM84601504	R0.75	1.5	4	1.5	4	50	1.45
SEM84601505	R0.75	1.5	4	1.5	5	50	1.45
SEM84601506	R0.75	1.5	4	1.5	6	50	1.45
SEM84601507	R0.75	1.5	4	1.5	7	50	1.45
SEM84601508	R0.75	1.5	4	1.5	8	50	1.45
SEM84601510	R0.75	1.5	4	1.5	10	50	1.45
SEM84601512	R0.75	1.5	4	1.5	12	50	1.45

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK SEM846 SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

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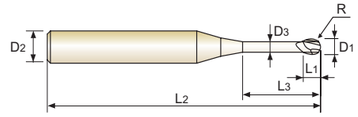

CARBIDE | 2 | 30° | R ±0.005 R≤3 | R ±0.010 R>3 | PLAIN | Y Coating

p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
SEM84601514	R0.75	1.5	4	1.5	14	50	1.45
SEM84601516	R0.75	1.5	4	1.5	16	50	1.45
SEM84601518	R0.75	1.5	4	1.5	18	50	1.45
SEM84601520	R0.75	1.5	4	1.5	20	50	1.45
SEM84601522	R0.75	1.5	4	1.5	22	60	1.45
SEM84601526	R0.75	1.5	4	1.5	26	60	1.45
SEM84601530	R0.75	1.5	4	1.5	30	70	1.45
SEM84601535	R0.75	1.5	4	1.5	35	70	1.45
SEM84601540	R0.75	1.5	4	1.5	40	80	1.45
SEM84601604	R0.8	1.6	4	1.6	4	50	1.55
SEM84601606	R0.8	1.6	4	1.6	6	50	1.55
SEM84601608	R0.8	1.6	4	1.6	8	50	1.55
SEM84601610	R0.8	1.6	4	1.6	10	50	1.55
SEM84601612	R0.8	1.6	4	1.6	12	50	1.55
SEM84601616	R0.8	1.6	4	1.6	16	50	1.55
SEM84601620	R0.8	1.6	4	1.6	20	50	1.55
SEM84601804	R0.9	1.8	4	1.8	4	50	1.75
SEM84601806	R0.9	1.8	4	1.8	6	50	1.75
SEM84601808	R0.9	1.8	4	1.8	8	50	1.75
SEM84601810	R0.9	1.8	4	1.8	10	50	1.75
SEM84601812	R0.9	1.8	4	1.8	12	50	1.75
SEM84601816	R0.9	1.8	4	1.8	16	50	1.75
SEM84601820	R0.9	1.8	4	1.8	20	50	1.75
SEM84602004	R1.0	2.0	4	2	4	50	1.95
SEM84602006	R1.0	2.0	4	2	6	50	1.95
SEM84602008	R1.0	2.0	4	2	8	50	1.95
SEM84602010	R1.0	2.0	4	2	10	50	1.95
SEM84602012	R1.0	2.0	4	2	12	50	1.95

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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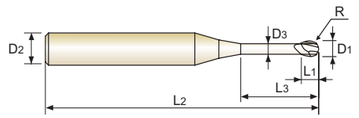

CARBIDE | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN | Y Coating

p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84602014	R1.0	2.0	4	2	14	50	1.95
SEM84602016	R1.0	2.0	4	2	16	50	1.95
SEM84602018	R1.0	2.0	4	2	18	50	1.95
SEM84602020	R1.0	2.0	4	2	20	50	1.95
SEM84602022	R1.0	2.0	4	2	22	60	1.95
SEM84602026	R1.0	2.0	4	2	26	60	1.95
SEM84602030	R1.0	2.0	4	2	30	70	1.95
SEM84602035	R1.0	2.0	4	2	35	70	1.95
SEM84602040	R1.0	2.0	4	2	40	80	1.95
SEM84602045	R1.0	2.0	4	2	45	90	1.95
SEM84602050	R1.0	2.0	4	2	50	100	1.95
SEM84602060	R1.0	2.0	4	2	60	110	1.95
SEM84602508	R1.25	2.5	4	2.5	8	50	2.40
SEM84602510	R1.25	2.5	4	2.5	10	50	2.40
SEM84602512	R1.25	2.5	4	2.5	12	50	2.40
SEM84602516	R1.25	2.5	4	2.5	16	50	2.40
SEM84602520	R1.25	2.5	4	2.5	20	50	2.40
SEM84602522	R1.25	2.5	4	2.5	22	60	2.40
SEM84602526	R1.25	2.5	4	2.5	26	60	2.40
SEM84602530	R1.25	2.5	4	2.5	30	70	2.40
SEM84602535	R1.25	2.5	4	2.5	35	70	2.40
SEM84602540	R1.25	2.5	4	2.5	40	80	2.40
SEM84602545	R1.25	2.5	4	2.5	45	90	2.40
SEM84602550	R1.25	2.5	4	2.5	50	100	2.40
SEM84603006	R1.5	3.0	6	3	6	50	2.85
SEM84603008	R1.5	3.0	6	3	8	50	2.85
SEM84603010	R1.5	3.0	6	3	10	50	2.85
SEM84603012	R1.5	3.0	6	3	12	50	2.85

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

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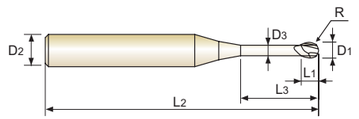


CARBIDE | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN | Y Coating

p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84603014	R1.5	3.0	6	3	14	60	2.85
SEM84603016	R1.5	3.0	6	3	16	60	2.85
SEM84603018	R1.5	3.0	6	3	18	60	2.85
SEM84603020	R1.5	3.0	6	3	20	60	2.85
SEM84603022	R1.5	3.0	6	3	22	65	2.85
SEM84603026	R1.5	3.0	6	3	26	65	2.85
SEM84603030	R1.5	3.0	6	3	30	70	2.85
SEM84603035	R1.5	3.0	6	3	35	70	2.85
SEM84603040	R1.5	3.0	6	3	40	80	2.85
SEM84603045	R1.5	3.0	6	3	45	90	2.85
SEM84603050	R1.5	3.0	6	3	50	100	2.85
SEM84603060	R1.5	3.0	6	3	60	100	2.85
SEM84604008	R2.0	4.0	6	4	8	50	3.85
SEM84604010	R2.0	4.0	6	4	10	50	3.85
SEM84604012	R2.0	4.0	6	4	12	50	3.85
SEM84604014	R2.0	4.0	6	4	14	60	3.85
SEM84604016	R2.0	4.0	6	4	16	60	3.85
SEM84604018	R2.0	4.0	6	4	18	60	3.85
SEM84604020	R2.0	4.0	6	4	20	60	3.85
SEM84604022	R2.0	4.0	6	4	22	65	3.85
SEM84604026	R2.0	4.0	6	4	26	65	3.85
SEM84604030	R2.0	4.0	6	4	30	70	3.85
SEM84604035	R2.0	4.0	6	4	35	70	3.85
SEM84604040	R2.0	4.0	6	4	40	80	3.85
SEM84604045	R2.0	4.0	6	4	45	90	3.85
SEM84604050	R2.0	4.0	6	4	50	100	3.85
SEM84604055	R2.0	4.0	6	4	55	100	3.85
SEM84604060	R2.0	4.0	6	4	60	100	3.85

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

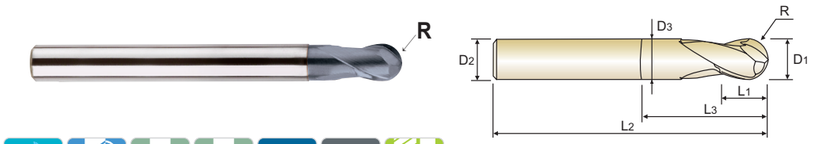
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN | Y Coating | p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84605015	R2.5	**5.0**	6	6	15	60	4.85
SEM84605020	R2.5	**5.0**	6	6	20	60	4.85
SEM84605026	R2.5	**5.0**	6	6	26	65	4.85
SEM84605030	R2.5	**5.0**	6	6	30	70	4.85
SEM84605035	R2.5	**5.0**	6	6	35	70	4.85
SEM84605040	R2.5	**5.0**	6	6	40	80	4.85
SEM84605045	R2.5	**5.0**	6	6	45	90	4.85
SEM84605050	R2.5	**5.0**	6	6	50	100	4.85
SEM84605055	R2.5	**5.0**	6	6	55	100	4.85
SEM84605060	R2.5	**5.0**	6	6	60	100	4.85
SEM84606020	R3.0	**6.0**	6	8	20	60	5.85
SEM84606030	R3.0	**6.0**	6	8	30	60	5.85
SEM84606020090	R3.0	**6.0**	6	12	20	90	5.85
SEM84606030090	R3.0	**6.0**	6	12	30	90	5.85
SEM84608025	R4.0	**8.0**	8	10	25	70	7.70
SEM84608035	R4.0	**8.0**	8	10	35	70	7.70
SEM84608025100	R4.0	**8.0**	8	14	25	100	7.70
SEM84608035100	R4.0	**8.0**	8	14	35	100	7.70
SEM84610030	R5.0	**10.0**	10	12	30	75	9.70
SEM84610040	R5.0	**10.0**	10	12	40	75	9.70
SEM84610030100	R5.0	**10.0**	10	18	30	100	9.70
SEM84610040100	R5.0	**10.0**	10	18	40	100	9.70
SEM84612032	R6.0	**12.0**	12	14	32	80	11.70
SEM84612045	R6.0	**12.0**	12	14	45	80	11.70
SEM84612032110	R6.0	**12.0**	12	22	32	110	11.70
SEM84612045110	R6.0	**12.0**	12	22	45	110	11.70

Size	Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to R3	±0.005	0~-0.012	h5
over R3	±0.010	0~-0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

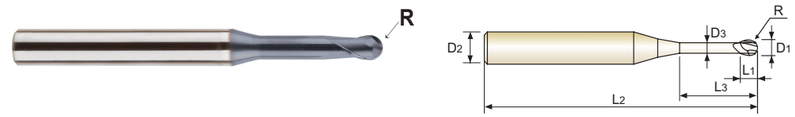
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | Y Coating | p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM8460050016S	R0.25	**0.5**	6	0.5	1	45	0.45
SEM8460050026S	R0.25	**0.5**	6	0.5	2	45	0.45
SEM8460050046S	R0.25	**0.5**	6	0.5	4	45	0.45
SEM8460060016S	R0.3	**0.6**	6	0.6	1	45	0.55
SEM8460060026S	R0.3	**0.6**	6	0.6	2	45	0.55
SEM8460060036S	R0.3	**0.6**	6	0.6	3	45	0.55
SEM8460060046S	R0.3	**0.6**	6	0.6	4	45	0.55
SEM8460060056S	R0.3	**0.6**	6	0.6	5	45	0.55
SEM8460060066S	R0.3	**0.6**	6	0.6	6	45	0.55
SEM8460060086S	R0.3	**0.6**	6	0.6	8	45	0.55
SEM8460061106S	R0.3	**0.6**	6	0.6	10	45	0.55
SEM8460061126S	R0.3	**0.6**	6	0.6	12	45	0.55
SEM8460061146S	R0.3	**0.6**	6	0.6	14	45	0.55
SEM8460061166S	R0.3	**0.6**	6	0.6	16	45	0.55
SEM8460080016S	R0.4	**0.8**	6	0.8	1	45	0.75
SEM8460080026S	R0.4	**0.8**	6	0.8	2	45	0.75
SEM8460080036S	R0.4	**0.8**	6	0.8	3	45	0.75
SEM8460080046S	R0.4	**0.8**	6	0.8	4	45	0.75
SEM8460080056S	R0.4	**0.8**	6	0.8	5	45	0.75
SEM8460080066S	R0.4	**0.8**	6	0.8	6	45	0.75
SEM8460080086S	R0.4	**0.8**	6	0.8	8	45	0.75
SEM8460081106S	R0.4	**0.8**	6	0.8	10	45	0.75
SEM8460081126S	R0.4	**0.8**	6	0.8	12	45	0.75
SEM8460081146S	R0.4	**0.8**	6	0.8	14	45	0.75
SEM8460081166S	R0.4	**0.8**	6	0.8	16	45	0.75
SEM8460082066S	R0.4	**0.8**	6	0.8	20	45	0.75
SEM8460100026S	R0.5	**1.0**	6	1	2	50	0.95
SEM8460100036S	R0.5	**1.0**	6	1	3	50	0.95

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

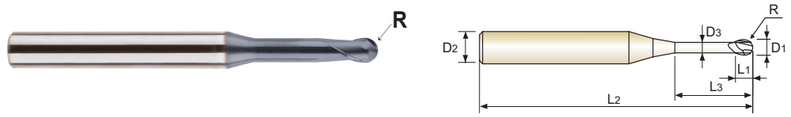
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | Y Coating | p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D_1	D_2	L_1	L_3	L_2	D_3
SEM846010046S	R0.5	**1.0**	6	1	4	50	0.95
SEM846010056S	R0.5	**1.0**	6	1	5	50	0.95
SEM846010066S	R0.5	**1.0**	6	1	6	50	0.95
SEM846010076S	R0.5	**1.0**	6	1	7	50	0.95
SEM846010086S	R0.5	**1.0**	6	1	8	50	0.95
SEM846010096S	R0.5	**1.0**	6	1	9	50	0.95
SEM846010106S	R0.5	**1.0**	6	1	10	50	0.95
SEM846010126S	R0.5	**1.0**	6	1	12	50	0.95
SEM846010146S	R0.5	**1.0**	6	1	14	50	0.95
SEM846010166S	R0.5	**1.0**	6	1	16	50	0.95
SEM846010186S	R0.5	**1.0**	6	1	18	50	0.95
SEM846010206S	R0.5	**1.0**	6	1	20	50	0.95
SEM846010226S	R0.5	**1.0**	6	1	22	60	0.95
SEM846010266S	R0.5	**1.0**	6	1	26	60	0.95
SEM846010306S	R0.5	**1.0**	6	1	30	70	0.95
SEM846015036S	R0.75	**1.5**	6	1.5	3	50	1.45
SEM846015046S	R0.75	**1.5**	6	1.5	4	50	1.45
SEM846015066S	R0.75	**1.5**	6	1.5	6	50	1.45
SEM846015086S	R0.75	**1.5**	6	1.5	8	50	1.45
SEM846015106S	R0.75	**1.5**	6	1.5	10	50	1.45
SEM846015126S	R0.75	**1.5**	6	1.5	12	50	1.45
SEM846015146S	R0.75	**1.5**	6	1.5	14	50	1.45
SEM846015166S	R0.75	**1.5**	6	1.5	16	50	1.45
SEM846015186S	R0.75	**1.5**	6	1.5	18	50	1.45
SEM846015206S	R0.75	**1.5**	6	1.5	20	50	1.45
SEM846015226S	R0.75	**1.5**	6	1.5	22	60	1.45
SEM846015266S	R0.75	**1.5**	6	1.5	26	60	1.45
SEM846015306S	R0.75	**1.5**	6	1.5	30	70	1.45

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

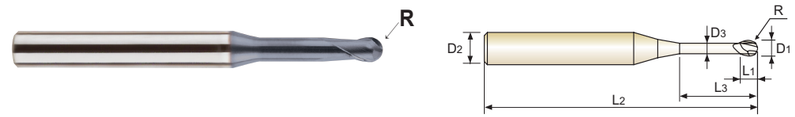
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM846** SERIES

CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.



CARBIDE | 2 | 30° | R ±0.005 | PLAIN | Y Coating | p.C375

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D_1	D_2	L_1	L_3	L_2	D_3
SEM846015356S	R0.75	**1.5**	6	1.5	35	70	1.45
SEM846015406S	R0.75	**1.5**	6	1.5	40	80	1.45
SEM846020046S	R1.0	**2.0**	6	2	4	50	1.95
SEM846020066S	R1.0	**2.0**	6	2	6	50	1.95
SEM846020086S	R1.0	**2.0**	6	2	8	50	1.95
SEM846020106S	R1.0	**2.0**	6	2	10	50	1.95
SEM846020126S	R1.0	**2.0**	6	2	12	50	1.95
SEM846020146S	R1.0	**2.0**	6	2	14	50	1.95
SEM846020166S	R1.0	**2.0**	6	2	16	50	1.95
SEM846020186S	R1.0	**2.0**	6	2	18	50	1.95
SEM846020206S	R1.0	**2.0**	6	2	20	50	1.95
SEM846020226S	R1.0	**2.0**	6	2	22	60	1.95
SEM846020266S	R1.0	**2.0**	6	2	26	60	1.95
SEM846020306S	R1.0	**2.0**	6	2	30	70	1.95
SEM846020356S	R1.0	**2.0**	6	2	35	70	1.95
SEM846020406S	R1.0	**2.0**	6	2	40	80	1.95
SEM846020456S	R1.0	**2.0**	6	2	45	90	1.95
SEM846020506S	R1.0	**2.0**	6	2	50	100	1.95

Mill Dia. Tolerance (mm)	Radius Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	±0.005	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

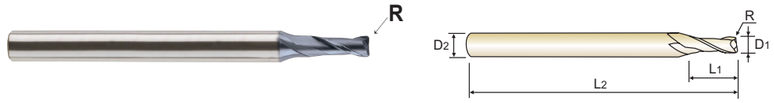
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Available aashort, regular and long shank end mills.
- ▶Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.



CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating | p.C386

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD99002002	R0.02	0.2	4	0.4	40	-
SEMD99002005	R0.05	0.2	4	0.4	40	-
SEMD99003002	R0.02	0.3	4	0.6	40	-
SEMD99003005	R0.05	0.3	4	0.6	40	-
SEMD99004005	R0.05	0.4	4	0.8	40	-
SEMD9900401	R0.1	0.4	4	0.8	40	-
SEMD99005005	R0.05	0.5	4	1.0	40	-
SEMD9900501	R0.1	0.5	4	1.0	40	-
SEMD99006005	R0.05	0.6	4	1.2	40	-
SEMD9900601	R0.1	0.6	4	1.2	40	-
SEMD9900602	R0.2	0.6	4	1.2	40	-
SEMD99007005	R0.05	0.7	4	1.4	40	-
SEMD9900701	R0.1	0.7	4	1.4	40	-
SEMD9900702	R0.2	0.7	4	1.4	40	-
SEMD99008005	R0.05	0.8	4	1.6	40	-
SEMD9900801	R0.1	0.8	4	1.6	40	-
SEMD9900802	R0.2	0.8	4	1.6	40	-
SEMD99009005	R0.05	0.9	4	1.8	40	-
SEMD9900901	R0.1	0.9	4	1.8	40	-
SEMD99010005	R0.05	1.0	6	2.5	50	-
SEMD9901001	R0.1	1.0	6	2.5	50	-
SEMD9901002	R0.2	1.0	6	2.5	50	-
SEMD9901003	R0.3	1.0	6	2.5	50	-
SEMD99012005	R0.05	1.2	6	3	50	-
SEMD9901201	R0.1	1.2	6	3	50	-
SEMD9901202	R0.2	1.2	6	3	50	-
SEMD9901203	R0.3	1.2	6	3	50	-
SEMD99015005	R0.05	1.5	6	4	50	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

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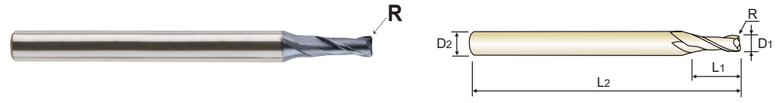

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating | p.C386

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD9901501	R0.1	1.5	6	4	50	-
SEMD9901502	R0.2	1.5	6	4	50	-
SEMD9901503	R0.3	1.5	6	4	50	-
SEMD9901505	R0.5	1.5	6	4	50	-
SEMD9902001	R0.1	2.0	6	6	50	-
SEMD9902002	R0.2	2.0	6	6	50	-
SEMD9902003	R0.3	2.0	6	6	50	-
SEMD9902005	R0.5	2.0	6	6	50	-
SEMD9902501	R0.1	2.5	6	7	60	-
SEMD9902502	R0.2	2.5	6	7	60	-
SEMD9902503	R0.3	2.5	6	7	60	-
SEMD9902505	R0.5	2.5	6	7	60	-
SEMD9903001	R0.1	3.0	6	8	60	-
SEMD9903002	R0.2	3.0	6	8	60	-
SEMD9903003	R0.3	3.0	6	8	60	-
SEMD9903005	R0.5	3.0	6	8	60	-
SEMD9903010	R1.0	3.0	6	8	60	-
SEMD9903501	R0.1	3.5	6	10	70	-
SEMD9903502	R0.2	3.5	6	10	70	-
SEMD9903503	R0.3	3.5	6	10	70	-
SEMD9903505	R0.5	3.5	6	10	70	-
SEMD990400014S	R0.1	4.0	4	10	70	4mm Shank
SEMD990400024S	R0.2	4.0	4	10	70	4mm Shank
SEMD990400034S	R0.3	4.0	4	10	70	4mm Shank
SEMD990400054S	R0.5	4.0	4	10	70	4mm Shank
SEMD990400104S	R1.0	4.0	4	10	70	4mm Shank
SEMD990400011004S	R0.1	4.0	4	10	100	4mm Shank
SEMD990400021004S	R0.2	4.0	4	10	100	4mm Shank

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

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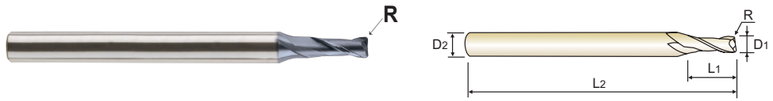

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C386

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD990400031004S	R0.3	**4.0**	4	10	100	4mm Shank
SEMD990400051004S	R0.5	**4.0**	4	10	100	4mm Shank
SEMD990401010O4S	R1.0	**4.0**	4	10	100	4mm Shank
SEMD9904001	R0.1	**4.0**	6	10	70	Regular
SEMD9904002	R0.2	**4.0**	6	10	70	Regular
SEMD9904003	R0.3	**4.0**	6	10	70	Regular
SEMD9904005	R0.5	**4.0**	6	10	70	Regular
SEMD9904010	R1.0	**4.0**	6	10	70	Regular
SEMD9904501	R0.1	**4.5**	6	11	80	-
SEMD9904502	R0.2	**4.5**	6	11	80	-
SEMD9904503	R0.3	**4.5**	6	11	80	-
SEMD9904505	R0.5	**4.5**	6	11	80	-
SEMD9905001	R0.1	**5.0**	6	13	90	-
SEMD9905002	R0.2	**5.0**	6	13	90	-
SEMD9905003	R0.3	**5.0**	6	13	90	-
SEMD9905005	R0.5	**5.0**	6	13	90	-
SEMD9905010	R1.0	**5.0**	6	13	90	-
SEMD9905501	R0.1	**5.5**	6	13	90	-
SEMD9905502	R0.2	**5.5**	6	13	90	-
SEMD9905503	R0.3	**5.5**	6	13	90	-
SEMD9905505	R0.5	**5.5**	6	13	90	-
SEMD9905510	R1.0	**5.5**	6	13	90	-
SEMD9906002060	R0.2	**6.0**	6	15	60	Short
SEMD9906003060	R0.3	**6.0**	6	15	60	Short
SEMD9906005060	R0.5	**6.0**	6	15	60	Short
SEMD9906010060	R1.0	**6.0**	6	15	60	Short
SEMD9906001	R0.1	**6.0**	6	15	90	Regular
SEMD9906002	R0.2	**6.0**	6	15	90	Regular

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK SEMD99 SERIES

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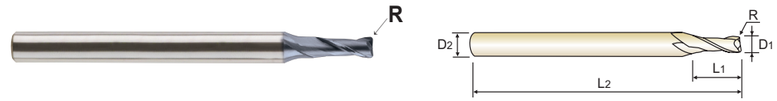

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C386

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD9906003	R0.3	**6.0**	6	15	90	Regular
SEMD9906005	R0.5	**6.0**	6	15	90	Regular
SEMD9906010	R1.0	**6.0**	6	15	90	Regular
SEMD9906015	R1.5	**6.0**	6	15	90	Regular
SEMD9906020	R2.0	**6.0**	6	15	90	Regular
SEMD9906005110	R0.5	**6.0**	6	15	110	Long Shank
SEMD9906010110	R1.0	**6.0**	6	15	110	Long Shank
SEMD9906005130	R0.5	**6.0**	6	15	130	Long Shank
SEMD9906010130	R1.0	**6.0**	6	15	130	Long Shank
SEMD9907001	R0.1	**7.0**	8	16	90	-
SEMD9907002	R0.2	**7.0**	8	16	90	-
SEMD9907003	R0.3	**7.0**	8	16	90	-
SEMD9907005	R0.5	**7.0**	8	16	90	-
SEMD9907010	R1.0	**7.0**	8	16	90	-
SEMD9907020	R2.0	**7.0**	8	16	90	-
SEMD9908003070	R0.3	**8.0**	8	20	70	Short
SEMD9908005070	R0.5	**8.0**	8	20	70	Short
SEMD9908010070	R1.0	**8.0**	8	20	70	Short
SEMD9908001	R0.1	**8.0**	8	20	100	Regular
SEMD9908002	R0.2	**8.0**	8	20	100	Regular
SEMD9908003	R0.3	**8.0**	8	20	100	Regular
SEMD9908005	R0.5	**8.0**	8	20	100	Regular
SEMD9908010	R1.0	**8.0**	8	20	100	Regular
SEMD9908015	R1.5	**8.0**	8	20	100	Regular
SEMD9908020	R2.0	**8.0**	8	20	100	Regular
SEMD9908025	R2.5	**8.0**	8	20	100	Regular
SEMD9908030	R3.0	**8.0**	8	20	100	Regular
SEMD9908005120	R0.5	**8.0**	8	20	120	Long Shank

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

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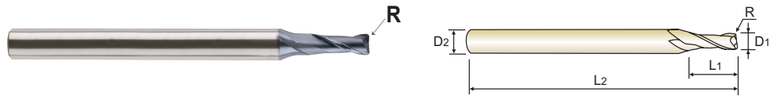


CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C386

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD9908010120	R1.0	**8.0**	8	20	120	Long Shank
SEMD9908015150	R0.5	**8.0**	8	20	150	Long Shank
SEMD9908010150	R1.0	**8.0**	8	20	150	Long Shank
SEMD9910003075	R0.3	**10.0**	10	25	75	Short
SEMD9910005075	R0.5	**10.0**	10	25	75	Short
SEMD9910010075	R1.0	**10.0**	10	25	75	Short
SEMD9910001	R0.1	**10.0**	10	25	100	Regular
SEMD9910002	R0.2	**10.0**	10	25	100	Regular
SEMD9910003	R0.3	**10.0**	10	25	100	Regular
SEMD9910005	R0.5	**10.0**	10	25	100	Regular
SEMD9910010	R1.0	**10.0**	10	25	100	Regular
SEMD9910015	R1.5	**10.0**	10	25	100	Regular
SEMD9910020	R2.0	**10.0**	10	25	100	Regular
SEMD9910025	R2.5	**10.0**	10	25	100	Regular
SEMD9910030	R3.0	**10.0**	10	25	100	Regular
SEMD9910040	R4.0	**10.0**	10	25	100	Regular
SEMD9910005130	R0.5	**10.0**	10	25	130	Long Shank
SEMD9910010130	R1.0	**10.0**	10	25	130	Long Shank
SEMD9910005150	R0.5	**10.0**	10	25	150	Long Shank
SEMD9910010150	R1.0	**10.0**	10	25	150	Long Shank
SEMD9911002	R0.2	**11.0**	12	25	110	-
SEMD9911003	R0.3	**11.0**	12	25	110	-
SEMD9911005	R0.5	**11.0**	12	25	110	-
SEMD9911010	R1.0	**11.0**	12	25	110	-
SEMD9911020	R2.0	**11.0**	12	25	110	-
SEMD9912003080	R0.3	**12.0**	12	30	80	Short
SEMD9912005080	R0.5	**12.0**	12	30	80	Short
SEMD9912010080	R1.0	**12.0**	12	30	80	Short

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

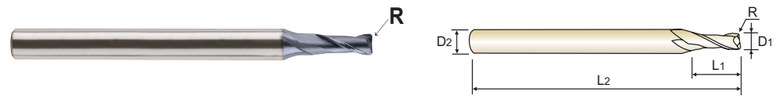
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEMD99** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Available short, regular and long shank end mills.
- ▶Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.



CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C386

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEMD9912001	R0.1	**12.0**	12	30	110	Regular
SEMD9912002	R0.2	**12.0**	12	30	110	Regular
SEMD9912003	R0.3	**12.0**	12	30	110	Regular
SEMD9912005	R0.5	**12.0**	12	30	110	Regular
SEMD9912010	R1.0	**12.0**	12	30	110	Regular
SEMD9912015	R1.5	**12.0**	12	30	110	Regular
SEMD9912020	R2.0	**12.0**	12	30	110	Regular
SEMD9912025	R2.5	**12.0**	12	30	110	Regular
SEMD9912030	R3.0	**12.0**	12	30	110	Regular
SEMD9912040	R4.0	**12.0**	12	30	110	Regular
SEMD9912050	R5.0	**12.0**	12	30	110	Regular
SEMD9912005130	R0.5	**12.0**	12	30	130	Long Shank
SEMD9912010130	R1.0	**12.0**	12	30	130	Long Shank
SEMD9912005150	R0.5	**12.0**	12	30	150	Long Shank
SEMD9912010150	R1.0	**12.0**	12	30	150	Long Shank
SEMD9914005	R0.5	**14.0**	16	35	150	-
SEMD9914010	R1.0	**14.0**	16	35	150	-
SEMD9914020	R2.0	**14.0**	16	35	150	-
SEMD9916005	R0.5	**16.0**	16	32	150	-
SEMD9916010	R1.0	**16.0**	16	32	150	-
SEMD9916015	R1.5	**16.0**	16	32	150	-
SEMD9916020	R2.0	**16.0**	16	32	150	-
SEMD9920005	R0.5	**20.0**	20	38	150	-
SEMD9920010	R1.0	**20.0**	20	38	150	-
SEMD9920015	R1.5	**20.0**	20	38	150	-
SEMD9920020	R2.0	**20.0**	20	38	150	-

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0~-0.012	h5
over Ø6	±0.015	0~-0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

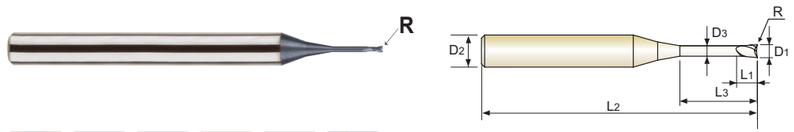
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.



CARBIDE | 2 | 30° | R ±0.010 R≤6 | R ±0.015 D>6 | PLAIN | Y Coating | p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME61002002005	R0.02	**0.2**	4	0.3	0.5	40	0.17	-
SEME6100200201	R0.02	**0.2**	4	0.3	1	40	0.17	-
SEME61002002015	R0.02	**0.2**	4	0.3	1.5	40	0.17	-
SEME6100200202	R0.02	**0.2**	4	0.3	2	40	0.17	-
SEME61002005005	R0.05	**0.2**	4	0.3	0.5	40	0.17	-
SEME6100200501	R0.05	**0.2**	4	0.3	1	40	0.17	-
SEME61002005015	R0.05	**0.2**	4	0.3	1.5	40	0.17	-
SEME6100200502	R0.05	**0.2**	4	0.3	2	40	0.17	-
SEME6100300201	R0.02	**0.3**	4	0.5	1	40	0.27	-
SEME6100300202	R0.02	**0.3**	4	0.5	2	40	0.27	-
SEME6100300203	R0.02	**0.3**	4	0.5	3	40	0.27	-
SEME6100300501	R0.05	**0.3**	4	0.5	1	40	0.27	-
SEME6100300502	R0.05	**0.3**	4	0.5	2	40	0.27	-
SEME6100300503	R0.05	**0.3**	4	0.5	3	40	0.27	-
SEME6100400501	R0.05	**0.4**	4	0.6	1	40	0.37	-
SEME61004005015	R0.05	**0.4**	4	0.6	1.5	40	0.37	-
SEME6100400502	R0.05	**0.4**	4	0.6	2	40	0.37	-
SEME61004005025	R0.05	**0.4**	4	0.6	2.5	40	0.37	-
SEME6100400503	R0.05	**0.4**	4	0.6	3	40	0.37	-
SEME6100400504	R0.05	**0.4**	4	0.6	4	40	0.37	-
SEME610040101	R0.1	**0.4**	4	0.6	1	40	0.37	-
SEME6100401015	R0.1	**0.4**	4	0.6	1.5	40	0.37	-
SEME610040102	R0.1	**0.4**	4	0.6	2	40	0.37	-
SEME6100401025	R0.1	**0.4**	4	0.6	2.5	40	0.37	-
SEME610040103	R0.1	**0.4**	4	0.6	3	40	0.37	-
SEME610040104	R0.1	**0.4**	4	0.6	4	40	0.37	-
SEME6100500501	R0.05	**0.5**	4	0.7	1	45	0.45	-
SEME61005005015	R0.05	**0.5**	4	0.7	1.5	45	0.45	-

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

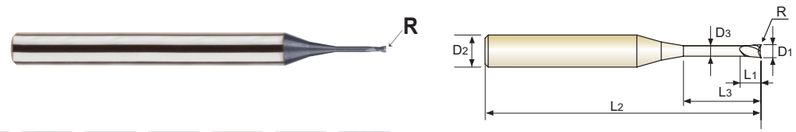
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.



CARBIDE | 2 | 30° | R ±0.010 R≤6 | R ±0.015 D>6 | PLAIN | Y Coating | p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6100500502	R0.05	**0.5**	4	0.7	2	45	0.45	-
SEME61005005025	R0.05	**0.5**	4	0.7	2.5	45	0.45	-
SEME6100500503	R0.05	**0.5**	4	0.7	3	45	0.45	-
SEME6100500504	R0.05	**0.5**	4	0.7	4	45	0.45	-
SEME6100500505	R0.05	**0.5**	4	0.7	5	45	0.45	-
SEME6100500506	R0.05	**0.5**	4	0.7	6	45	0.45	-
SEME610050101	R0.1	**0.5**	4	0.7	1	45	0.45	-
SEME6100501015	R0.1	**0.5**	4	0.7	1.5	45	0.45	-
SEME610050102	R0.1	**0.5**	4	0.7	2	45	0.45	-
SEME6100501025	R0.1	**0.5**	4	0.7	2.5	45	0.45	-
SEME610050103	R0.1	**0.5**	4	0.7	3	45	0.45	-
SEME610050104	R0.1	**0.5**	4	0.7	4	45	0.45	-
SEME610050105	R0.1	**0.5**	4	0.7	5	45	0.45	-
SEME610050106	R0.1	**0.5**	4	0.7	6	45	0.45	-
SEME6100600502	R0.05	**0.6**	4	0.9	2	45	0.55	-
SEME6100600503	R0.05	**0.6**	4	0.9	3	45	0.55	-
SEME6100600504	R0.05	**0.6**	4	0.9	4	45	0.55	-
SEME6100600506	R0.05	**0.6**	4	0.9	6	45	0.55	-
SEME6100600508	R0.05	**0.6**	4	0.9	8	45	0.55	-
SEME6100600510	R0.05	**0.6**	4	0.9	10	45	0.55	-
SEME610060102	R0.1	**0.6**	4	0.9	2	45	0.55	-
SEME610060103	R0.1	**0.6**	4	0.9	3	45	0.55	-
SEME610060104	R0.1	**0.6**	4	0.9	4	45	0.55	-
SEME610060106	R0.1	**0.6**	4	0.9	6	45	0.55	-
SEME610060108	R0.1	**0.6**	4	0.9	8	45	0.55	-
SEME610060110	R0.1	**0.6**	4	0.9	10	45	0.55	-
SEME610060202	R0.2	**0.6**	4	0.9	2	45	0.55	-
SEME610060203	R0.2	**0.6**	4	0.9	3	45	0.55	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

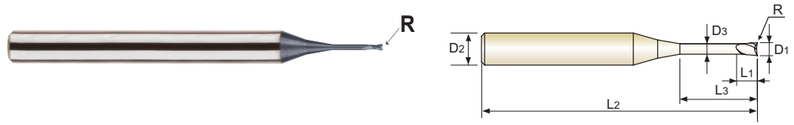
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Available various products like regular length and long shank end mills etc.
- ▶Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- ▶Available more various effective length and overall length end mills than previous standard products.



CARBIDE | 2 | 30° | R ±0.010 R≤6 | R ±0.015 D>6 | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610060204	R0.2	0.6	4	0.9	4	45	0.55	-
SEME610060206	R0.2	0.6	4	0.9	6	45	0.55	-
SEME610060208	R0.2	0.6	4	0.9	8	45	0.55	-
SEME610060210	R0.2	0.6	4	0.9	10	45	0.55	-
SEME6100700502	R0.05	0.7	4	1.2	2	45	0.65	-
SEME6100700504	R0.05	0.7	4	1.2	4	45	0.65	-
SEME6100700506	R0.05	0.7	4	1.2	6	45	0.65	-
SEME6100700508	R0.05	0.7	4	1.2	8	45	0.65	-
SEME6100700510	R0.05	0.7	4	1.2	10	45	0.65	-
SEME610070102	R0.1	0.7	4	1.2	2	45	0.65	-
SEME610070104	R0.1	0.7	4	1.2	4	45	0.65	-
SEME610070106	R0.1	0.7	4	1.2	6	45	0.65	-
SEME610070108	R0.1	0.7	4	1.2	8	45	0.65	-
SEME610070110	R0.1	0.7	4	1.2	10	45	0.65	-
SEME610070202	R0.2	0.7	4	1.2	2	45	0.65	-
SEME610070204	R0.2	0.7	4	1.2	4	45	0.65	-
SEME610070206	R0.2	0.7	4	1.2	6	45	0.65	-
SEME610070208	R0.2	0.7	4	1.2	8	45	0.65	-
SEME610070210	R0.2	0.7	4	1.2	10	45	0.65	-
SEME6100800502	R0.05	0.8	4	1.2	2	45	0.75	-
SEME6100800503	R0.05	0.8	4	1.2	3	45	0.75	-
SEME6100800504	R0.05	0.8	4	1.2	4	45	0.75	-
SEME6100800506	R0.05	0.8	4	1.2	6	45	0.75	-
SEME6100800508	R0.05	0.8	4	1.2	8	45	0.75	-
SEME6100800510	R0.05	0.8	4	1.2	10	45	0.75	-
SEME610080102	R0.1	0.8	4	1.2	2	45	0.75	-
SEME610080103	R0.1	0.8	4	1.2	3	45	0.75	-
SEME610080104	R0.1	0.8	4	1.2	4	45	0.75	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

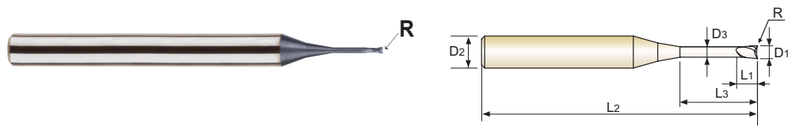
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Available various products like regular length and long shank end mills etc.
- ▶Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- ▶Available more various effective length and overall length end mills than previous standard products.



CARBIDE | 2 | 30° | R ±0.010 R≤6 | R ±0.015 D>6 | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610080106	R0.1	0.8	4	1.2	6	45	0.75	-
SEME610080108	R0.1	0.8	4	1.2	8	45	0.75	-
SEME610080110	R0.1	0.8	4	1.2	10	45	0.75	-
SEME610080202	R0.2	0.8	4	1.2	2	45	0.75	-
SEME610080203	R0.2	0.8	4	1.2	3	45	0.75	-
SEME610080204	R0.2	0.8	4	1.2	4	45	0.75	-
SEME610080206	R0.2	0.8	4	1.2	6	45	0.75	-
SEME610080208	R0.2	0.8	4	1.2	8	45	0.75	-
SEME610080210	R0.2	0.8	4	1.2	10	45	0.75	-
SEME6101000503	R0.05	1.0	4	1.5	3	50	0.95	-
SEME6101000504	R0.05	1.0	4	1.5	4	50	0.95	-
SEME6101000506	R0.05	1.0	4	1.5	6	50	0.95	-
SEME6101000508	R0.05	1.0	4	1.5	8	50	0.95	-
SEME6101000510	R0.05	1.0	4	1.5	10	50	0.95	-
SEME6101000512	R0.05	1.0	4	1.5	12	50	0.95	-
SEME6101000514	R0.05	1.0	4	1.5	14	50	0.95	-
SEME6101000516	R0.05	1.0	4	1.5	16	50	0.95	-
SEME6101000520	R0.05	1.0	4	1.5	20	50	0.95	-
SEME610100103	R0.1	1.0	4	1.5	3	50	0.95	-
SEME610100104	R0.1	1.0	4	1.5	4	50	0.95	-
SEME610100106	R0.1	1.0	4	1.5	6	50	0.95	-
SEME610100108	R0.1	1.0	4	1.5	8	50	0.95	-
SEME610100110	R0.1	1.0	4	1.5	10	50	0.95	-
SEME610100112	R0.1	1.0	4	1.5	12	50	0.95	-
SEME610100114	R0.1	1.0	4	1.5	14	50	0.95	-
SEME610100116	R0.1	1.0	4	1.5	16	50	0.95	-
SEME610100120	R0.1	1.0	4	1.5	20	50	0.95	-
SEME610100203	R0.2	1.0	4	1.5	3	50	0.95	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
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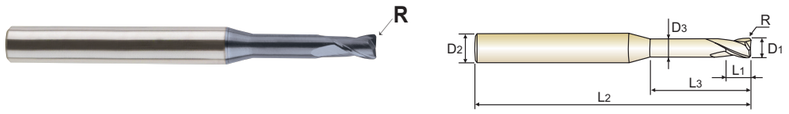

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610100204	R0.2	1.0	4	1.5	4	50	0.95	-
SEME610100206	R0.2	1.0	4	1.5	6	50	0.95	-
SEME610100208	R0.2	1.0	4	1.5	8	50	0.95	-
SEME610100210	R0.2	1.0	4	1.5	10	50	0.95	-
SEME610100212	R0.2	1.0	4	1.5	12	50	0.95	-
SEME610100214	R0.2	1.0	4	1.5	14	50	0.95	-
SEME610100216	R0.2	1.0	4	1.5	16	50	0.95	-
SEME610100220	R0.2	1.0	4	1.5	20	50	0.95	-
SEME610100303	R0.3	1.0	4	1.5	3	50	0.95	-
SEME610100304	R0.3	1.0	4	1.5	4	50	0.95	-
SEME610100306	R0.3	1.0	4	1.5	6	50	0.95	-
SEME610100308	R0.3	1.0	4	1.5	8	50	0.95	-
SEME610100310	R0.3	1.0	4	1.5	10	50	0.95	-
SEME610100312	R0.3	1.0	4	1.5	12	50	0.95	-
SEME610100314	R0.3	1.0	4	1.5	14	50	0.95	-
SEME610100316	R0.3	1.0	4	1.5	16	50	0.95	-
SEME610100320	R0.3	1.0	4	1.5	20	50	0.95	-
SEME6101200503	R0.05	1.2	4	1.8	3	50	1.15	-
SEME6101200504	R0.05	1.2	4	1.8	4	50	1.15	-
SEME6101200506	R0.05	1.2	4	1.8	6	50	1.15	-
SEME6101200508	R0.05	1.2	4	1.8	8	50	1.15	-
SEME6101200510	R0.05	1.2	4	1.8	10	50	1.15	-
SEME6101200512	R0.05	1.2	4	1.8	12	50	1.15	-
SEME6101200516	R0.05	1.2	4	1.8	16	50	1.15	-
SEME6101200520	R0.05	1.2	4	1.8	20	50	1.15	-
SEME610120103	R0.1	1.2	4	1.8	3	50	1.15	-
SEME610120104	R0.1	1.2	4	1.8	4	50	1.15	-
SEME610120106	R0.1	1.2	4	1.8	6	50	1.15	-

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

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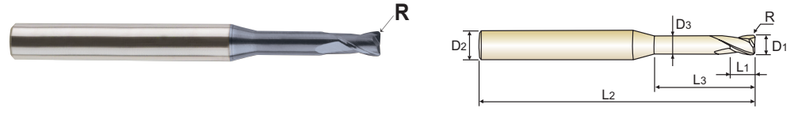

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610120108	R0.1	1.2	4	1.8	8	50	1.15	-
SEME610120110	R0.1	1.2	4	1.8	10	50	1.15	-
SEME610120112	R0.1	1.2	4	1.8	12	50	1.15	-
SEME610120116	R0.1	1.2	4	1.8	16	50	1.15	-
SEME610120120	R0.1	1.2	4	1.8	20	50	1.15	-
SEME610120203	R0.2	1.2	4	1.8	3	50	1.15	-
SEME610120204	R0.2	1.2	4	1.8	4	50	1.15	-
SEME610120206	R0.2	1.2	4	1.8	6	50	1.15	-
SEME610120208	R0.2	1.2	4	1.8	8	50	1.15	-
SEME610120210	R0.2	1.2	4	1.8	10	50	1.15	-
SEME610120212	R0.2	1.2	4	1.8	12	50	1.15	-
SEME610120216	R0.2	1.2	4	1.8	16	50	1.15	-
SEME610120220	R0.2	1.2	4	1.8	20	50	1.15	-
SEME610120303	R0.3	1.2	4	1.8	3	50	1.15	-
SEME610120304	R0.3	1.2	4	1.8	4	50	1.15	-
SEME610120306	R0.3	1.2	4	1.8	6	50	1.15	-
SEME610120308	R0.3	1.2	4	1.8	8	50	1.15	-
SEME610120310	R0.3	1.2	4	1.8	10	50	1.15	-
SEME610120312	R0.3	1.2	4	1.8	12	50	1.15	-
SEME610120316	R0.3	1.2	4	1.8	16	50	1.15	-
SEME610120320	R0.3	1.2	4	1.8	20	50	1.15	-
SEME6101500504	R0.05	1.5	4	2.3	4	50	1.45	-
SEME6101500506	R0.05	1.5	4	2.3	6	50	1.45	-
SEME6101500508	R0.05	1.5	4	2.3	8	50	1.45	-
SEME6101500510	R0.05	1.5	4	2.3	10	50	1.45	-
SEME6101500512	R0.05	1.5	4	2.3	12	50	1.45	-
SEME6101500514	R0.05	1.5	4	2.3	14	50	1.45	-
SEME6101500516	R0.05	1.5	4	2.3	16	50	1.45	-

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

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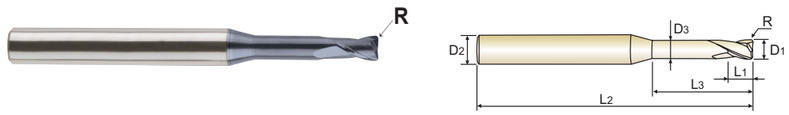


CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6101500520	R0.05	1.5	4	2.3	20	50	1.45	-
SEME6101500522	R0.05	1.5	4	2.3	22	60	1.45	-
SEME6101500526	R0.05	1.5	4	2.3	26	60	1.45	-
SEME610150104	R0.1	1.5	4	2.3	4	50	1.45	-
SEME610150106	R0.1	1.5	4	2.3	6	50	1.45	-
SEME610150108	R0.1	1.5	4	2.3	8	50	1.45	-
SEME610150110	R0.1	1.5	4	2.3	10	50	1.45	-
SEME610150112	R0.1	1.5	4	2.3	12	50	1.45	-
SEME610150114	R0.1	1.5	4	2.3	14	50	1.45	-
SEME610150116	R0.1	1.5	4	2.3	16	50	1.45	-
SEME610150120	R0.1	1.5	4	2.3	20	50	1.45	-
SEME610150122	R0.1	1.5	4	2.3	22	60	1.45	-
SEME610150126	R0.1	1.5	4	2.3	26	60	1.45	-
SEME610150204	R0.2	1.5	4	2.3	4	50	1.45	-
SEME610150206	R0.2	1.5	4	2.3	6	50	1.45	-
SEME610150208	R0.2	1.5	4	2.3	8	50	1.45	-
SEME610150210	R0.2	1.5	4	2.3	10	50	1.45	-
SEME610150212	R0.2	1.5	4	2.3	12	50	1.45	-
SEME610150214	R0.2	1.5	4	2.3	14	50	1.45	-
SEME610150216	R0.2	1.5	4	2.3	16	50	1.45	-
SEME610150220	R0.2	1.5	4	2.3	20	50	1.45	-
SEME610150222	R0.2	1.5	4	2.3	22	60	1.45	-
SEME610150226	R0.2	1.5	4	2.3	26	60	1.45	-
SEME610150304	R0.3	1.5	4	2.3	4	50	1.45	-
SEME610150306	R0.3	1.5	4	2.3	6	50	1.45	-
SEME610150308	R0.3	1.5	4	2.3	8	50	1.45	-
SEME610150310	R0.3	1.5	4	2.3	10	50	1.45	-
SEME610150312	R0.3	1.5	4	2.3	12	50	1.45	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

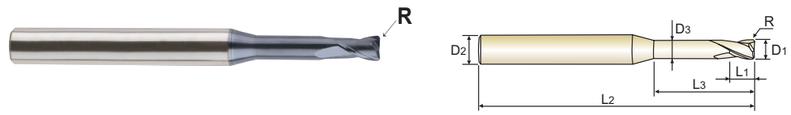
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.



CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610150314	R0.3	1.5	4	2.3	14	50	1.45	-
SEME610150316	R0.3	1.5	4	2.3	16	50	1.45	-
SEME610150320	R0.3	1.5	4	2.3	20	50	1.45	-
SEME610150322	R0.3	1.5	4	2.3	22	60	1.45	-
SEME610150326	R0.3	1.5	4	2.3	26	60	1.45	-
SEME610150504	R0.5	1.5	4	2.3	4	50	1.45	-
SEME610150506	R0.5	1.5	4	2.3	6	50	1.45	-
SEME610150508	R0.5	1.5	4	2.3	8	50	1.45	-
SEME610150510	R0.5	1.5	4	2.3	10	50	1.45	-
SEME610150512	R0.5	1.5	4	2.3	12	50	1.45	-
SEME610150514	R0.5	1.5	4	2.3	14	50	1.45	-
SEME610150516	R0.5	1.5	4	2.3	16	50	1.45	-
SEME610150520	R0.5	1.5	4	2.3	20	50	1.45	-
SEME610150522	R0.5	1.5	4	2.3	22	60	1.45	-
SEME610150526	R0.5	1.5	4	2.3	26	60	1.45	-
SEME610200106	R0.1	2.0	4	3	6	50	1.95	-
SEME610200108	R0.1	2.0	4	3	8	50	1.95	-
SEME610200110	R0.1	2.0	4	3	10	50	1.95	-
SEME610200112	R0.1	2.0	4	3	12	50	1.95	-
SEME610200114	R0.1	2.0	4	3	14	50	1.95	-
SEME610200116	R0.1	2.0	4	3	16	50	1.95	-
SEME610200120	R0.1	2.0	4	3	20	50	1.95	-
SEME610200122	R0.1	2.0	4	3	22	60	1.95	-
SEME610200126	R0.1	2.0	4	3	26	60	1.95	-
SEME610200130	R0.1	2.0	4	3	30	70	1.95	-
SEME610200206	R0.2	2.0	4	3	6	50	1.95	-
SEME610200208	R0.2	2.0	4	3	8	50	1.95	-
SEME610200210	R0.2	2.0	4	3	10	50	1.95	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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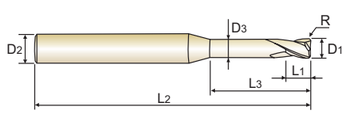

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610200212	R0.2	2.0	4	3	12	50	1.95	-
SEME610200214	R0.2	2.0	4	3	14	50	1.95	-
SEME610200216	R0.2	2.0	4	3	16	50	1.95	-
SEME610200220	R0.2	2.0	4	3	20	50	1.95	-
SEME610200222	R0.2	2.0	4	3	22	60	1.95	-
SEME610200226	R0.2	2.0	4	3	26	60	1.95	-
SEME610200230	R0.2	2.0	4	3	30	70	1.95	-
SEME610200306	R0.3	2.0	4	3	6	50	1.95	-
SEME610200308	R0.3	2.0	4	3	8	50	1.95	-
SEME610200310	R0.3	2.0	4	3	10	50	1.95	-
SEME610200312	R0.3	2.0	4	3	12	50	1.95	-
SEME610200314	R0.3	2.0	4	3	14	50	1.95	-
SEME610200316	R0.3	2.0	4	3	16	50	1.95	-
SEME610200320	R0.3	2.0	4	3	20	50	1.95	-
SEME610200322	R0.3	2.0	4	3	22	60	1.95	-
SEME610200326	R0.3	2.0	4	3	26	60	1.95	-
SEME610200330	R0.3	2.0	4	3	30	70	1.95	-
SEME610200506	R0.5	2.0	4	3	6	50	1.95	-
SEME610200508	R0.5	2.0	4	3	8	50	1.95	-
SEME610200510	R0.5	2.0	4	3	10	50	1.95	-
SEME610200512	R0.5	2.0	4	3	12	50	1.95	-
SEME610200514	R0.5	2.0	4	3	14	50	1.95	-
SEME610200516	R0.5	2.0	4	3	16	50	1.95	-
SEME610200520	R0.5	2.0	4	3	20	50	1.95	-
SEME610200522	R0.5	2.0	4	3	22	60	1.95	-
SEME610200526	R0.5	2.0	4	3	26	60	1.95	-
SEME610200530	R0.5	2.0	4	3	30	70	1.95	-
SEME610250108	R0.1	2.5	4	4	8	50	2.40	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

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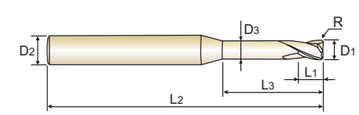

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610250110	R0.1	2.5	4	4	10	50	2.40	-
SEME610250112	R0.1	2.5	4	4	12	50	2.40	-
SEME610250114	R0.1	2.5	4	4	14	50	2.40	-
SEME610250116	R0.1	2.5	4	4	16	50	2.40	-
SEME610250120	R0.1	2.5	4	4	20	50	2.40	-
SEME610250126	R0.1	2.5	4	4	26	60	2.40	-
SEME610250130	R0.1	2.5	4	4	30	70	2.40	-
SEME610250208	R0.2	2.5	4	4	8	50	2.40	-
SEME610250210	R0.2	2.5	4	4	10	50	2.40	-
SEME610250212	R0.2	2.5	4	4	12	50	2.40	-
SEME610250214	R0.2	2.5	4	4	14	50	2.40	-
SEME610250216	R0.2	2.5	4	4	16	50	2.40	-
SEME610250220	R0.2	2.5	4	4	20	50	2.40	-
SEME610250226	R0.2	2.5	4	4	26	60	2.40	-
SEME610250230	R0.2	2.5	4	4	30	70	2.40	-
SEME610250308	R0.3	2.5	4	4	8	50	2.40	-
SEME610250310	R0.3	2.5	4	4	10	50	2.40	-
SEME610250312	R0.3	2.5	4	4	12	50	2.40	-
SEME610250314	R0.3	2.5	4	4	14	50	2.40	-
SEME610250316	R0.3	2.5	4	4	16	50	2.40	-
SEME610250320	R0.3	2.5	4	4	20	50	2.40	-
SEME610250326	R0.3	2.5	4	4	26	60	2.40	-
SEME610250330	R0.3	2.5	4	4	30	70	2.40	-
SEME610250508	R0.5	2.5	6	4	8	50	2.40	-
SEME610250510	R0.5	2.5	6	4	10	50	2.40	-
SEME610250512	R0.5	2.5	6	4	12	50	2.40	-
SEME610250514	R0.5	2.5	6	4	14	50	2.40	-
SEME610250516	R0.5	2.5	6	4	16	50	2.40	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

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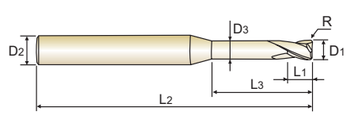

CARBIDE | 2 | 30° | R ±0.010 R≤6 | R ±0.015 D>6 | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610250520	R0.5	2.5	6	4	20	50	2.40	-
SEME610250526	R0.5	2.5	6	4	26	60	2.40	-
SEME610250530	R0.5	2.5	6	4	30	70	2.40	-
SEME610300108	R0.1	3.0	6	4.5	8	50	2.85	-
SEME610300110	R0.1	3.0	6	4.5	10	50	2.85	-
SEME610300112	R0.1	3.0	6	4.5	12	50	2.85	-
SEME610300114	R0.1	3.0	6	4.5	14	60	2.85	-
SEME610300116	R0.1	3.0	6	4.5	16	60	2.85	-
SEME610300120	R0.1	3.0	6	4.5	20	60	2.85	-
SEME610300126	R0.1	3.0	6	4.5	26	65	2.85	-
SEME610300130	R0.1	3.0	6	4.5	30	70	2.85	-
SEME610300135	R0.1	3.0	6	4.5	35	70	2.85	-
SEME610300140	R0.1	3.0	6	4.5	40	80	2.85	-
SEME610300208	R0.2	3.0	6	4.5	8	50	2.85	-
SEME610300210	R0.2	3.0	6	4.5	10	50	2.85	-
SEME610300212	R0.2	3.0	6	4.5	12	50	2.85	-
SEME610300214	R0.2	3.0	6	4.5	14	60	2.85	-
SEME610300216	R0.2	3.0	6	4.5	16	60	2.85	-
SEME610300220	R0.2	3.0	6	4.5	20	60	2.85	-
SEME610300226	R0.2	3.0	6	4.5	26	65	2.85	-
SEME610300230	R0.2	3.0	6	4.5	30	70	2.85	-
SEME610300235	R0.2	3.0	6	4.5	35	70	2.85	-
SEME610300240	R0.2	3.0	6	4.5	40	80	2.85	-
SEME610300308	R0.3	3.0	6	4.5	8	50	2.85	-
SEME610300310	R0.3	3.0	6	4.5	10	50	2.85	-
SEME610300312	R0.3	3.0	6	4.5	12	50	2.85	-
SEME610300314	R0.3	3.0	6	4.5	14	60	2.85	-
SEME610300316	R0.3	3.0	6	4.5	16	60	2.85	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

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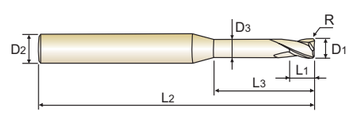


CARBIDE | 2 | 30° | R ±0.010 R≤6 | R ±0.015 D>6 | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610300320	R0.3	3.0	6	4.5	20	60	2.85	-
SEME610300326	R0.3	3.0	6	4.5	26	65	2.85	-
SEME610300330	R0.3	3.0	6	4.5	30	70	2.85	-
SEME610300335	R0.3	3.0	6	4.5	35	70	2.85	-
SEME610300340	R0.3	3.0	6	4.5	40	80	2.85	-
SEME610300508	R0.5	3.0	6	4.5	8	50	2.85	-
SEME610300510	R0.5	3.0	6	4.5	10	50	2.85	-
SEME610300512	R0.5	3.0	6	4.5	12	50	2.85	-
SEME610300514	R0.5	3.0	6	4.5	14	60	2.85	-
SEME610300516	R0.5	3.0	6	4.5	16	60	2.85	-
SEME610300520	R0.5	3.0	6	4.5	20	60	2.85	-
SEME610300526	R0.5	3.0	6	4.5	26	65	2.85	-
SEME610300530	R0.5	3.0	6	4.5	30	70	2.85	-
SEME610300535	R0.5	3.0	6	4.5	35	70	2.85	-
SEME610300540	R0.5	3.0	6	4.5	40	80	2.85	-
SEME610301008	R1.0	3.0	6	4.5	8	50	2.85	-
SEME610301010	R1.0	3.0	6	4.5	10	50	2.85	-
SEME610301012	R1.0	3.0	6	4.5	12	50	2.85	-
SEME610301014	R1.0	3.0	6	4.5	14	60	2.85	-
SEME610301016	R1.0	3.0	6	4.5	16	60	2.85	-
SEME610301020	R1.0	3.0	6	4.5	20	60	2.85	-
SEME610301026	R1.0	3.0	6	4.5	26	65	2.85	-
SEME610301030	R1.0	3.0	6	4.5	30	70	2.85	-
SEME610301035	R1.0	3.0	6	4.5	35	70	2.85	-
SEME610301040	R1.0	3.0	6	4.5	40	80	2.85	-
SEME610400110	R0.1	4.0	6	6	10	50	3.85	-
SEME610400112	R0.1	4.0	6	6	12	50	3.85	-
SEME610400114	R0.1	4.0	6	6	14	60	3.85	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

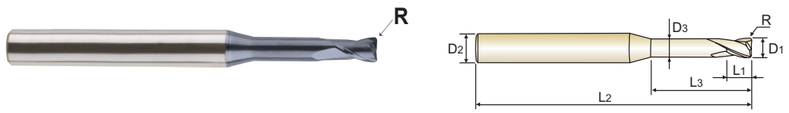
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Available various products like regular length and long shank end mills etc.
- ▶Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- ▶Available more various effective length and overall length end mills than previous standard products.



CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610400116	R0.1	4.0	6	6	16	60	3.85	-
SEME610400120	R0.1	4.0	6	6	20	60	3.85	-
SEME610400126	R0.1	4.0	6	6	26	65	3.85	-
SEME610400130	R0.1	4.0	6	6	30	70	3.85	-
SEME610400135	R0.1	4.0	6	6	35	70	3.85	-
SEME610400140	R0.1	4.0	6	6	40	80	3.85	-
SEME610400145	R0.1	4.0	6	6	45	90	3.85	-
SEME610400150	R0.1	4.0	6	6	50	100	3.85	-
SEME610400210	R0.2	4.0	6	6	10	50	3.85	-
SEME610400212	R0.2	4.0	6	6	12	50	3.85	-
SEME610400214	R0.2	4.0	6	6	14	60	3.85	-
SEME610400216	R0.2	4.0	6	6	16	60	3.85	-
SEME610400220	R0.2	4.0	6	6	20	60	3.85	-
SEME610400226	R0.2	4.0	6	6	26	65	3.85	-
SEME610400230	R0.2	4.0	6	6	30	70	3.85	-
SEME610400235	R0.2	4.0	6	6	35	70	3.85	-
SEME610400240	R0.2	4.0	6	6	40	80	3.85	-
SEME610400245	R0.2	4.0	6	6	45	90	3.85	-
SEME610400250	R0.2	4.0	6	6	50	100	3.85	-
SEME610400310	R0.3	4.0	6	6	10	50	3.85	-
SEME610400312	R0.3	4.0	6	6	12	50	3.85	-
SEME610400314	R0.3	4.0	6	6	14	50	3.85	-
SEME610400316	R0.3	4.0	6	6	16	50	3.85	-
SEME610400320	R0.3	4.0	6	6	20	50	3.85	-
SEME610400326	R0.3	4.0	6	6	26	65	3.85	-
SEME610400330	R0.3	4.0	6	6	30	70	3.85	-
SEME610400335	R0.3	4.0	6	6	35	70	3.85	-
SEME610400340	R0.3	4.0	6	6	40	80	3.85	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS
PLAIN SHANK SEME61 SERIES
CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS
▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
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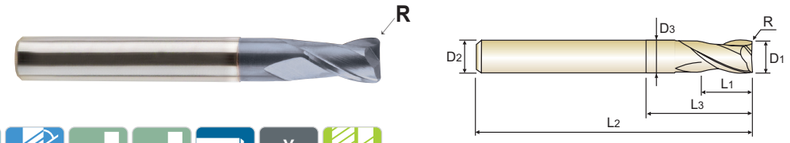

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating
p.C388
◇ Call for Availability
Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME610400345	R0.3	4.0	6	6	45	90	3.85	-
SEME610400350	R0.3	4.0	6	6	50	100	3.85	-
SEME610400510	R0.5	4.0	6	6	10	50	3.85	-
SEME610400512	R0.5	4.0	6	6	12	50	3.85	-
SEME610400514	R0.5	4.0	6	6	14	60	3.85	-
SEME610400516	R0.5	4.0	6	6	16	60	3.85	-
SEME610400520	R0.5	4.0	6	6	20	60	3.85	-
SEME610400526	R0.5	4.0	6	6	26	65	3.85	-
SEME610400530	R0.5	4.0	6	6	30	70	3.85	-
SEME610400535	R0.5	4.0	6	6	35	70	3.85	-
SEME610400540	R0.5	4.0	6	6	40	80	3.85	-
SEME610400545	R0.5	4.0	6	6	45	90	3.85	-
SEME610400550	R0.5	4.0	6	6	50	100	3.85	-
SEME610401010	R1.0	4.0	6	6	10	50	3.85	-
SEME610401012	R1.0	4.0	6	6	12	50	3.85	-
SEME610401014	R1.0	4.0	6	6	14	60	3.85	-
SEME610401016	R1.0	4.0	6	6	16	60	3.85	-
SEME610401020	R1.0	4.0	6	6	20	60	3.85	-
SEME610401026	R1.0	4.0	6	6	26	65	3.85	-
SEME610401030	R1.0	4.0	6	6	30	70	3.85	-
SEME610401035	R1.0	4.0	6	6	35	70	3.85	-
SEME610401040	R1.0	4.0	6	6	40	80	3.85	-
SEME610401045	R1.0	4.0	6	6	45	90	3.85	-
SEME610401050	R1.0	4.0	6	6	50	100	3.85	-
SEME6105001	R0.1	5.0	6	8	15	60	4.85	-
SEME6105002	R0.2	5.0	6	8	15	60	4.85	-
SEME6105003	R0.3	5.0	6	8	15	60	4.85	-
SEME6105005	R0.5	5.0	6	8	15	60	4.85	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

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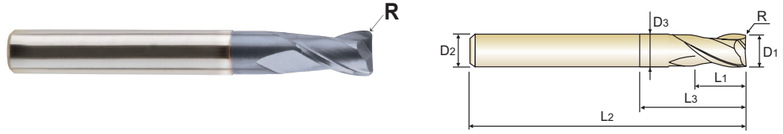

CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6105010	R1.0	**5.0**	6	8	15	60	4.85	-
SEME6105015	R1.5	**5.0**	6	8	15	60	4.85	-
SEME6105020	R2.0	**5.0**	6	8	15	60	4.85	-
SEME6106001	R0.1	**6.0**	6	9	20	60	5.85	Regular
SEME6106002	R0.2	**6.0**	6	9	20	60	5.85	Regular
SEME6106003	R0.3	**6.0**	6	9	20	60	5.85	Regular
SEME6106005	R0.5	**6.0**	6	9	20	60	5.85	Regular
SEME6106010	R1.0	**6.0**	6	9	20	60	5.85	Regular
SEME6106015	R1.5	**6.0**	6	9	20	60	5.85	Regular
SEME6106020	R2.0	**6.0**	6	9	20	60	5.85	Regular
SEME6106003090	R0.3	**6.0**	6	15	30	90	5.85	Long Shank
SEME6106005090	R0.5	**6.0**	6	15	30	90	5.85	Long Shank
SEME6106010090	R1.0	**6.0**	6	15	30	90	5.85	Long Shank
SEME6108001	R0.1	**8.0**	8	12	25	70	7.70	Regular
SEME6108002	R0.2	**8.0**	8	12	25	70	7.70	Regular
SEME6108003	R0.3	**8.0**	8	12	25	70	7.70	Regular
SEME6108005	R0.5	**8.0**	8	12	25	70	7.70	Regular
SEME6108010	R1.0	**8.0**	8	12	25	70	7.70	Regular
SEME6108015	R1.5	**8.0**	8	12	25	70	7.70	Regular
SEME6108020	R2.0	**8.0**	8	12	25	70	7.70	Regular
SEME6108003100	R0.3	**8.0**	8	20	35	100	7.70	Long Shank
SEME6108005100	R0.5	**8.0**	8	20	35	100	7.70	Long Shank
SEME6108010100	R1.0	**8.0**	8	20	35	100	7.70	Long Shank
SEME6110001	R0.1	**10.0**	10	15	30	75	9.70	Regular
SEME6110002	R0.2	**10.0**	10	15	30	75	9.70	Regular
SEME6110003	R0.3	**10.0**	10	15	30	75	9.70	Regular
SEME6110005	R0.5	**10.0**	10	15	30	75	9.70	Regular
SEME6110010	R1.0	**10.0**	10	15	30	75	9.70	Regular

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME61** SERIES

CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

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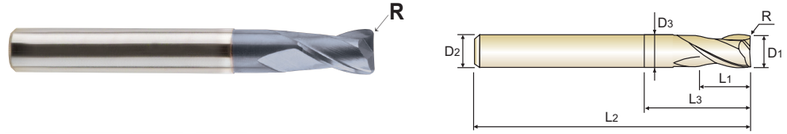


CARBIDE | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN | Y Coating

p.C388

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6110015	R1.5	**10.0**	10	15	30	75	9.70	Regular
SEME6110020	R2.0	**10.0**	10	15	30	75	9.70	Regular
SEME6110003100	R0.3	**10.0**	10	25	40	100	9.70	Long Shank
SEME6110005100	R0.5	**10.0**	10	25	40	100	9.70	Long Shank
SEME6110010100	R1.0	**10.0**	10	25	40	100	9.70	Long Shank
SEME6112002	R0.2	**12.0**	12	18	32	80	11.70	Regular
SEME6112003	R0.3	**12.0**	12	18	32	80	11.70	Regular
SEME6112005	R0.5	**12.0**	12	18	32	80	11.70	Regular
SEME6112010	R1.0	**12.0**	12	18	32	80	11.70	Regular
SEME6112015	R1.5	**12.0**	12	18	32	80	11.70	Regular
SEME6112020	R2.0	**12.0**	12	18	32	80	11.70	Regular
SEME6112003110	R0.3	**12.0**	12	30	50	110	11.70	Long Shank
SEME6112005110	R0.5	**12.0**	12	30	50	110	11.70	Long Shank
SEME6112010110	R1.0	**12.0**	12	30	50	110	11.70	Long Shank
SEME6116005	R0.5	**16.0**	16	20	35	100	15.70	Regular
SEME6116010	R1.0	**16.0**	16	20	35	100	15.70	Regular
SEME6116005150	R0.5	**16.0**	16	35	50	150	15.70	Long Shank
SEME6116010150	R1.0	**16.0**	16	35	50	150	15.70	Long Shank
SEME6120005	R0.5	**20.0**	20	25	40	100	19.70	Regular
SEME6120010	R1.0	**20.0**	20	25	40	100	19.70	Regular
SEME6120005150	R0.5	**20.0**	20	40	55	150	19.70	Long Shank
SEME6120010150	R1.0	**20.0**	20	40	55	150	19.70	Long Shank

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	±0.010	0~-0.012	h5
over Ø6	±0.015	0~-0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

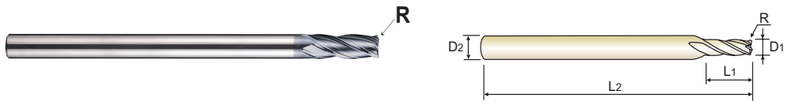
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶Available various products like short, regular and long shank end millls etc.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C395

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME01010005	R0.05	1.0	6	2.5	50	-
SEME0101001	R0.1	1.0	6	2.5	50	-
SEME0101002	R0.2	1.0	6	2.5	50	-
SEME0101003	R0.3	1.0	6	2.5	50	-
SEME01012005	R0.05	1.2	6	3	50	-
SEME0101201	R0.1	1.2	6	3	50	-
SEME0101202	R0.2	1.2	6	3	50	-
SEME0101203	R0.3	1.2	6	3	50	-
SEME01015005	R0.05	1.5	6	4	50	-
SEME0101501	R0.1	1.5	6	4	50	-
SEME0101502	R0.2	1.5	6	4	50	-
SEME0101503	R0.3	1.5	6	4	50	-
SEME0101505	R0.5	1.5	6	4	50	-
SEME0102001	R0.1	2.0	6	6	50	-
SEME0102002	R0.2	2.0	6	6	50	-
SEME0102003	R0.3	2.0	6	6	50	-
SEME0102005	R0.5	2.0	6	6	50	-
SEME0102501	R0.1	2.5	6	7	60	-
SEME0102502	R0.2	2.5	6	7	60	-
SEME0102503	R0.3	2.5	6	7	60	-
SEME0102505	R0.5	2.5	6	7	60	-
SEME0103001	R0.1	3.0	6	8	60	-
SEME0103002	R0.2	3.0	6	8	60	-
SEME0103003	R0.3	3.0	6	8	60	-
SEME0103005	R0.5	3.0	6	8	60	-
SEME0103010	R1.0	3.0	6	8	60	-
SEME0103501	R0.1	3.5	6	10	70	-
SEME0103502	R0.2	3.5	6	10	70	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶Available various products like short, regular and long shank end millls etc.

CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C395

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0103503	R0.3	3.5	6	10	70	-
SEME0103505	R0.5	3.5	6	10	70	-
SEME01040014S	R0.1	4.0	4	10	70	4mm Shank
SEME01040024S	R0.2	4.0	4	10	70	4mm Shank
SEME01040034S	R0.3	4.0	4	10	70	4mm Shank
SEME01040054S	R0.5	4.0	4	10	70	4mm Shank
SEME01040104S	R1.0	4.0	4	10	70	4mm Shank
SEME010400011004S	R0.1	4.0	4	10	100	4mm Shank
SEME010400021004S	R0.2	4.0	4	10	100	4mm Shank
SEME010400031004S	R0.3	4.0	4	10	100	4mm Shank
SEME010400051004S	R0.5	4.0	4	10	100	4mm Shank
SEME010401011004S	R1.0	4.0	4	10	100	4mm Shank
SEME0104001	R0.1	4.0	6	10	70	Regular
SEME0104002	R0.2	4.0	6	10	70	Regular
SEME0104003	R0.3	4.0	6	10	70	Regular
SEME0104005	R0.5	4.0	6	10	70	Regular
SEME0104010	R1.0	4.0	6	10	70	Regular
SEME0104501	R0.1	4.5	6	11	80	-
SEME0104502	R0.2	4.5	6	11	80	-
SEME0104503	R0.3	4.5	6	11	80	-
SEME0104505	R0.5	4.5	6	11	80	-
SEME0105001	R0.1	5.0	6	13	90	-
SEME0105002	R0.2	5.0	6	13	90	-
SEME0105003	R0.3	5.0	6	13	90	-
SEME0105005	R0.5	5.0	6	13	90	-
SEME0105010	R1.0	5.0	6	13	90	-
SEME0105501	R0.1	5.5	6	13	90	-
SEME0105502	R0.2	5.5	6	13	90	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶Available various products like short, regular and long shank end millls etc.

CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C395

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0105503	R0.3	5.5	6	13	90	-
SEME0105505	R0.5	5.5	6	13	90	-
SEME0105510	R1.0	5.5	6	13	90	-
SEME0106001060	R0.1	6.0	6	15	60	Short
SEME0106002060	R0.2	6.0	6	15	60	Short
SEME0106001	R0.1	6.0	6	15	90	Regular
SEME0106002	R0.2	6.0	6	15	90	Regular
SEME0106003	R0.3	6.0	6	15	90	Regular
SEME0106005	R0.5	6.0	6	15	90	Regular
SEME0106010	R1.0	6.0	6	15	90	Regular
SEME0106015	R1.5	6.0	6	15	90	Regular
SEME0106020	R2.0	6.0	6	15	90	Regular
SEME0106005110	R0.5	6.0	6	15	110	Long Shank
SEME0106010110	R1.0	6.0	6	15	110	Long Shank
SEME0106005130	R0.5	6.0	6	15	130	Long Shank
SEME0106010130	R1.0	6.0	6	15	130	Long Shank
SEME0107001	R0.1	7.0	8	16	90	-
SEME0107002	R0.2	7.0	8	16	90	-
SEME0107003	R0.3	7.0	8	16	90	-
SEME0107005	R0.5	7.0	8	16	90	-
SEME0107010	R1.0	7.0	8	16	90	-
SEME0107020	R2.0	7.0	8	16	90	-
SEME0108003070	R0.3	8.0	8	20	70	Short
SEME0108005070	R0.5	8.0	8	20	70	Short
SEME0108010070	R1.0	8.0	8	20	70	Short
SEME0108001	R0.1	8.0	8	20	100	Regular
SEME0108002	R0.2	8.0	8	20	100	Regular
SEME0108003	R0.3	8.0	8	20	100	Regular

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
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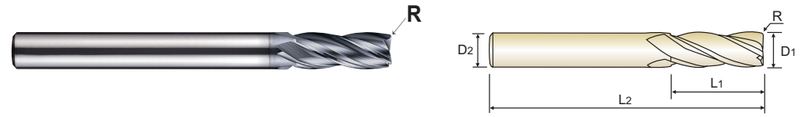

CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C395

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Remark
	R	D1	D2	L1	L2	
SEME0108005	R0.5	8.0	8	20	100	Regular
SEME0108010	R1.0	8.0	8	20	100	Regular
SEME0108015	R1.5	8.0	8	20	100	Regular
SEME0108020	R2.0	8.0	8	20	100	Regular
SEME0108025	R2.5	8.0	8	20	100	Regular
SEME0108030	R3.0	8.0	8	20	100	Regular
SEME0108005120	R0.5	8.0	8	20	120	Long Shank
SEME0108010120	R1.0	8.0	8	20	120	Long Shank
SEME0108005150	R0.5	8.0	8	20	150	Long Shank
SEME0108010150	R1.0	8.0	8	20	150	Long Shank
SEME0110003075	R0.3	10.0	10	25	75	Short
SEME0110005075	R0.5	10.0	10	25	75	Short
SEME0110010075	R1.0	10.0	10	25	75	Short
SEME0110001	R0.1	10.0	10	25	100	Regular
SEME0110002	R0.2	10.0	10	25	100	Regular
SEME0110003	R0.3	10.0	10	25	100	Regular
SEME0110005	R0.5	10.0	10	25	100	Regular
SEME0110010	R1.0	10.0	10	25	100	Regular
SEME0110015	R1.5	10.0	10	25	100	Regular
SEME0110020	R2.0	10.0	10	25	100	Regular
SEME0110025	R2.5	10.0	10	25	100	Regular
SEME0110030	R3.0	10.0	10	25	100	Regular
SEME0110040	R4.0	10.0	10	25	100	Regular
SEME0110005130	R0.5	10.0	10	22	130	Long Shank
SEME0110010130	R1.0	10.0	10	22	130	Long Shank
SEME0110005150	R0.5	10.0	10	22	150	Long Shank
SEME0110010150	R1.0	10.0	10	22	150	Long Shank
SEME0111002	R0.2	11.0	12	25	110	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
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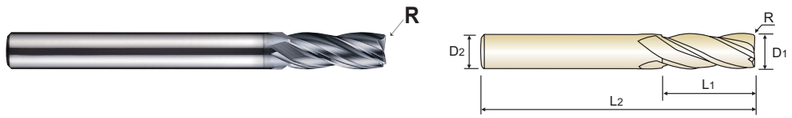


CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C395

D1<Ø3.0, 30° Helix

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0111003	R0.3	11.0	12	25	110	-
SEME0111005	R0.5	11.0	12	25	110	-
SEME0111010	R1.0	11.0	12	25	110	-
SEME0111020	R2.0	11.0	12	25	110	-
SEME0112003080	R0.3	12.0	12	30	80	Short
SEME0112005080	R0.5	12.0	12	30	80	Short
SEME0112010080	R1.0	12.0	12	30	80	Short
SEME0112001	R0.1	12.0	12	30	110	Regular
SEME0112002	R0.2	12.0	12	30	110	Regular
SEME0112003	R0.3	12.0	12	30	110	Regular
SEME0112005	R0.5	12.0	12	30	110	Regular
SEME0112010	R1.0	12.0	12	30	110	Regular
SEME0112015	R1.5	12.0	12	30	110	Regular
SEME0112020	R2.0	12.0	12	30	110	Regular
SEME0112025	R2.5	12.0	12	30	110	Regular
SEME0112030	R3.0	12.0	12	30	110	Regular
SEME0112040	R4.0	12.0	12	30	110	Regular
SEME0112050	R5.0	12.0	12	30	110	Regular
SEME0112005130	R0.5	12.0	12	30	130	Long Shank
SEME0112010130	R1.0	12.0	12	30	130	Long Shank
SEME0112005150	R0.5	12.0	12	30	130	Long Shank
SEME0112010150	R1.0	12.0	12	30	130	Long Shank
SEME0114005	R0.5	14.0	16	35	150	-
SEME0114010	R1.0	14.0	16	35	150	-
SEME0114020	R2.0	14.0	16	35	150	-
SEME0116005	R0.5	16.0	16	32	150	-
SEME0116010	R1.0	16.0	16	32	150	-
SEME0116015	R1.5	16.0	16	32	150	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

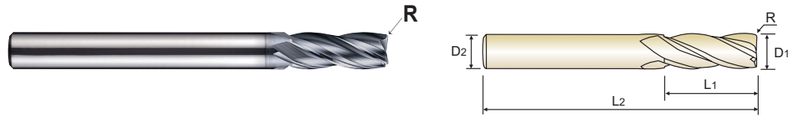
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME01** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶Available various products like short, regular and long shank end millls etc.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C395

D1<Ø3.0, 30° Helix

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME0116020	R2.0	16.0	16	32	150	-
SEME0120005	R0.5	20.0	20	38	150	-
SEME0120010	R1.0	20.0	20	38	150	-
SEME0120015	R1.5	20.0	20	38	150	-
SEME0120020	R2.0	20.0	20	38	150	-

Mill Dia. Tolerance (mm)	Corner Radius Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	±0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

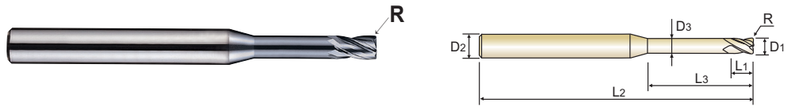
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6401000503	R0.05	1.0	4	1.5	3	50	0.95	-
SEME6401000504	R0.05	1.0	4	1.5	4	50	0.95	-
SEME6401000506	R0.05	1.0	4	1.5	6	50	0.95	-
SEME6401000508	R0.05	1.0	4	1.5	8	50	0.95	-
SEME6401000510	R0.05	1.0	4	1.5	10	50	0.95	-
SEME6401000512	R0.05	1.0	4	1.5	12	50	0.95	-
SEME6401000514	R0.05	1.0	4	1.5	14	50	0.95	-
SEME6401000516	R0.05	1.0	4	1.5	16	50	0.95	-
SEME6401000520	R0.05	1.0	4	1.5	20	50	0.95	-
SEME640100103	R0.1	1.0	4	1.5	3	50	0.95	-
SEME640100104	R0.1	1.0	4	1.5	4	50	0.95	-
SEME640100106	R0.1	1.0	4	1.5	6	50	0.95	-
SEME640100108	R0.1	1.0	4	1.5	8	50	0.95	-
SEME640100110	R0.1	1.0	4	1.5	10	50	0.95	-
SEME640100112	R0.1	1.0	4	1.5	12	50	0.95	-
SEME640100114	R0.1	1.0	4	1.5	14	50	0.95	-
SEME640100116	R0.1	1.0	4	1.5	16	50	0.95	-
SEME640100120	R0.1	1.0	4	1.5	20	50	0.95	-
SEME640100203	R0.2	1.0	4	1.5	3	50	0.95	-
SEME640100204	R0.2	1.0	4	1.5	4	50	0.95	-
SEME640100206	R0.2	1.0	4	1.5	6	50	0.95	-
SEME640100208	R0.2	1.0	4	1.5	8	50	0.95	-
SEME640100210	R0.2	1.0	4	1.5	10	50	0.95	-
SEME640100212	R0.2	1.0	4	1.5	12	50	0.95	-
SEME640100214	R0.2	1.0	4	1.5	14	50	0.95	-
SEME640100216	R0.2	1.0	4	1.5	16	50	0.95	-
SEME640100220	R0.2	1.0	4	1.5	20	50	0.95	-
SEME640100303	R0.3	1.0	4	1.5	3	50	0.95	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.

CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640100304	R0.3	1.0	4	1.5	4	50	0.95	-
SEME640100306	R0.3	1.0	4	1.5	6	50	0.95	-
SEME640100308	R0.3	1.0	4	1.5	8	50	0.95	-
SEME640100310	R0.3	1.0	4	1.5	10	50	0.95	-
SEME640100312	R0.3	1.0	4	1.5	12	50	0.95	-
SEME640100314	R0.3	1.0	4	1.5	14	50	0.95	-
SEME640100316	R0.3	1.0	4	1.5	16	50	0.95	-
SEME640100320	R0.3	1.0	4	1.5	20	50	0.95	-
SEME6401200503	R0.05	1.2	4	1.8	3	50	1.15	-
SEME6401200504	R0.05	1.2	4	1.8	4	50	1.15	-
SEME6401200506	R0.05	1.2	4	1.8	6	50	1.15	-
SEME6401200508	R0.05	1.2	4	1.8	8	50	1.15	-
SEME6401200510	R0.05	1.2	4	1.8	10	50	1.15	-
SEME6401200512	R0.05	1.2	4	1.8	12	50	1.15	-
SEME6401200516	R0.05	1.2	4	1.8	16	50	1.15	-
SEME6401200520	R0.05	1.2	4	1.8	20	50	1.15	-
SEME640120103	R0.1	1.2	4	1.8	3	50	1.15	-
SEME640120104	R0.1	1.2	4	1.8	4	50	1.15	-
SEME640120106	R0.1	1.2	4	1.8	6	50	1.15	-
SEME640120108	R0.1	1.2	4	1.8	8	50	1.15	-
SEME640120110	R0.1	1.2	4	1.8	10	50	1.15	-
SEME640120112	R0.1	1.2	4	1.8	12	50	1.15	-
SEME640120116	R0.1	1.2	4	1.8	16	50	1.15	-
SEME640120120	R0.1	1.2	4	1.8	20	50	1.15	-
SEME640120203	R0.2	1.2	4	1.8	3	50	1.15	-
SEME640120204	R0.2	1.2	4	1.8	4	50	1.15	-
SEME640120206	R0.2	1.2	4	1.8	6	50	1.15	-
SEME640120208	R0.2	1.2	4	1.8	8	50	1.15	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

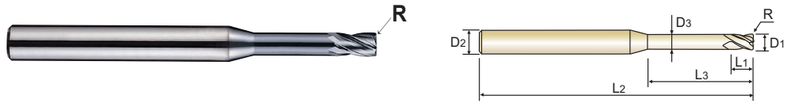
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640120210	R0.2	1.2	4	1.8	10	50	1.15	-
SEME640120212	R0.2	1.2	4	1.8	12	50	1.15	-
SEME640120216	R0.2	1.2	4	1.8	16	50	1.15	-
SEME640120220	R0.2	1.2	4	1.8	20	50	1.15	-
SEME640120303	R0.3	1.2	4	1.8	3	50	1.15	-
SEME640120304	R0.3	1.2	4	1.8	4	50	1.15	-
SEME640120306	R0.3	1.2	4	1.8	6	50	1.15	-
SEME640120308	R0.3	1.2	4	1.8	8	50	1.15	-
SEME640120310	R0.3	1.2	4	1.8	10	50	1.15	-
SEME640120312	R0.3	1.2	4	1.8	12	50	1.15	-
SEME640120316	R0.3	1.2	4	1.8	16	50	1.15	-
SEME640120320	R0.3	1.2	4	1.8	20	50	1.15	-
SEME6401500504	R0.05	1.5	4	2.3	4	50	1.45	-
SEME6401500506	R0.05	1.5	4	2.3	6	50	1.45	-
SEME6401500508	R0.05	1.5	4	2.3	8	50	1.45	-
SEME6401500510	R0.05	1.5	4	2.3	10	50	1.45	-
SEME6401500512	R0.05	1.5	4	2.3	12	50	1.45	-
SEME6401500514	R0.05	1.5	4	2.3	14	50	1.45	-
SEME6401500516	R0.05	1.5	4	2.3	16	50	1.45	-
SEME6401500520	R0.05	1.5	4	2.3	20	50	1.45	-
SEME6401500522	R0.05	1.5	4	2.3	22	60	1.45	-
SEME6401500526	R0.05	1.5	4	2.3	26	60	1.45	-
SEME640150104	R0.1	1.5	4	2.3	4	50	1.45	-
SEME640150106	R0.1	1.5	4	2.3	6	50	1.45	-
SEME640150108	R0.1	1.5	4	2.3	8	50	1.45	-
SEME640150110	R0.1	1.5	4	2.3	10	50	1.45	-
SEME640150112	R0.1	1.5	4	2.3	12	50	1.45	-
SEME640150114	R0.1	1.5	4	2.3	14	50	1.45	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

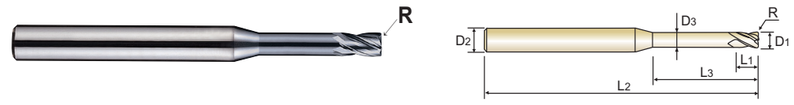
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640150116	R0.1	1.5	4	2.3	16	50	1.45	-
SEME640150120	R0.1	1.5	4	2.3	20	50	1.45	-
SEME640150122	R0.1	1.5	4	2.3	22	60	1.45	-
SEME640150126	R0.1	1.5	4	2.3	26	60	1.45	-
SEME640150204	R0.2	1.5	4	2.3	4	50	1.45	-
SEME640150206	R0.2	1.5	4	2.3	6	50	1.45	-
SEME640150208	R0.2	1.5	4	2.3	8	50	1.45	-
SEME640150210	R0.2	1.5	4	2.3	10	50	1.45	-
SEME640150212	R0.2	1.5	4	2.3	12	50	1.45	-
SEME640150214	R0.2	1.5	4	2.3	14	50	1.45	-
SEME640150216	R0.2	1.5	4	2.3	16	50	1.45	-
SEME640150220	R0.2	1.5	4	2.3	20	50	1.45	-
SEME640150222	R0.2	1.5	4	2.3	22	60	1.45	-
SEME640150226	R0.2	1.5	4	2.3	26	60	1.45	-
SEME640150304	R0.3	1.5	4	2.3	4	50	1.45	-
SEME640150306	R0.3	1.5	4	2.3	6	50	1.45	-
SEME640150308	R0.3	1.5	4	2.3	8	50	1.45	-
SEME640150310	R0.3	1.5	4	2.3	10	50	1.45	-
SEME640150312	R0.3	1.5	4	2.3	12	50	1.45	-
SEME640150314	R0.3	1.5	4	2.3	14	50	1.45	-
SEME640150316	R0.3	1.5	4	2.3	16	50	1.45	-
SEME640150320	R0.3	1.5	4	2.3	20	50	1.45	-
SEME640150322	R0.3	1.5	4	2.3	22	60	1.45	-
SEME640150326	R0.3	1.5	4	2.3	26	60	1.45	-
SEME640150504	R0.5	1.5	4	2.3	4	50	1.45	-
SEME640150506	R0.5	1.5	4	2.3	6	50	1.45	-
SEME640150508	R0.5	1.5	4	2.3	8	50	1.45	-
SEME640150510	R0.5	1.5	4	2.3	10	50	1.45	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

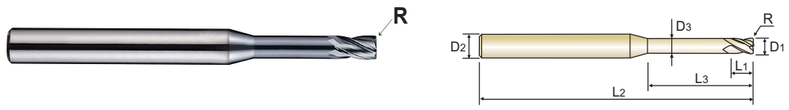
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640150512	R0.5	1.5	4	2.3	12	50	1.45	-
SEME640150514	R0.5	1.5	4	2.3	14	50	1.45	-
SEME640150516	R0.5	1.5	4	2.3	16	50	1.45	-
SEME640150520	R0.5	1.5	4	2.3	20	50	1.45	-
SEME640150522	R0.5	1.5	4	2.3	22	60	1.45	-
SEME640150526	R0.5	1.5	4	2.3	26	60	1.45	-
SEME640200106	R0.1	2.0	4	3	6	50	1.95	-
SEME640200108	R0.1	2.0	4	3	8	50	1.95	-
SEME640200110	R0.1	2.0	4	3	10	50	1.95	-
SEME640200112	R0.1	2.0	4	3	12	50	1.95	-
SEME640200114	R0.1	2.0	4	3	14	50	1.95	-
SEME640200116	R0.1	2.0	4	3	16	50	1.95	-
SEME640200120	R0.1	2.0	4	3	20	50	1.95	-
SEME640200122	R0.1	2.0	4	3	22	60	1.95	-
SEME640200126	R0.1	2.0	4	3	26	60	1.95	-
SEME640200130	R0.1	2.0	4	3	30	70	1.95	-
SEME640200206	R0.2	2.0	4	3	6	50	1.95	-
SEME640200208	R0.2	2.0	4	3	8	50	1.95	-
SEME640200210	R0.2	2.0	4	3	10	50	1.95	-
SEME640200212	R0.2	2.0	4	3	12	50	1.95	-
SEME640200214	R0.2	2.0	4	3	14	50	1.95	-
SEME640200216	R0.2	2.0	4	3	16	50	1.95	-
SEME640200220	R0.2	2.0	4	3	20	50	1.95	-
SEME640200222	R0.2	2.0	4	3	22	60	1.95	-
SEME640200226	R0.2	2.0	4	3	26	60	1.95	-
SEME640200230	R0.2	2.0	4	3	30	70	1.95	-
SEME640200306	R0.3	2.0	4	3	6	50	1.95	-
SEME640200308	R0.3	2.0	4	3	8	50	1.95	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

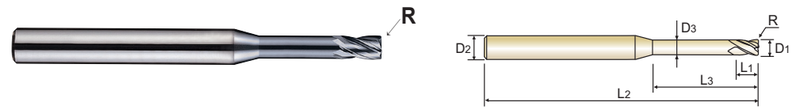
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640200310	R0.3	2.0	4	3	10	50	1.95	-
SEME640200312	R0.3	2.0	4	3	12	50	1.95	-
SEME640200314	R0.3	2.0	4	3	14	50	1.95	-
SEME640200316	R0.3	2.0	4	3	16	50	1.95	-
SEME640200320	R0.3	2.0	4	3	20	50	1.95	-
SEME640200322	R0.3	2.0	4	3	22	60	1.95	-
SEME640200326	R0.3	2.0	4	3	26	60	1.95	-
SEME640200330	R0.3	2.0	4	3	30	70	1.95	-
SEME640200506	R0.5	2.0	4	3	6	50	1.95	-
SEME640200508	R0.5	2.0	4	3	8	50	1.95	-
SEME640200510	R0.5	2.0	4	3	10	50	1.95	-
SEME640200512	R0.5	2.0	4	3	12	50	1.95	-
SEME640200514	R0.5	2.0	4	3	14	50	1.95	-
SEME640200516	R0.5	2.0	4	3	16	50	1.95	-
SEME640200520	R0.5	2.0	4	3	20	50	1.95	-
SEME640200522	R0.5	2.0	4	3	22	60	1.95	-
SEME640200526	R0.5	2.0	4	3	26	60	1.95	-
SEME640200530	R0.5	2.0	4	3	30	70	1.95	-
SEME640250108	R0.1	2.5	4	4	8	50	2.40	-
SEME640250110	R0.1	2.5	4	4	10	50	2.40	-
SEME640250112	R0.1	2.5	4	4	12	50	2.40	-
SEME640250114	R0.1	2.5	4	4	14	50	2.40	-
SEME640250116	R0.1	2.5	4	4	16	50	2.40	-
SEME640250120	R0.1	2.5	4	4	20	50	2.40	-
SEME640250126	R0.1	2.5	4	4	26	60	2.40	-
SEME640250130	R0.1	2.5	4	4	30	70	2.40	-
SEME640250208	R0.2	2.5	4	4	8	50	2.40	-
SEME640250210	R0.2	2.5	4	4	10	50	2.40	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

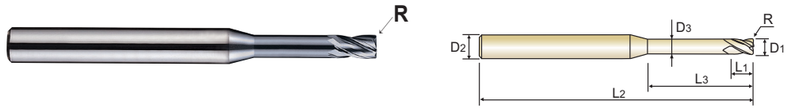
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME640250212	R0.2	2.5	4	4	12	50	2.40	-
SEME640250214	R0.2	2.5	4	4	14	50	2.40	-
SEME640250216	R0.2	2.5	4	4	16	50	2.40	-
SEME640250220	R0.2	2.5	4	4	20	50	2.40	-
SEME640250226	R0.2	2.5	4	4	26	60	2.40	-
SEME640250230	R0.2	2.5	4	4	30	70	2.40	-
SEME640250308	R0.3	2.5	4	4	8	50	2.40	-
SEME640250310	R0.3	2.5	4	4	10	50	2.40	-
SEME640250312	R0.3	2.5	4	4	12	50	2.40	-
SEME640250314	R0.3	2.5	4	4	14	50	2.40	-
SEME640250316	R0.3	2.5	4	4	16	50	2.40	-
SEME640250320	R0.3	2.5	4	4	20	50	2.40	-
SEME640250326	R0.3	2.5	4	4	26	60	2.40	-
SEME640250330	R0.3	2.5	4	4	30	70	2.40	-
SEME640250508	R0.5	2.5	4	4	8	50	2.40	-
SEME640250510	R0.5	2.5	4	4	10	50	2.40	-
SEME640250512	R0.5	2.5	4	4	12	50	2.40	-
SEME640250514	R0.5	2.5	4	4	14	50	2.40	-
SEME640250516	R0.5	2.5	4	4	16	50	2.40	-
SEME640250520	R0.5	2.5	4	4	20	50	2.40	-
SEME640250526	R0.5	2.5	4	4	26	60	2.40	-
SEME640250530	R0.5	2.5	4	4	30	70	2.40	-
SEME640300108	R0.1	3.0	6	4.5	8	50	2.85	-
SEME640300110	R0.1	3.0	6	4.5	10	50	2.85	-
SEME640300112	R0.1	3.0	6	4.5	12	50	2.85	-
SEME640300114	R0.1	3.0	6	4.5	14	60	2.85	-
SEME640300116	R0.1	3.0	6	4.5	16	60	2.85	-
SEME640300120	R0.1	3.0	6	4.5	20	60	2.85	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

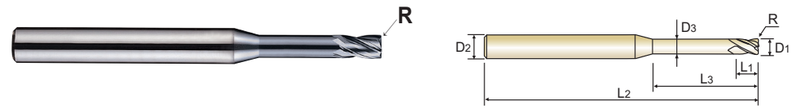
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK SEME64 SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Remark
	R	D1	D2	L1	L3	L2	D3	
SEME640300126	R0.1	3.0	6	4.5	26	65	2.85	-
SEME640300130	R0.1	3.0	6	4.5	30	70	2.85	-
SEME640300135	R0.1	3.0	6	4.5	35	70	2.85	-
SEME640300140	R0.1	3.0	6	4.5	40	80	2.85	-
SEME640300208	R0.2	3.0	6	4.5	8	50	2.85	-
SEME640300210	R0.2	3.0	6	4.5	10	50	2.85	-
SEME640300212	R0.2	3.0	6	4.5	12	50	2.85	-
SEME640300214	R0.2	3.0	6	4.5	14	60	2.85	-
SEME640300216	R0.2	3.0	6	4.5	16	60	2.85	-
SEME640300220	R0.2	3.0	6	4.5	20	60	2.85	-
SEME640300226	R0.2	3.0	6	4.5	26	65	2.85	-
SEME640300230	R0.2	3.0	6	4.5	30	70	2.85	-
SEME640300235	R0.2	3.0	6	4.5	35	70	2.85	-
SEME640300240	R0.2	3.0	6	4.5	40	80	2.85	-
SEME640300308	R0.3	3.0	6	4.5	8	50	2.85	-
SEME640300310	R0.3	3.0	6	4.5	10	50	2.85	-
SEME640300312	R0.3	3.0	6	4.5	12	50	2.85	-
SEME640300314	R0.3	3.0	6	4.5	14	60	2.85	-
SEME640300316	R0.3	3.0	6	4.5	16	60	2.85	-
SEME640300320	R0.3	3.0	6	4.5	20	60	2.85	-
SEME640300326	R0.3	3.0	6	4.5	26	65	2.85	-
SEME640300330	R0.3	3.0	6	4.5	30	70	2.85	-
SEME640300335	R0.3	3.0	6	4.5	35	70	2.85	-
SEME640300340	R0.3	3.0	6	4.5	40	80	2.85	-
SEME640300508	R0.5	3.0	6	4.5	8	50	2.85	-
SEME640300510	R0.5	3.0	6	4.5	10	50	2.85	-
SEME640300512	R0.5	3.0	6	4.5	12	50	2.85	-
SEME640300514	R0.5	3.0	6	4.5	14	60	2.85	-

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

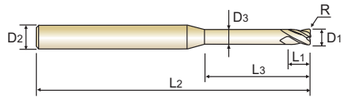
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640300516	R0.5	3.0	6	4.5	16	60	2.85	-
SEME640300520	R0.5	3.0	6	4.5	20	60	2.85	-
SEME640300526	R0.5	3.0	6	4.5	26	65	2.85	-
SEME640300530	R0.5	3.0	6	4.5	30	70	2.85	-
SEME640300535	R0.5	3.0	6	4.5	35	70	2.85	-
SEME640300540	R0.5	3.0	6	4.5	40	80	2.85	-
SEME640301008	R1.0	3.0	6	4.5	8	50	2.85	-
SEME640301010	R1.0	3.0	6	4.5	10	50	2.85	-
SEME640301012	R1.0	3.0	6	4.5	12	50	2.85	-
SEME640301014	R1.0	3.0	6	4.5	14	60	2.85	-
SEME640301016	R1.0	3.0	6	4.5	16	60	2.85	-
SEME640301020	R1.0	3.0	6	4.5	20	60	2.85	-
SEME640301026	R1.0	3.0	6	4.5	26	65	2.85	-
SEME640301030	R1.0	3.0	6	4.5	30	70	2.85	-
SEME640301035	R1.0	3.0	6	4.5	35	70	2.85	-
SEME640301040	R1.0	3.0	6	4.5	40	80	2.85	-
SEME640400110	R0.1	4.0	6	6	10	50	3.85	-
SEME640400112	R0.1	4.0	6	6	12	50	3.85	-
SEME640400114	R0.1	4.0	6	6	14	60	3.85	-
SEME640400116	R0.1	4.0	6	6	16	60	3.85	-
SEME640400120	R0.1	4.0	6	6	20	60	3.85	-
SEME640400126	R0.1	4.0	6	6	26	65	3.85	-
SEME640400130	R0.1	4.0	6	6	30	70	3.85	-
SEME640400135	R0.1	4.0	6	6	35	70	3.85	-
SEME640400140	R0.1	4.0	6	6	40	80	3.85	-
SEME640400145	R0.1	4.0	6	6	45	90	3.85	-
SEME640400150	R0.1	4.0	6	6	50	100	3.85	-
SEME640400210	R0.2	4.0	6	6	10	50	3.85	-

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

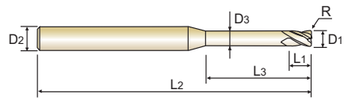
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C397

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640400212	R0.2	4.0	6	6	12	50	3.85	-
SEME640400214	R0.2	4.0	6	6	14	60	3.85	-
SEME640400216	R0.2	4.0	6	6	16	60	3.85	-
SEME640400220	R0.2	4.0	6	6	20	60	3.85	-
SEME640400226	R0.2	4.0	6	6	26	65	3.85	-
SEME640400230	R0.2	4.0	6	6	30	70	3.85	-
SEME640400235	R0.2	4.0	6	6	35	70	3.85	-
SEME640400240	R0.2	4.0	6	6	40	80	3.85	-
SEME640400245	R0.2	4.0	6	6	45	90	3.85	-
SEME640400250	R0.2	4.0	6	6	50	100	3.85	-
SEME640400310	R0.3	4.0	6	6	10	50	3.85	-
SEME640400312	R0.3	4.0	6	6	12	50	3.85	-
SEME640400314	R0.3	4.0	6	6	14	60	3.85	-
SEME640400316	R0.3	4.0	6	6	16	60	3.85	-
SEME640400320	R0.3	4.0	6	6	20	60	3.85	-
SEME640400326	R0.3	4.0	6	6	26	65	3.85	-
SEME640400330	R0.3	4.0	6	6	30	70	3.85	-
SEME640400335	R0.3	4.0	6	6	35	70	3.85	-
SEME640400340	R0.3	4.0	6	6	40	80	3.85	-
SEME640400345	R0.3	4.0	6	6	45	90	3.85	-
SEME640400350	R0.3	4.0	6	6	50	100	3.85	-
SEME640400510	R0.5	4.0	6	6	10	50	3.85	-
SEME640400512	R0.5	4.0	6	6	12	50	3.85	-
SEME640400514	R0.5	4.0	6	6	14	60	3.85	-
SEME640400516	R0.5	4.0	6	6	16	60	3.85	-
SEME640400520	R0.5	4.0	6	6	20	60	3.85	-
SEME640400526	R0.5	4.0	6	6	26	65	3.85	-
SEME640400530	R0.5	4.0	6	6	30	70	3.85	-

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

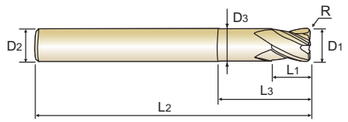
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C397

D1<Ø3.0, 30° Helix

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME640400535	R0.5	**4.0**	6	6	35	70	3.85	-
SEME640400540	R0.5	**4.0**	6	6	40	80	3.85	-
SEME640400545	R0.5	**4.0**	6	6	45	90	3.85	-
SEME640400550	R0.5	**4.0**	6	6	50	100	3.85	-
SEME640401010	R1.0	**4.0**	6	6	10	50	3.85	-
SEME640401012	R1.0	**4.0**	6	6	12	50	3.85	-
SEME640401014	R1.0	**4.0**	6	6	14	60	3.85	-
SEME640401016	R1.0	**4.0**	6	6	16	60	3.85	-
SEME640401020	R1.0	**4.0**	6	6	20	60	3.85	-
SEME640401026	R1.0	**4.0**	6	6	26	65	3.85	-
SEME640401030	R1.0	**4.0**	6	6	30	70	3.85	-
SEME640401035	R1.0	**4.0**	6	6	35	70	3.85	-
SEME640401040	R1.0	**4.0**	6	6	40	80	3.85	-
SEME640401045	R1.0	**4.0**	6	6	45	90	3.85	-
SEME640401050	R1.0	**4.0**	6	6	50	100	3.85	-
SEME6405001	R0.1	**5.0**	6	8	15	60	4.85	-
SEME6405002	R0.2	**5.0**	6	8	15	60	4.85	-
SEME6405003	R0.3	**5.0**	6	8	15	60	4.85	-
SEME6405005	R0.5	**5.0**	6	8	15	60	4.85	-
SEME6405010	R1.0	**5.0**	6	8	15	60	4.85	-
SEME6405015	R1.5	**5.0**	6	8	15	60	4.85	-
SEME6405020	R2.0	**5.0**	6	8	15	60	4.85	-
SEME6406001	R0.1	**6.0**	6	9	20	60	5.85	Regular
SEME6406002	R0.2	**6.0**	6	9	20	60	5.85	Regular
SEME6406003	R0.3	**6.0**	6	9	20	60	5.85	Regular
SEME6406005	R0.5	**6.0**	6	9	20	60	5.85	Regular
SEME6406010	R1.0	**6.0**	6	9	20	60	5.85	Regular
SEME6406015	R1.5	**6.0**	6	9	20	60	5.85	Regular

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																				◎	○

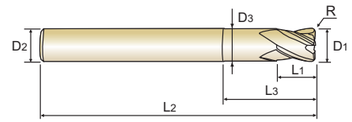
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating | p.C397

D1<Ø3.0, 30° Helix

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6406020	R2.0	**6.0**	6	9	20	60	5.85	Regular
SEME6406003090	R0.3	**6.0**	6	15	30	90	5.85	Long Shank
SEME6406005090	R0.5	**6.0**	6	15	30	90	5.85	Long Shank
SEME6406010090	R1.0	**6.0**	6	15	30	90	5.85	Long Shank
SEME6408001	R0.1	**8.0**	8	12	25	70	7.70	Regular
SEME6408002	R0.2	**8.0**	8	12	25	70	7.70	Regular
SEME6408003	R0.3	**8.0**	8	12	25	70	7.70	Regular
SEME6408005	R0.5	**8.0**	8	12	25	70	7.70	Regular
SEME6408010	R1.0	**8.0**	8	12	25	70	7.70	Regular
SEME6408015	R1.5	**8.0**	8	12	25	70	7.70	Regular
SEME6408020	R2.0	**8.0**	8	12	25	70	7.70	Regular
SEME6408003100	R0.3	**8.0**	8	20	35	100	7.70	Long Shank
SEME6408005100	R0.5	**8.0**	8	20	35	100	7.70	Long Shank
SEME6408010100	R1.0	**8.0**	8	20	35	100	8.70	Long Shank
SEME6410001	R0.1	**10.0**	10	15	30	75	9.70	Regular
SEME6410002	R0.2	**10.0**	10	15	30	75	9.70	Regular
SEME6410003	R0.3	**10.0**	10	15	30	75	9.70	Regular
SEME6410005	R0.5	**10.0**	10	15	30	75	9.70	Regular
SEME6410010	R1.0	**10.0**	10	15	30	75	9.70	Regular
SEME6410015	R1.5	**10.0**	10	15	30	75	9.70	Regular
SEME6410020	R2.0	**10.0**	10	15	30	75	9.70	Regular
SEME6410003100	R0.3	**10.0**	10	25	40	100	9.70	Long Shank
SEME6410005100	R0.5	**10.0**	10	25	40	100	9.70	Long Shank
SEME6410010100	R1.0	**10.0**	10	25	40	100	9.70	Long Shank
SEME6412002	R0.2	**12.0**	12	18	32	80	11.70	Regular
SEME6412003	R0.3	**12.0**	12	18	32	80	11.70	Regular
SEME6412005	R0.5	**12.0**	12	18	32	80	11.70	Regular
SEME6412010	R1.0	**12.0**	12	18	32	80	11.70	Regular

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

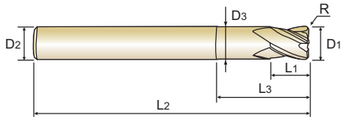
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME64** SERIES

CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | R ±0.02 | PLAIN | Y Coating

D1<Ø3.0, 30˚ Helix

p.C397

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	Remark
SEME6412015	R1.5	12.0	12	18	32	80	11.70	Regular
SEME6412020	R2.0	12.0	12	18	32	80	11.70	Regular
SEME6412003110	R0.3	12.0	12	30	50	110	11.70	Long Shank
SEME6412005110	R0.5	12.0	12	30	50	110	11.70	Long Shank
SEME6412010110	R1.0	12.0	12	30	50	110	11.70	Long Shank
SEME6416005	R0.5	16.0	16	20	35	100	15.70	Regular
SEME6416010	R1.0	16.0	16	20	35	100	15.70	Regular
SEME6416005150	R0.5	16.0	20	35	50	150	15.70	Long Shank
SEME6416010150	R1.0	16.0	20	35	50	150	15.70	Long Shank
SEME641600515020	R0.5	16.0	20	35	50	150	15.70	Long Shank
SEME641601015020	R1.0	16.0	20	35	50	150	15.70	Long Shank
SEME6420005	R0.5	20.0	20	25	40	100	19.70	Regular
SEME6420010	R1.0	20.0	20	25	40	100	19.70	Regular
SEME6420005150	R0.5	20.0	20	40	55	150	19.70	Long Shank
SEME6420010150	R1.0	20.0	20	40	55	150	19.70	Long Shank

Mill Dia. Tolerance (mm)	Corner Radius Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	±0.02	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	◎	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

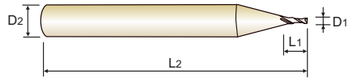
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to sharp edge geometry at end tooth, cutting ability at working is increased.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C402

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35001	0.1	4	0.2	40
SEME350015	0.15	4	0.3	40
SEME35002	0.2	4	0.4	40
SEME350025	0.25	4	0.5	40
SEME35003	0.3	4	0.6	40
SEME350035	0.35	4	0.7	40
SEME35004	0.4	4	0.8	40
SEME350045	0.45	4	0.9	40
SEME35005	0.5	4	1.0	40
SEME350055	0.55	4	1.1	40
SEME35006	0.6	4	1.2	40
SEME350065	0.65	4	1.3	40
SEME35007	0.7	4	1.4	40
SEME350075	0.75	4	1.5	40
SEME35008	0.8	4	1.6	40
SEME350085	0.85	4	1.7	40
SEME35009	0.9	4	1.8	40
SEME350095	0.95	4	2	40
SEME35010	1.0	6	2.5	50
SEME35012	1.2	6	3	50

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

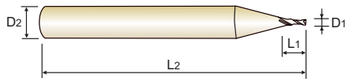
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C402

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35015	1.5	6	4	50
SEME35020	2.0	6	6	50
SEME35025	2.5	6	7	50
SEME35030	3.0	6	8	50
SEME35035	3.5	6	10	50
SEME35040	4.0	6	10	50
SEME35045	4.5	6	14	50
SEME35050	5.0	6	15	60
SEME35055	5.5	6	15	60
SEME35060	6.0	6	15	60
SEME35065	6.5	8	18	60
SEME35070	7.0	8	20	60
SEME35075	7.5	8	20	60
SEME35080	8.0	8	20	70
SEME35085	8.5	10	22	70
SEME35090	9.0	10	22	70
SEME35095	9.5	10	24	70
SEME35100	10.0	10	25	75
SEME35105	10.5	12	26	75
SEME35110	11.0	12	30	75
SEME35115	11.5	12	30	80
SEME35120	12.0	12	30	80
SEME35130	13.0	12	35	100
SEME3514012S	14.0	12	35	100
SEME3514014S	14.0	14	35	100
SEME35140	14.0	16	35	100
SEME35150	15.0	16	38	100

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

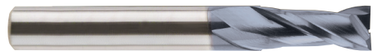
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

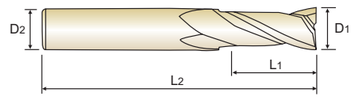
4G MILL END MILLS

PLAIN SHANK SEME35 SERIES

CARBIDE, 2 FLUTE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.





CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C402

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME35160	16.0	16	40	100
SEME35170	17.0	16	42	100
SEME35180	18.0	16	45	100
SEME3518018S	18.0	18	45	100
SEME35190	19.0	20	45	100
SEME35200	20.0	20	45	100
SEME35210	21.0	20	45	100
SEME35220	22.0	20	45	100
SEME35230	23.0	25	50	120
SEME35240	24.0	25	50	120
SEME35250	25.0	25	50	120

▶ NEXT PAGE

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0~-0.012	h5
over Ø6	0~-0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

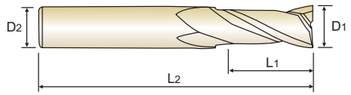
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE (0.1mm a Unit / 4mm Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C402

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME350104S	1.0	4	2.5	50
SEME350114S	1.1	4	3	50
SEME350124S	1.2	4	3	50
SEME350134S	1.3	4	3	50
SEME350144S	1.4	4	4	50
SEME350154S	1.5	4	4	50
SEME350164S	1.6	4	4	50
SEME350174S	1.7	4	4	50
SEME350184S	1.8	4	5	50
SEME350194S	1.9	4	5	50
SEME350204S	2.0	4	6	50
SEME350214S	2.1	4	6	50
SEME350224S	2.2	4	6	50
SEME350234S	2.3	4	6	50
SEME350244S	2.4	4	6	50
SEME350254S	2.5	4	8	50
SEME350264S	2.6	4	8	50
SEME350274S	2.7	4	8	50
SEME350284S	2.8	4	8	50
SEME350294S	2.9	4	8	50
SEME350304S	3.0	4	8	50
SEME350354S	3.5	4	10	50
SEME350404S	4.0	4	10	50
SEME350404S080	4.0	4	10	80

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

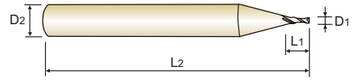
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME35** SERIES

CARBIDE, 2 FLUTE (3mm Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C402

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME350013S	0.1	3	0.2	40
SEME350023S	0.2	3	0.4	40
SEME350033S	0.3	3	0.6	40
SEME350043S	0.4	3	0.8	40
SEME350053S	0.5	3	1.0	40
SEME350063S	0.6	3	1.2	40
SEME350073S	0.7	3	1.4	40
SEME350083S	0.8	3	1.6	40
SEME350093S	0.9	3	1.8	40
SEME350103S	1.0	3	2.5	50
SEME350123S	1.2	3	3	50
SEME350153S	1.5	3	4	50
SEME350203S	2.0	3	6	50
SEME350253S	2.5	3	7	50
SEME350303S	3.0	3	8	50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.012	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

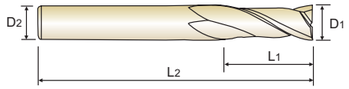
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C406

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7001003	1.0	6	3	60
SEME7001004	1.0	6	4	60
SEME7001005	1.0	6	5	60
SEME7001006	1.0	6	6	60
SEME7001007	1.0	6	7	60
SEME7001008	1.0	6	8	60
SEME7001010	1.0	6	10	60
SEME7001012	1.0	6	12	60
SEME7001204	1.2	6	4	60
SEME7001206	1.2	6	6	60
SEME7001208	1.2	6	8	60
SEME7001210	1.2	6	10	60
SEME7001212	1.2	6	12	60
SEME7001506	1.5	6	6	60
SEME7001508	1.5	6	8	60
SEME7001510	1.5	6	10	60
SEME7001512	1.5	6	12	60
SEME7001514	1.5	6	14	60
SEME7001516	1.5	6	16	60
SEME7002008	2.0	6	8	60
SEME7002010	2.0	6	10	60
SEME7002012	2.0	6	12	60
SEME7002014	2.0	6	14	60
SEME7002016	2.0	6	16	60
SEME7002510	2.5	6	10	60
SEME7002512	2.5	6	12	60
SEME7002516	2.5	6	16	60
SEME7002520	2.5	6	20	60

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

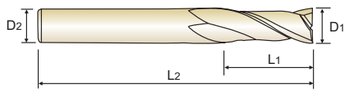
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK SEME70 SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C406

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7002526	2.5	6	26	60
SEME70030163S	3.0	3	16	100
SEME7003010	3.0	6	10	70
SEME7003012	3.0	6	12	70
SEME7003014	3.0	6	14	70
SEME7003016	3.0	6	16	70
SEME7003020	3.0	6	20	70
SEME7003026	3.0	6	26	70
SEME7003030	3.0	6	30	70
SEME70040204S	4.0	4	20	100
SEME7004012	4.0	6	12	70
SEME7004016	4.0	6	16	70
SEME7004020	4.0	6	20	70
SEME7004026	4.0	6	26	70
SEME7004030	4.0	6	30	70
SEME7005020	5.0	6	20	70
SEME7005025	5.0	6	25	70
SEME7005025100	5.0	6	25	100
SEME7005030	5.0	6	30	80
SEME7005035	5.0	6	35	90
SEME7005040	5.0	6	40	100
SEME7006015	6.0	6	15	60
SEME7006015080	6.0	6	15	80
SEME7006020	6.0	6	20	70
SEME7006020090	6.0	6	20	90
SEME7006025	6.0	6	25	75
SEME7006030	6.0	6	30	80
SEME7006030100	6.0	6	30	100

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

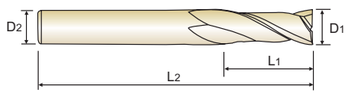
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C406

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7006030150	6.0	6	30	150
SEME7006035	6.0	6	35	90
SEME7006040	6.0	6	40	90
SEME7006040120	6.0	6	40	120
SEME7006045	6.0	6	45	150
SEME7008025	8.0	8	25	80
SEME7008030	8.0	8	30	80
SEME7008030100	8.0	8	30	100
SEME7008035	8.0	8	35	90
SEME7008040	8.0	8	40	90
SEME7008040120	8.0	8	40	120
SEME7008040150	8.0	8	40	150
SEME7008045	8.0	8	45	100
SEME7008050	8.0	8	50	100
SEME7008050150	8.0	8	50	150
SEME7010030	10.0	10	30	80
SEME7010030100	10.0	10	30	100
SEME7010035	10.0	10	35	90
SEME7010040	10.0	10	40	90
SEME7010040120	10.0	10	40	120
SEME7010045	10.0	10	45	100
SEME7010050	10.0	10	50	100
SEME7010050150	10.0	10	50	150
SEME7010050200	10.0	10	50	200
SEME7010055	10.0	10	55	150
SEME7010060	10.0	10	60	110
SEME7010060200	10.0	10	60	200
SEME7012035	12.0	12	35	90

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

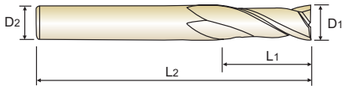
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C406

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7012040	12.0	12	40	100
SEME7012040120	12.0	12	40	120
SEME7012045	12.0	12	45	130
SEME7012050	12.0	12	50	100
SEME7012050150	12.0	12	50	150
SEME7012055	12.0	12	55	110
SEME7012060	12.0	12	60	110
SEME7012060150	12.0	12	60	150
SEME7012060200	12.0	12	60	200
SEME7012065	12.0	12	65	150
SEME7012070	12.0	12	70	120
SEME7012070200	12.0	12	70	200
SEME7014050	14.0	16	50	110
SEME7014060	14.0	16	60	150
SEME7016040	16.0	16	40	150
SEME7016050	16.0	16	50	110
SEME7016050150	16.0	16	50	150
SEME7016060	16.0	16	60	120
SEME7016070	16.0	16	70	130
SEME7016070150	16.0	16	70	150
SEME7016070200	16.0	16	70	200
SEME7016080	16.0	16	80	150
SEME7016090	16.0	16	90	150
SEME70160110	16.0	16	110	200
SEME70160120	16.0	16	120	250
SEME7018050	18.0	20	50	120
SEME7018070	18.0	20	70	130
SEME70180100	18.0	20	100	200

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○	

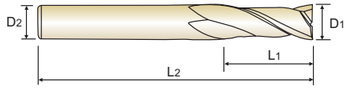
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME70** SERIES

CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C406

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7020050	20.0	20	50	110
SEME7020050150	20.0	20	50	150
SEME7020060	20.0	20	60	130
SEME7020070	20.0	20	70	130
SEME7020080	20.0	20	80	150
SEME7020090	20.0	20	90	150
SEME7020090200	20.0	20	90	200
SEME70200110	20.0	20	110	200
SEME70200120	20.0	20	120	250
SEME7022075	22.0	20	75	150
SEME70220110	22.0	20	110	200
SEME7025070	25.0	25	70	150
SEME7025090	25.0	25	90	150
SEME70250110	25.0	25	110	200
SEME70250120	25.0	25	120	250

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

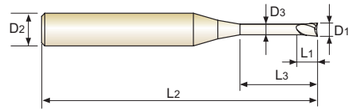
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- Available various rib processing due to supplying various effective length and overall length products.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM845001003	0.1	4	0.15	0.3	40	0.085
SEM845001005	0.1	4	0.15	0.5	40	0.085
SEM84500101	0.1	4	0.15	1	40	0.085
SEM845002005	0.2	4	0.3	0.5	40	0.17
SEM84500201	0.2	4	0.3	1	40	0.17
SEM845002015	0.2	4	0.3	1.5	40	0.17
SEM84500202	0.2	4	0.3	2	40	0.17
SEM84500301	0.3	4	0.5	1	40	0.27
SEM845003015	0.3	4	0.5	1.5	40	0.27
SEM84500302	0.3	4	0.5	2	40	0.27
SEM845003025	0.3	4	0.5	2.5	40	0.27
SEM84500303	0.3	4	0.5	3	40	0.27
SEM84500304	0.3	4	0.5	4	40	0.27
SEM84500305	0.3	4	0.5	5	40	0.27
SEM84500401	0.4	4	0.6	1	40	0.37
SEM845004015	0.4	4	0.6	1.5	40	0.37
SEM84500402	0.4	4	0.6	2	40	0.37
SEM845004025	0.4	4	0.6	2.5	40	0.37
SEM84500403	0.4	4	0.6	3	40	0.37
SEM84500404	0.4	4	0.6	4	40	0.37
SEM84500405	0.4	4	0.6	5	40	0.37
SEM84500406	0.4	4	0.6	6	40	0.37
SEM84500408	0.4	4	0.6	8	40	0.37
SEM84500410	0.4	4	0.6	10	40	0.37
SEM84500501	0.5	4	0.7	1	45	0.45
SEM845005015	0.5	4	0.7	1.5	45	0.45
SEM84500502	0.5	4	0.7	2	45	0.45
SEM845005025	0.5	4	0.7	2.5	45	0.45

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

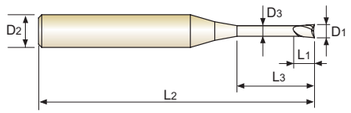
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- Available various rib processing due to supplying various effective length and overall length products.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84500503	0.5	4	0.7	3	45	0.45
SEM84500504	0.5	4	0.7	4	45	0.45
SEM84500505	0.5	4	0.7	5	45	0.45
SEM84500506	0.5	4	0.7	6	45	0.45
SEM84500508	0.5	4	0.7	8	45	0.45
SEM84500510	0.5	4	0.7	10	45	0.45
SEM84500512	0.5	4	0.7	12	45	0.45
SEM84500514	0.5	4	0.7	14	45	0.45
SEM84500516	0.5	4	0.7	16	45	0.45
SEM84500602	0.6	4	0.9	2	45	0.55
SEM84500603	0.6	4	0.9	3	45	0.55
SEM84500604	0.6	4	0.9	4	45	0.55
SEM84500605	0.6	4	0.9	5	45	0.55
SEM84500606	0.6	4	0.9	6	45	0.55
SEM84500608	0.6	4	0.9	8	45	0.55
SEM84500610	0.6	4	0.9	10	45	0.55
SEM84500612	0.6	4	0.9	12	45	0.55
SEM84500614	0.6	4	0.9	14	45	0.55
SEM84500616	0.6	4	0.9	16	45	0.55
SEM84500702	0.7	4	1.2	2	45	0.65
SEM84500704	0.7	4	1.2	4	45	0.65
SEM84500706	0.7	4	1.2	6	45	0.65
SEM84500708	0.7	4	1.2	8	45	0.65
SEM84500710	0.7	4	1.2	10	45	0.65
SEM84500712	0.7	4	1.2	12	45	0.65
SEM84500802	0.8	4	1.2	2	45	0.75
SEM84500803	0.8	4	1.2	3	45	0.75
SEM84500804	0.8	4	1.2	4	45	0.75

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

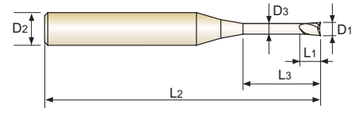
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- Available various rib processing due to supplying various effective length and overall length products.



CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84500805	0.8	4	1.2	5	45	0.75
SEM84500806	0.8	4	1.2	6	45	0.75
SEM84500808	0.8	4	1.2	8	45	0.75
SEM84500810	0.8	4	1.2	10	45	0.75
SEM84500812	0.8	4	1.2	12	45	0.75
SEM84500814	0.8	4	1.2	14	45	0.75
SEM84500816	0.8	4	1.2	16	45	0.75
SEM84500820	0.8	4	1.2	20	45	0.75
SEM84500906	0.9	4	1.3	6	45	0.85
SEM84500908	0.9	4	1.3	8	45	0.85
SEM84500910	0.9	4	1.3	10	45	0.85
SEM84501002	1.0	4	1.5	2	50	0.95
SEM84501003	1.0	4	1.5	3	50	0.95
SEM84501004	1.0	4	1.5	4	50	0.95
SEM84501005	1.0	4	1.5	5	50	0.95
SEM84501006	1.0	4	1.5	6	50	0.95
SEM84501007	1.0	4	1.5	7	50	0.95
SEM84501008	1.0	4	1.5	8	50	0.95
SEM84501010	1.0	4	1.5	10	50	0.95
SEM84501012	1.0	4	1.5	12	50	0.95
SEM84501014	1.0	4	1.5	14	50	0.95
SEM84501016	1.0	4	1.5	16	50	0.95
SEM84501018	1.0	4	1.5	18	50	0.95
SEM84501020	1.0	4	1.5	20	50	0.95
SEM84501022	1.0	4	1.5	22	60	0.95
SEM84501026	1.0	4	1.5	26	60	0.95
SEM84501030	1.0	4	1.5	30	70	0.95
SEM84501040	1.0	4	1.5	40	80	0.95

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

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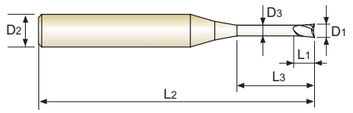

CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84501050	1.0	4	1.5	50	100	0.95
SEM84501204	1.2	4	1.8	4	50	1.15
SEM84501206	1.2	4	1.8	6	50	1.15
SEM84501208	1.2	4	1.8	8	50	1.15
SEM84501210	1.2	4	1.8	10	50	1.15
SEM84501212	1.2	4	1.8	12	50	1.15
SEM84501214	1.2	4	1.8	14	50	1.15
SEM84501216	1.2	4	1.8	16	50	1.15
SEM84501220	1.2	4	1.8	20	50	1.15
SEM84501226	1.2	4	1.8	26	60	1.15
SEM84501230	1.2	4	1.8	30	70	1.15
SEM84501406	1.4	4	2.1	6	50	1.35
SEM84501408	1.4	4	2.1	8	50	1.35
SEM84501410	1.4	4	2.1	10	50	1.35
SEM84501414	1.4	4	2.1	14	50	1.35
SEM84501416	1.4	4	2.1	16	50	1.35
SEM84501420	1.4	4	2.1	20	50	1.35
SEM84501504	1.5	4	2.3	4	50	1.45
SEM84501505	1.5	4	2.3	5	50	1. 45
SEM84501506	1.5	4	2.3	6	50	1.45
SEM84501507	1.5	4	2.3	7	50	1.45
SEM84501508	1.5	4	2.3	8	50	1.45
SEM84501510	1.5	4	2.3	10	50	1.45
SEM84501512	1.5	4	2.3	12	50	1.45
SEM84501514	1.5	4	2.3	14	50	1.45
SEM84501516	1.5	4	2.3	16	50	1.45
SEM84501518	1.5	4	2.3	18	50	1.45
SEM84501520	1.5	4	2.3	20	50	1.45

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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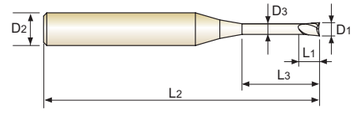

CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84501522	1.5	4	2.3	22	60	1.45
SEM84501526	1.5	4	2.3	26	60	1.45
SEM84501530	1.5	4	2.3	30	70	1.45
SEM84501608	1.6	4	2.3	8	50	1.55
SEM84501610	1.6	4	2.3	10	50	1.55
SEM84501612	1.6	4	2.3	12	50	1.55
SEM84501616	1.6	4	2.3	16	50	1.55
SEM84501620	1.6	4	2.3	20	50	1.55
SEM84501808	1.8	4	2.7	8	50	1.75
SEM84501810	1.8	4	2.7	10	50	1.75
SEM84501812	1.8	4	2.7	12	50	1.75
SEM84501816	1.8	4	2.7	16	50	1.75
SEM84501820	1.8	4	2.7	20	50	1.75
SEM84502006	2.0	4	3	6	50	1.95
SEM84502008	2.0	4	3	8	50	1.95
SEM84502010	2.0	4	3	10	50	1.95
SEM84502012	2.0	4	3	12	50	1.95
SEM84502014	2.0	4	3	14	50	1.95
SEM84502016	2.0	4	3	16	50	1.95
SEM84502018	2.0	4	3	18	50	1.95
SEM84502020	2.0	4	3	20	50	1.95
SEM84502022	2.0	4	3	22	60	1.95
SEM84502026	2.0	4	3	26	60	1.95
SEM84502030	2.0	4	3	30	70	1.95
SEM84502035	2.0	4	3	35	70	1.95
SEM84502040	2.0	4	3	40	80	1.95
SEM84502045	2.0	4	3	45	90	1.95
SEM84502050	2.0	4	3	50	100	1.95

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

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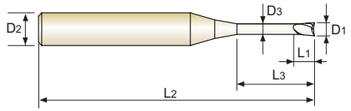

CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84502060	2.0	4	3	60	110	1.95
SEM84502508	2.5	4	4	8	50	2.40
SEM84502510	2.5	4	4	10	50	2.40
SEM84502512	2.5	4	4	12	50	2.40
SEM84502514	2.5	4	4	14	50	2.40
SEM84502516	2.5	4	4	16	50	2.40
SEM84502518	2.5	4	4	18	50	2.40
SEM84502520	2.5	4	4	20	50	2.40
SEM84502522	2.5	4	4	22	60	2.40
SEM84502526	2.5	4	4	26	60	2.40
SEM84502530	2.5	4	4	30	70	2.40
SEM84502535	2.5	4	4	35	70	2.40
SEM84502540	2.5	4	4	40	80	2.40
SEM84502545	2.5	4	4	45	90	2.40
SEM84502550	2.5	4	4	50	100	2.40
SEM84503006	3.0	6	4.5	6	50	2.85
SEM84503008	3.0	6	4.5	8	50	2.85
SEM84503010	3.0	6	4.5	10	50	2.85
SEM84503012	3.0	6	4.5	12	50	2.85
SEM84503014	3.0	6	4.5	14	60	2.85
SEM84503016	3.0	6	4.5	16	60	2.85
SEM84503018	3.0	6	4.5	18	60	2.85
SEM84503020	3.0	6	4.5	20	60	2.85
SEM84503022	3.0	6	4.5	22	65	2.85
SEM84503026	3.0	6	4.5	26	65	2.85
SEM84503030	3.0	6	4.5	30	70	2.85
SEM84503035	3.0	6	4.5	35	70	2.85
SEM84503040	3.0	6	4.5	40	80	2.85

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

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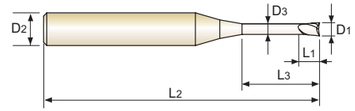


CARBIDE | 2 | 30° | PLAIN | Y Coating | p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84503045	3.0	6	4.5	45	90	2.85
SEM84503050	3.0	6	4.5	50	100	2.85
SEM84503060	3.0	6	4.5	60	100	2.85
SEM84504008	4.0	6	6	8	50	3.85
SEM84504010	4.0	6	6	10	50	3.85
SEM84504012	4.0	6	6	12	50	3.85
SEM84504014	4.0	6	6	14	60	3.85
SEM84504016	4.0	6	6	16	60	3.85
SEM84504018	4.0	6	6	18	60	3.85
SEM84504020	4.0	6	6	20	60	3.85
SEM84504022	4.0	6	6	22	65	3.85
SEM84504026	4.0	6	6	26	65	3.85
SEM84504030	4.0	6	6	30	70	3.85
SEM84504035	4.0	6	6	35	70	3.85
SEM84504040	4.0	6	6	40	80	3.85
SEM84504045	4.0	6	6	45	90	3.85
SEM84504050	4.0	6	6	50	100	3.85
SEM84504060	4.0	6	6	60	100	3.85
SEM84505016	5.0	6	8	16	60	4.85
SEM84505020	5.0	6	8	20	60	4.85
SEM84505026	5.0	6	8	26	65	4.85
SEM84505030	5.0	6	8	30	70	4.85
SEM84505035	5.0	6	8	35	75	4.85
SEM84505040	5.0	6	8	40	80	4.85
SEM84505050	5.0	6	8	50	90	4.85
SEM84505060	5.0	6	8	60	100	4.85
SEM84506015	6.0	6	9	15	60	5.85
SEM84506020	6.0	6	9	20	60	5.85

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

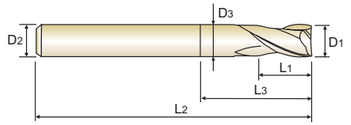
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEM845** SERIES

CARBIDE, 2 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- Available various rib processing due to supplying various effective length and overall length products.



CARBIDE | 2 | 30° | PLAIN | Y Coating

p.C413

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEM84506030	6.0	6	9	30	70	5.85
SEM84506032	6.0	6	9	32	90	5.85
SEM84508025	8.0	8	12	25	70	7.70
SEM84508030	8.0	8	12	30	80	7.70
SEM84508042	8.0	8	12	42	100	7.70
SEM84510030	10.0	10	15	30	75	9.70
SEM84510035	10.0	10	15	35	80	9.70
SEM84510045	10.0	10	15	45	100	9.70
SEM84512035	12.0	12	20	35	80	11.70
SEM84512040	12.0	12	20	40	90	11.70
SEM84512050	12.0	12	20	50	110	11.70

Size	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø6	0~-0.012	h5
over Ø6	0~-0.015	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

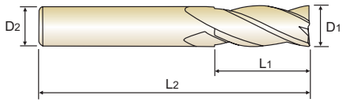
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME36** SERIES

CARBIDE, 4 FLUTE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | PLAIN | Y Coating

p.C425

◇ Call for Availability

D1<Ø3.0, 30° Helix

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME36008	0.8	4	1.6	40
SEME36009	0.9	4	1.8	40
SEME36010	1.0	6	2.5	50
SEME36012	1.2	6	3	50
SEME36015	1.5	6	4	50
SEME36020	2.0	6	6	50
SEME36025	2.5	6	7	50
SEME36030	3.0	6	8	50
SEME36035	3.5	6	10	50
SEME36040	4.0	6	10	50
SEME36045	4.5	6	14	50
SEME36050	5.0	6	15	60
SEME36055	5.5	6	15	60
SEME36060	6.0	6	15	60
SEME36065	6.5	8	18	60
SEME36070	7.0	8	20	60
SEME36075	7.5	8	20	60
SEME36080	8.0	8	20	70
SEME36085	8.5	10	22	70
SEME36090	9.0	10	22	70
SEME36095	9.5	10	24	70
SEME36100	10.0	10	25	75
SEME36105	10.5	12	26	75
SEME36110	11.0	12	30	75

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

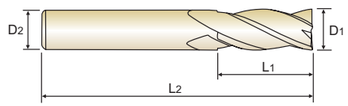
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME36** SERIES

CARBIDE, 4 FLUTE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.



CARBIDE | 4 | 27°/30° | PLAIN | Y Coating | p.C425

D1<Ø3.0, 30° Helix

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME36115	11.5	12	30	80
SEME36120	12.0	12	30	80
SEME36130	13.0	12	35	100
SEME3614012S	14.0	12	35	100
SEME3614014S	14.0	14	35	100
SEME36140	14.0	16	35	100
SEME36150	15.0	16	38	100
SEME36160	16.0	16	40	100
SEME36170	17.0	16	42	100
SEME36180	18.0	16	45	100
SEME3618018S	18.0	18	45	100
SEME36190	19.0	20	45	100
SEME36200	20.0	20	45	100
SEME36210	21.0	20	45	100
SEME36220	22.0	20	45	100
SEME36230	23.0	25	50	120
SEME36240	24.0	25	50	120
SEME36250	25.0	25	50	120

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

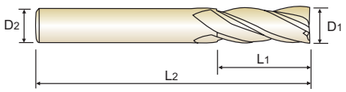
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
  - Designed equal index flute for long length end mills.
- ▶Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- ▶Available various length products like short, regular and long length end mills etc.



CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.C425

D1<Ø3.0, Long Length 38° Helix

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME7101001	1.0	6	1	40	Short
SEME7101002	1.0	6	2	40	Short
SEME71010	1.0	6	2.5	50	Regular
SEME7101003	1.0	6	3	50	Long
SEME7101004	1.0	6	4	50	Long
SEME7101006	1.0	6	6	50	Long
SEME7101202	1.2	6	2	40	Short
SEME71012	1.2	6	3	50	Regular
SEME7101204	1.2	6	4	50	Long
SEME7101206	1.2	6	6	50	Long
SEME71015015	1.5	6	1.5	40	Short
SEME7101503	1.5	6	3	40	Short
SEME71015	1.5	6	4	50	Regular
SEME7101506	1.5	6	6	50	Long
SEME7101508	1.5	6	8	50	Long
SEME7101510	1.5	6	10	50	Long
SEME7102002	2.0	6	2	40	Short
SEME7102004	2.0	6	4	40	Short
SEME71020	2.0	6	6	50	Regular
SEME7102008	2.0	6	8	50	Long
SEME7102010	2.0	6	10	50	Long
SEME7102012	2.0	6	12	50	Long
SEME71025025	2.5	6	2.5	40	Short
SEME7102505	2.5	6	5	40	Short

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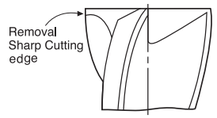


◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

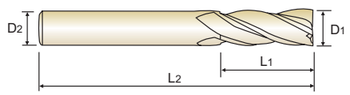
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
  - Designed equal index flute for long length end mills.
- ▶Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- ▶Available various length products like short, regular and long length end mills etc.



CARBIDE | 4 | 35°/38° | PLAIN | Y Coating

p.C425

◇ Call for Availability

D1<Ø3.0, Long Length 38° Helix

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME71025	2.5	6	7	50	Regular
SEME7102510	2.5	6	10	50	Long
SEME7102512	2.5	6	12	50	Long
SEME7103003	3.0	6	3	40	Short
SEME7103006	3.0	6	6	40	Short
SEME71030	3.0	6	8	50	Regular
SEME7103010	3.0	6	10	50	Long
SEME7103012	3.0	6	12	50	Long
SEME7103014	3.0	6	14	50	Long
SEME7104004	4.0	6	4	40	Short
SEME7104008	4.0	6	8	40	Short
SEME71040	4.0	6	10	50	Regular
SEME7104012	4.0	6	12	50	Long
SEME7104014	4.0	6	14	50	Long
SEME7104016	4.0	6	16	50	Long
SEME7105005	5.0	6	5	50	Short
SEME7105010	5.0	6	10	50	Short
SEME71050	5.0	6	15	60	Regular
SEME7105020	5.0	6	20	60	Long
SEME7105025	5.0	6	25	60	Long
SEME7106006	6.0	6	6	50	Short
SEME7106012	6.0	6	12	50	Short

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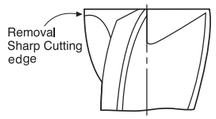


◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

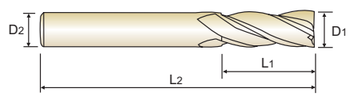
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME71** SERIES

CARBIDE, 4 FLUTE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
  - Designed equal index flute for long length end mills.
- ▶Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- ▶Available various length products like short, regular and long length end mills etc.



CARBIDE | 4 | 35°/38° | PLAIN | Y Coating

p.C425

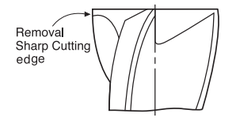
◇ Call for Availability

D1<Ø3.0, Long Length 38° Helix

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME71060	6.0	6	15	60	Regular
SEME7106020	6.0	6	20	60	Long
SEME7106025	6.0	6	25	60	Long
SEME7108016	8.0	8	16	60	Short
SEME71080	8.0	8	20	70	Regular
SEME7108025	8.0	8	25	70	Long
SEME7108030	8.0	8	30	70	Long
SEME7110022	10.0	10	22	65	Short
SEME71100	10.0	10	25	75	Regular
SEME7110030	10.0	10	30	75	Long
SEME7110035	10.0	10	35	75	Long
SEME7112026	12.0	12	26	70	Short
SEME71120	12.0	12	30	80	Regular
SEME7112035	12.0	12	35	80	Long
SEME7112040	12.0	12	40	80	Long
SEME71140	14.0	16	35	100	Regular
SEME7116032	16.0	16	32	100	Short
SEME71160	16.0	16	40	100	Regular
SEME71180	18.0	20	45	100	Regular
SEME71200	20.0	20	45	100	Regular

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

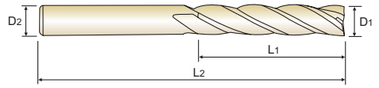
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C428

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7201003	1.0	6	3	60
SEME7201004	1.0	6	4	60
SEME7201005	1.0	6	5	60
SEME7201006	1.0	6	6	60
SEME7201007	1.0	6	7	60
SEME7201008	1.0	6	8	60
SEME7201010	1.0	6	10	60
SEME7201012	1.0	6	12	60
SEME7201204	1.2	6	4	60
SEME7201206	1.2	6	6	60
SEME7201208	1.2	6	8	60
SEME7201210	1.2	6	10	60
SEME7201212	1.2	6	12	60
SEME7201506	1.5	6	6	60
SEME7201508	1.5	6	8	60
SEME7201510	1.5	6	10	60
SEME7201512	1.5	6	12	60
SEME7201514	1.5	6	14	60
SEME7201516	1.5	6	16	60
SEME7202008	2.0	6	8	60
SEME7202010	2.0	6	10	60
SEME7202012	2.0	6	12	60
SEME7202014	2.0	6	14	60
SEME7202016	2.0	6	16	60
SEME7202510	2.5	6	10	60
SEME7202512	2.5	6	12	60
SEME7202516	2.5	6	16	60
SEME7202520	2.5	6	20	60

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

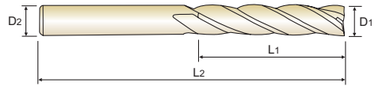
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C428

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7202526	2.5	6	26	60
SEME72030163S	3.0	3	16	100
SEME7203010	3.0	6	10	70
SEME7203012	3.0	6	12	70
SEME7203014	3.0	6	14	70
SEME7203016	3.0	6	16	70
SEME7203020	3.0	6	20	70
SEME7203026	3.0	6	26	70
SEME7203030	3.0	6	30	70
SEME72040204S	4.0	4	20	100
SEME7204012	4.0	6	12	70
SEME7204016	4.0	6	16	70
SEME7204020	4.0	6	20	70
SEME7204026	4.0	6	26	70
SEME7204030	4.0	6	30	70
SEME7205020	5.0	6	20	70
SEME7205025	5.0	6	25	70
SEME7205025100	5.0	6	25	100
SEME7205030	5.0	6	30	80
SEME7205035	5.0	6	35	90
SEME7205040	5.0	6	40	100
SEME7206015	6.0	6	15	60
SEME7206015080	6.0	6	15	80
SEME7206020	6.0	6	20	70
SEME7206020090	6.0	6	20	90
SEME7206025	6.0	6	25	75
SEME7206030	6.0	6	30	80
SEME7206030100	6.0	6	30	100

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

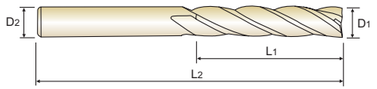
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C428

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7206030150	6.0	6	30	150
SEME7206035	6.0	6	35	90
SEME7206040	6.0	6	40	90
SEME7206040120	6.0	6	40	120
SEME7206045	6.0	6	45	150
SEME7208025	8.0	8	25	80
SEME7208030	8.0	8	30	80
SEME7208030100	8.0	8	30	100
SEME7208035	8.0	8	35	90
SEME7208040	8.0	8	40	90
SEME7208040120	8.0	8	40	120
SEME7208040150	8.0	8	40	150
SEME7208045	8.0	8	45	100
SEME7208050	8.0	8	50	100
SEME7208050150	8.0	8	50	150
SEME7210030	10.0	10	30	80
SEME7210030100	10.0	10	30	100
SEME7210035	10.0	10	35	90
SEME7210040	10.0	10	40	90
SEME7210040120	10.0	10	40	120
SEME7210045	10.0	10	45	100
SEME7210050	10.0	10	50	100
SEME7210050150	10.0	10	50	150
SEME7210050200	10.0	10	50	200
SEME7210055	10.0	10	55	150
SEME7210060	10.0	10	60	110
SEME7210060200	10.0	10	60	200
SEME7212035	12.0	12	35	90

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◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

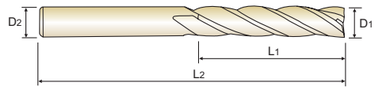
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME72** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C428

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7212040	12.0	12	40	100
SEME7212040120	12.0	12	40	120
SEME7212045	12.0	12	45	130
SEME7212050	12.0	12	50	100
SEME7212050150	12.0	12	50	150
SEME7212055	12.0	12	55	110
SEME7212060	12.0	12	60	110
SEME7212060150	12.0	12	60	150
SEME7212060200	12.0	12	60	200
SEME7212065	12.0	12	65	150
SEME7212070	12.0	12	70	120
SEME7212070200	12.0	12	70	200
SEME7214050	14.0	16	50	110
SEME7214060	14.0	16	60	150
SEME7216040	16.0	16	40	150
SEME7216050	16.0	16	50	110
SEME7216050150	16.0	16	50	150
SEME7216060	16.0	16	60	120
SEME7216070	16.0	16	70	130
SEME7216070150	16.0	16	70	150
SEME7216070200	16.0	16	70	200
SEME7216080	16.0	16	80	150
SEME7216090	16.0	16	90	150
SEME72160110	16.0	16	110	200
SEME72160120	16.0	16	120	250
SEME7218050	18.0	20	50	120
SEME7218070	18.0	20	70	130
SEME72180100	18.0	20	100	200

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

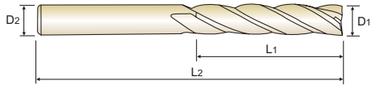
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME72 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C428

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
SEME7220050	20.0	20	50	110
SEME7220050150	20.0	20	50	150
SEME7220060	20.0	20	60	130
SEME7220070	20.0	20	70	130
SEME7220080	20.0	20	80	150
SEME7220090	20.0	20	90	150
SEME7220090200	20.0	20	90	200
SEME72200110	20.0	20	110	200
SEME72200120	20.0	20	120	250
SEME7222075	22.0	20	75	150
SEME72220110	22.0	20	110	200
SEME7225070	25.0	25	70	150
SEME7225090	25.0	25	90	150
SEME72250110	25.0	25	110	200
SEME72250120	25.0	25	120	250

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

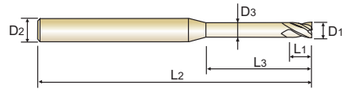
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME73 SERIES**

CARBIDE, 4 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating

p.C436

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7301002	1.0	4	1.5	2	50	0.95
SEME7301003	1.0	4	1.5	3	50	0.95
SEME7301004	1.0	4	1.5	4	50	0.95
SEME7301005	1.0	4	1.5	5	50	0.95
SEME7301006	1.0	4	1.5	6	50	0.95
SEME7301007	1.0	4	1.5	7	50	0.95
SEME7301008	1.0	4	1.5	8	50	0.95
SEME7301010	1.0	4	1.5	10	50	0.95
SEME7301012	1.0	4	1.5	12	50	0.95
SEME7301014	1.0	4	1.5	14	50	0.95
SEME7301016	1.0	4	1.5	16	50	0.95
SEME7301018	1.0	4	1.5	18	50	0.95
SEME7301020	1.0	4	1.5	20	50	0.95
SEME7301022	1.0	4	1.5	22	60	0.95
SEME7301026	1.0	4	1.5	26	60	0.95
SEME7301030	1.0	4	1.5	30	70	0.95
SEME7301040	1.0	4	1.5	40	80	0.95
SEME7301050	1.0	4	1.5	50	100	0.95
SEME7301204	1.2	4	1.8	4	50	1.15
SEME7301206	1.2	4	1.8	6	50	1.15
SEME7301208	1.2	4	1.8	8	50	1.15
SEME7301210	1.2	4	1.8	10	50	1.15
SEME7301212	1.2	4	1.8	12	50	1.15
SEME7301214	1.2	4	1.8	14	50	1.15
SEME7301216	1.2	4	1.8	16	50	1.15
SEME7301220	1.2	4	1.8	20	50	1.15

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

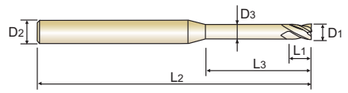
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C436

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7301226	1.2	4	1.8	26	60	1.15
SEME7301230	1.2	4	1.8	30	70	1.15
SEME7301504	1.5	4	2.3	4	50	1.45
SEME7301505	1.5	4	2.3	5	50	1.45
SEME7301506	1.5	4	2.3	6	50	1.45
SEME7301507	1.5	4	2.3	7	50	1.45
SEME7301508	1.5	4	2.3	8	50	1.45
SEME7301510	1.5	4	2.3	10	50	1.45
SEME7301512	1.5	4	2.3	12	50	1.45
SEME7301514	1.5	4	2.3	14	50	1.45
SEME7301516	1.5	4	2.3	16	50	1.45
SEME7301518	1.5	4	2.3	18	50	1.45
SEME7301520	1.5	4	2.3	20	50	1.45
SEME7301522	1.5	4	2.3	22	60	1.45
SEME7301526	1.5	4	2.3	26	60	1.45
SEME7301530	1.5	4	2.3	30	70	1.45
SEME7302006	2.0	4	3	6	50	1.95
SEME7302008	2.0	4	3	8	50	1.95
SEME7302010	2.0	4	3	10	50	1.95
SEME7302012	2.0	4	3	12	50	1.95
SEME7302014	2.0	4	3	14	50	1.95
SEME7302016	2.0	4	3	16	50	1.95
SEME7302018	2.0	4	3	18	50	1.95
SEME7302020	2.0	4	3	20	50	1.95
SEME7302022	2.0	4	3	22	60	1.95
SEME7302026	2.0	4	3	26	60	1.95

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

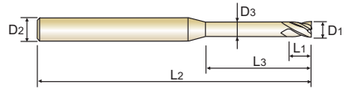
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C436

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7302030	2.0	4	3	30	70	1.95
SEME7302035	2.0	4	3	35	70	1.95
SEME7302040	2.0	4	3	40	80	1.95
SEME7302045	2.0	4	3	45	90	1.95
SEME7302050	2.0	4	3	50	100	1.95
SEME7302060	2.0	4	3	60	110	1.95
SEME7302508	2.5	4	4	8	50	2.40
SEME7302510	2.5	4	4	10	50	2.40
SEME7302512	2.5	4	4	12	50	2.40
SEME7302514	2.5	4	4	14	50	2.40
SEME7302516	2.5	4	4	16	50	2.40
SEME7302518	2.5	4	4	18	50	2.40
SEME7302520	2.5	4	4	20	50	2.40
SEME7302522	2.5	4	4	22	60	2.40
SEME7302526	2.5	4	4	26	60	2.40
SEME7302530	2.5	4	4	30	70	2.40
SEME7302535	2.5	4	4	35	70	2.40
SEME7302540	2.5	4	4	40	80	2.40
SEME7302545	2.5	4	4	45	90	2.40
SEME7302550	2.5	4	4	50	100	2.40
SEME7303006	3.0	6	4.5	6	50	2.85
SEME7303008	3.0	6	4.5	8	50	2.85
SEME7303010	3.0	6	4.5	10	50	2.85
SEME7303012	3.0	6	4.5	12	50	2.85
SEME7303014	3.0	6	4.5	14	60	2.85
SEME7303016	3.0	6	4.5	16	60	2.85

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

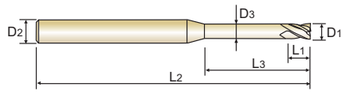
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C436

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7303018	3.0	6	4.5	18	60	2.85
SEME7303020	3.0	6	4.5	20	60	2.85
SEME7303022	3.0	6	4.5	22	65	2.85
SEME7303026	3.0	6	4.5	26	65	2.85
SEME7303030	3.0	6	4.5	30	70	2.85
SEME7303035	3.0	6	4.5	35	70	2.85
SEME7303040	3.0	6	4.5	40	80	2.85
SEME7303045	3.0	6	4.5	45	90	2.85
SEME7303050	3.0	6	4.5	50	100	2.85
SEME7303060	3.0	6	4.5	60	100	2.85
SEME7304008	4.0	6	6	8	50	3.85
SEME7304010	4.0	6	6	10	50	3.85
SEME7304012	4.0	6	6	12	50	3.85
SEME7304014	4.0	6	6	14	60	3.85
SEME7304016	4.0	6	6	16	60	3.85
SEME7304018	4.0	6	6	18	60	3.85
SEME7304020	4.0	6	6	20	60	3.85
SEME7304022	4.0	6	6	22	65	3.85
SEME7304026	4.0	6	6	26	65	3.85
SEME7304030	4.0	6	6	30	70	3.85
SEME7304035	4.0	6	6	35	70	3.85
SEME7304040	4.0	6	6	40	80	3.85
SEME7304045	4.0	6	6	45	90	3.85
SEME7304050	4.0	6	6	50	100	3.85
SEME7304060	4.0	6	6	60	100	3.85
SEME7305016	5.0	6	8	16	60	4.85

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

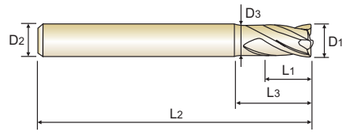
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

PLAIN SHANK **SEME73** SERIES

CARBIDE, 4 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.



CARBIDE | 4 | 30° | PLAIN | Y Coating | p.C436

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
SEME7305020	5.0	6	8	20	60	4.85
SEME7305026	5.0	6	8	26	65	4.85
SEME7305030	5.0	6	8	30	70	4.85
SEME7305035	5.0	6	8	35	75	4.85
SEME7305040	5.0	6	8	40	80	4.85
SEME7305050	5.0	6	8	50	90	4.85
SEME7305060	5.0	6	8	60	100	4.85
SEME7306015	6.0	6	9	15	60	5.85
SEME7306020	6.0	6	9	20	60	5.85
SEME7306030	6.0	6	9	30	70	5.85
SEME7306032	6.0	6	9	32	90	5.85
SEME7308025	8.0	8	12	25	70	7.70
SEME7308030	8.0	8	12	30	80	7.70
SEME7308042	8.0	8	12	42	100	7.70
SEME7310030	10.0	10	15	30	75	9.70
SEME7310035	10.0	10	15	35	80	9.70
SEME7310045	10.0	10	15	45	100	9.70
SEME7312035	12.0	12	20	35	80	11.70
SEME7312040	12.0	12	20	40	90	11.70
SEME7312050	12.0	12	20	50	110	11.70

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

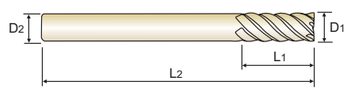
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

4G MILL END MILLS

PLAIN SHANK **SEME75 SERIES**

CARBIDE, 6 FLUTE 45º HELIX (Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to 45 helix angle, better surface roughness can be achieved at side cutting.
- Available various effective length and overall length products.



CARBIDE | 6 | 45° | PLAIN | Y Coating

p.C446

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME75060	6.0	6	15	60	Regular
SEME7506020	6.0	6	20	70	Long
SEME7506030	6.0	6	30	80	Long
SEME7506030110	6.0	6	30	110	Long
SEME75080	8.0	8	20	70	Regular
SEME7508030	8.0	8	30	80	Long
SEME7508035	8.0	8	35	90	Long
SEME7508040	8.0	8	40	90	Long
SEME7508040130	8.0	8	40	130	Long
SEME75100	10.0	10	25	75	Regular
SEME7510030	10.0	10	30	80	Long
SEME7510040	10.0	10	40	90	Long
SEME7510050	10.0	10	50	100	Long
SEME7510050150	10.0	10	50	150	Long
SEME75120	12.0	12	30	80	Regular
SEME7512040	12.0	12	40	90	Long
SEME7512050	12.0	12	50	100	Long
SEME7512060	12.0	12	60	110	Long
SEME7512060150	12.0	12	60	150	Long
SEME75160	16.0	16	40	100	Regular
SEME7516050	16.0	16	50	110	Long
SEME7516060	16.0	16	60	120	Long
SEME7516090	16.0	16	90	150	Long
SEME75160110	16.0	16	110	200	Long
SEME75160110250	16.0	16	110	250	Long
SEME75200	20.0	20	45	100	Regular

▶ NEXT PAGE

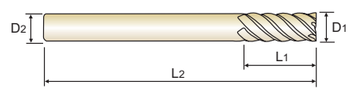
◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE, 6 FLUTE 45º HELIX (Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to 45 helix angle, better surface roughness can be achieved at side cutting.
- Available various effective length and overall length products.



CARBIDE | 6 | 45° | PLAIN | Y Coating

p.C446

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Remark
SEME7520060	20.0	20	60	120	Long
SEME7520070	20.0	20	70	130	Long
SEME75200110	20.0	20	110	200	Long
SEME75200110250	20.0	20	110	250	Long
SEME75200110300	20.0	20	110	300	Long

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

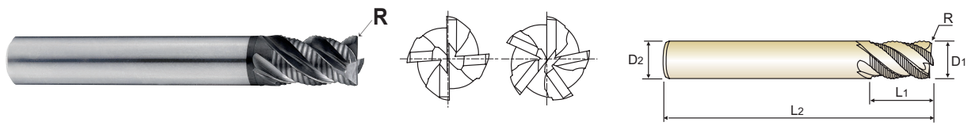
4G MILL END MILLS

X-SPEED ROUGHER

PLAIN SHANK **G9D75 SERIES**
FLAT SHANK **G9D67 SERIES**

CARBIDE, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.



CARBIDE | 4&5 | 44°/45° | PLAIN | FLAT | X Coating

p.C450

◇ Call for Availability

5 Flute, 44°/44.5°/45°

Unit : mm

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
G9D75060	G9D67060	R0.5	**6.0**	6	9	57	4
G9D75080	G9D67080	R0.5	**8.0**	8	12	63	4
G9D75100	G9D67100	R0.5	**10.0**	10	15	72	4
G9D75120	G9D67120	R0.5	**12.0**	12	18	83	4
G9D75160	G9D67160	R1.0	**16.0**	16	24	92	5
G9D75200	G9D67200	R1.0	**20.0**	20	30	104	5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.05	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

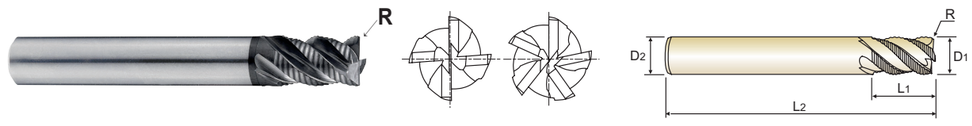
4G MILL END MILLS

X-SPEED ROUGHER

PLAIN SHANK **G9D76 SERIES**
FLAT SHANK **G9D68 SERIES**

CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG LENGTH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.



CARBIDE | 4&5 | 44°/45° | PLAIN | FLAT | X Coating

p.C450

◇ Call for Availability

5 Flute, 44°/44.5°/45°

Unit : mm

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
G9D76060	G9D68060	R0.5	**6.0**	6	12	57	4
G9D76080	G9D68080	R0.5	**8.0**	8	16	63	4
G9D76100	G9D68100	R0.5	**10.0**	10	20	72	4
G9D76120	G9D68120	R0.5	**12.0**	12	24	83	4
G9D76160	G9D68160	R1.0	**16.0**	16	32	92	5
G9D76200	G9D68200	R1.0	**20.0**	20	40	104	5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.05	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

4G MILL END MILLS

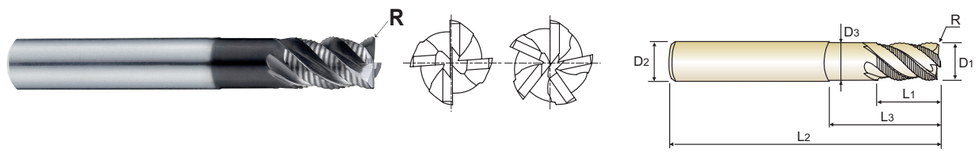
X-SPEED ROUGHER

PLAIN SHANK **G9D77 SERIES**

FLAT SHANK **G9D69 SERIES**

CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG REACH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.



CARBIDE | 4&5 | 44°/45° | PLAIN | FLAT | X Coating

p.C450

◇ Call for Availability

5 Flute, 44°/44.5°/45°

Unit : mm

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	No. of Flute
G9D77060	G9D69060	R0.5	**6.0**	6	9	18	57	5.50	4
G9D77080	G9D69080	R0.5	**8.0**	8	12	24	63	7.50	4
G9D77100	G9D69100	R0.5	**10.0**	10	15	30	72	9.50	4
G9D77120	G9D69120	R0.5	**12.0**	12	18	36	83	11.50	4
G9D77160	G9D69160	R1.0	**16.0**	16	24	48	100	15.50	5
G9D77200	G9D69200	R1.0	**20.0**	20	30	60	110	19.20	5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.05	h5

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

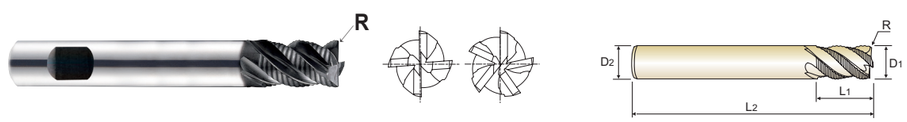
4G MILL END MILLS

X-SPEED ROUGHER

FLAT SHANK **GAE53 SERIES**

HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.



HSS PM | 4&5 | 44°/45° | FLAT | X Coating

p.C452

◇ Call for Availability

5 Flute, 44°/44.5°/45°

Unit : mm

EDP No. FLAT	Corner Radius R	Mill Diameter Metric D1(js12)	Mill Diameter Inch D1(js12)	Shank Diameter D2(h5)	Length of Cut L1	Overall Length L2	No. of Flute
GAE53060	R0.5	**6.0**	.2362	6	13	57	4
GAE53070	R0.5	**7.0**	.2756	10	16	66	4
GAE53080	R0.5	**8.0**	.3150	10	19	69	4
GAE53090	R0.5	**9.0**	.3543	10	19	69	4
GAE53100	R0.5	**10.0**	.3937	10	22	72	4
GAE53120	R0.5	**12.0**	.4724	12	26	83	4
GAE53140	R1.0	**14.0**	.5512	16	26	83	5
GAE53160	R1.0	**16.0**	.6299	16	32	92	5
GAE53180	R1.0	**18.0**	.7087	20	32	92	5
GAE53200	R1.0	**20.0**	.7874	20	38	104	5

Tolerances according to DIN 7160 & 7161

Tolerance range in µm / Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h5	0 / - 6	0 / - 8	0 / - 9	0 / - 11	0 / - 13	0 / - 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	○	○	◎	○	○	○	○			◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

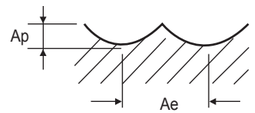
RECOMMENDED CUTTING CONDITIONS

GMF15 SERIES — 2 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

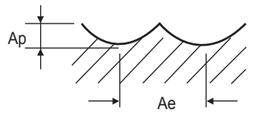
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						.004	.008	.012	.015	.020	.024	.028	.031	.035	3/64	1/16	5/64
P	1-8	Non-alloy steel Low alloy steel	0.08D	0.05D	SFM(Vc)	40	60	95	115	155	185	215	245	280	370	465	615
					IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0021	.0023
					RPM	39400	29530	29530	29490	29530	29530	29530	30480	30370	30240	28350	30050
					IPM(FEED)	21	28	35	44	56	68	79	94	104	122	121	136
	9	Low alloy steel	0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	355	445	590
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0018	.0018	.0020
					RPM	39370	29530	29530	31500	29530	29530	29530	30480	30370	29030	27210	28910
					IPM(FEED)	19	24	31	42	49	58	68	79	90	102	100	114
	10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	SFM(Vc)	40	60	95	115	155	185	215	245	280	370	465	615
					IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0021	.0023
					RPM	39400	29530	29530	29490	29530	29530	29530	30480	30370	30240	28350	30050
					IPM(FEED)	21	28	35	44	56	68	79	94	104	122	121	136
	11.2		0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	355	445	590
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0018	.0018	.0020
					RPM	39370	29530	29530	31500	29530	29530	29530	30480	30370	29030	27210	28910
					IPM(FEED)	19	24	31	42	49	58	68	79	90	102	100	114
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	SFM(Vc)	40	60	95	115	155	185	215	245	280	370	465	615
					IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0015	.0017	.0020	.0021	.0023
					RPM	39400	29530	29530	29490	29530	29530	29530	30480	30370	30240	28350	30050
					IPM(FEED)	21	28	35	44	56	68	79	94	104	122	121	136
H	38.1-38.2	Hardened steel	0.08D	0.05D	SFM(Vc)	35	55	85	110	140	165	195	225	250	320	400	495
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0018	.0018	.0020
					RPM	32480	26570	26570	28350	26570	26570	26570	27430	27330	26000	24380	24190
					IPM(FEED)	16	22	28	37	44	51	60	72	81	92	89	95
	40	Chilled Cast Iron	0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	355	445	590
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0018	.0018	.0020
					RPM	39370	29530	29530	31500	29530	29530	29530	30480	30370	29030	27210	28910
					IPM(FEED)	19	24	31	42	49	58	68	79	90	102	100	114
	41	Hardened Cast Iron	0.08D	0.05D	SFM(Vc)	35	55	85	110	140	165	195	225	250	320	400	495
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0018	.0018	.0020
					RPM	32480	26570	26570	28350	26570	26570	26570	27430	27330	26000	24380	24190
					IPM(FEED)	16	22	28	37	44	51	60	72	81	92	89	95

▶ NEXT PAGE



4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
GMF15 SERIES — 2 FLUTE BALL NOSE - PLANE
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3/32	1/8	3/16	13/64	1/4	9/32	5/16	3/8	1/2	9/16	5/8	3/4
P	1-8	Non-alloy steel Low alloy steel	0.08D	0.05D	SFM(Vc)	615	615	605	575	515	520	550	575	515	540	550	550
					IPT(fz)	.0029	.0036	.0053	.0061	.0069	.0072	.0075	.0078	.0084	.0088	.0094	.0104
					RPM	24990	18770	12310	10820	7880	7070	6710	5860	3940	3670	3370	2800
					IPM(FEED)	145	134	132	133	108	102	100	92	66	65	63	58
	9	Low alloy steel	0.08D	0.05D	SFM(Vc)	590	590	580	550	495	500	530	550	495	520	530	530
					IPT(fz)	.0026	.0033	.0048	.0054	.0060	.0063	.0064	.0069	.0074	.0082	.0081	.0089
					RPM	24040	18030	11820	10350	7600	6820	6470	5610	3780	3530	3240	2710
					IPM(FEED)	125	118	114	112	92	86	83	77	56	58	52	48
	10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	SFM(Vc)	615	615	605	575	515	520	550	575	515	540	550	550
					IPT(fz)	.0029	.0036	.0053	.0061	.0069	.0072	.0075	.0078	.0084	.0088	.0094	.0104
					RPM	24990	18770	12310	10820	7880	7070	6710	5860	3940	3670	3370	2800
					IPM(FEED)	145	134	132	133	108	102	100	92	66	65	63	58
	11.2		0.08D	0.05D	SFM(Vc)	590	590	580	550	495	500	530	550	495	520	530	530
					IPT(fz)	.0026	.0033	.0048	.0054	.0060	.0063	.0064	.0069	.0074	.0082	.0081	.0089
					RPM	24040	18030	11820	10350	7600	6820	6470	5610	3780	3530	3240	2710
					IPM(FEED)	125	118	114	112	92	86	83	77	56	58	52	48
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	SFM(Vc)	615	615	605	575	515	520	550	575	515	540	550	550
					IPT(fz)	.0029	.0036	.0053	.0061	.0069	.0072	.0075	.0078	.0084	.0088	.0094	.0104
					RPM	24990	18770	12310	10820	7880	7070	6710	5860	3940	3670	3370	2800
					IPM(FEED)	145	134	132	133	108	102	100	92	66	65	63	58
H	38.1-38.2	Hardened steel	0.08D	0.05D	SFM(Vc)	495	495	485	465	410	420	445	465	415	435	445	445
					IPT(fz)	.0025	.0030	.0044	.0049	.0055	.0058	.0059	.0063	.0067	.0070	.0075	.0082
					RPM	20160	15120	9920	8720	6240	5680	5440	4720	3170	2970	2720	2270
					IPM(FEED)	99	89	86	86	69	66	64	60	42	42	41	37
	40	Chilled Cast Iron	0.08D	0.05D	SFM(Vc)	590	590	580	550	495	500	530	550	495	520	530	530
					IPT(fz)	.0026	.0033	.0048	.0054	.0060	.0063	.0064	.0069	.0074	.0082	.0081	.0089
					RPM	24040	18030	11820	10350	7600	6820	6470	5610	3780	3530	3240	2710
					IPM(FEED)	125	118	114	112	92	86	83	77	56	58	52	48
	41	Hardened Cast Iron	0.08D	0.05D	SFM(Vc)	495	495	485	465	410	420	445	465	415	435	445	445
					IPT(fz)	.0025	.0030	.0044	.0049	.0055	.0058	.0059	.0063	.0067	.0070	.0075	.0082
					RPM	20160	15120	9920	8720	6240	5680	5440	4720	3170	2970	2720	2270
					IPM(FEED)	99	89	86	86	69	66	64	60	42	42	41	37



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				.008	.008	.012	.012	.012	.015	.015	.015	.015	.020	.020	.020	.020	.020	.020
			LBS	1/64	3/64	3/64	5/64	1/8	3/64	5/64	1/8	5/32	3/64	5/64	1/8	5/32	3/16	1/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	105	95	155	140	125	170	150	150	135	175	175	160	160	160	140
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	49210	44290	49210	44290	39370	43040	38740	38740	34440	33660	33660	30300	30300	30300	26930
			IPM(FEED)	13	10	19	15	12	20	16	16	13	27	27	22	22	22	17
			Ap	.0007	.0003	.0007	.0004	.0003	.0009	.0006	.0004	.0004	.0018	.0013	.0007	.0007	.0004	.0004
	9	Low alloy steel	SFM(Vc)	105	95	155	140	125	160	145	145	130	165	165	150	150	150	135
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	49210	44290	49210	44290	39370	40730	36660	36660	32590	31790	31790	28610	28610	28610	25430
			IPM(FEED)	12	10	17	14	11	18	14	14	11	22	22	18	18	18	14
			Ap	.0006	.0002	.0006	.0004	.0002	.0008	.0004	.0003	.0003	.0015	.0011	.0006	.0006	.0004	.0004
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	105	95	155	140	125	170	150	150	135	175	175	160	160	160	140
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	49210	44290	49210	44290	39370	43040	38740	38740	34440	33660	33660	30300	30300	30300	26930
			IPM(FEED)	13	10	19	15	12	20	16	16	13	27	27	22	22	22	17
			Ap	.0007	.0003	.0007	.0004	.0003	.0009	.0006	.0004	.0004	.0018	.0013	.0007	.0007	.0004	.0004
	11.2		SFM(Vc)	105	95	155	140	125	160	145	145	130	165	165	150	150	150	135
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	49210	44290	49210	44290	39370	40730	36660	36660	32590	31790	31790	28610	28610	28610	25430
			IPM(FEED)	12	10	17	14	11	18	14	14	11	22	22	18	18	18	14
			Ap	.0006	.0002	.0006	.0004	.0002	.0008	.0004	.0003	.0003	.0015	.0011	.0006	.0006	.0004	.0004
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	105	95	155	140	125	170	150	150	135	175	175	160	160	160	140
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	49210	44290	49210	44290	39370	43040	38740	38740	34440	33660	33660	30300	30300	30300	26930
			IPM(FEED)	13	10	19	15	12	20	16	16	13	27	27	22	22	22	17
			Ap	.0007	.0003	.0007	.0004	.0003	.0009	.0006	.0004	.0004	.0018	.0013	.0007	.0007	.0004	.0004
H	38.1-38.2	Hardened steel	SFM(Vc)	90	80	130	120	105	140	125	125	115	145	145	130	130	130	115
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	42520	38270	42130	37910	33700	35910	32310	32310	28720	28050	28050	25250	25250	25250	22440
			IPM(FEED)	10	8	14	11	9	14	11	11	9	20	20	16	16	16	13
			Ap	.0004	.0002	.0004	.0002	.0002	.0005	.0003	.0002	.0002	.0010	.0007	.0004	.0004	.0002	.0002
	40	Chilled Cast Iron	SFM(Vc)	105	95	155	140	125	160	145	145	130	165	165	150	150	150	135
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	49210	44290	49210	44290	39370	40730	36660	36660	32590	31790	31790	28610	28610	28610	25430
			IPM(FEED)	12	10	17	14	11	18	14	14	11	22	22	18	18	18	14
			Ap	.0006	.0002	.0006	.0004	.0002	.0008	.0004	.0003	.0003	.0015	.0011	.0006	.0006	.0004	.0004
	41	Hardened Cast Iron	SFM(Vc)	90	80	130	120	105	140	125	125	115	145	145	130	130	130	115
			IPT(fz)	.0001	.0001	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	42520	38270	42130	37910	33700	35910	32310	32310	28720	28050	28050	25250	25250	25250	22440
			IPM(FEED)	10	8	14	11	9	14	11	11	9	20	20	16	16	16	13
			Ap	.0004	.0002	.0004	.0002	.0002	.0005	.0003	.0002	.0002	.0010	.0007	.0004	.0004	.0002	.0002

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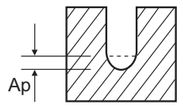
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				.020	.020	.024	.024	.024	.024	.024	.024	.024	.024	1/32	1/32	1/32	1/32	1/32
			LBS	5/16	3/8	5/64	1/8	5/32	3/16	1/4	5/16	3/8	1/2	5/64	1/8	5/32	3/16	1/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	105	105	210	190	190	190	170	170	125	65	280	280	280	255	255
			IPT(fz)	.0003	.0003	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0006	.0006
			RPM	20200	20200	33660	30300	30300	30300	26930	26930	20200	10100	34470	34470	34470	31020	31020
			IPM(FEED)	11	11	40	32	32	32	25	25	17	7	49	49	49	40	40
			Ap	.0003	.0002	.0015	.0009	.0009	.0009	.0006	.0003	.0003	.0002	.0028	.0020	.0020	.0011	.0011
	9	Low alloy steel	SFM(Vc)	100	100	200	180	180	180	160	160	120	60	265	265	265	240	240
			IPT(fz)	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006
			RPM	19070	19070	31790	28610	28610	28610	25430	25430	19070	9540	32550	32550	32550	29300	29300
			IPM(FEED)	10	10	33	26	26	26	21	21	14	6	41	41	41	33	33
			Ap	.0002	.0002	.0013	.0007	.0007	.0007	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	105	105	210	190	190	190	170	170	125	65	280	280	280	255	255
			IPT(fz)	.0003	.0003	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0006	.0006
			RPM	20200	20200	33660	30300	30300	30300	26930	26930	20200	10100	34470	34470	34470	31020	31020
			IPM(FEED)	11	11	40	32	32	32	25	25	17	7	49	49	49	40	40
			Ap	.0003	.0002	.0015	.0009	.0009	.0009	.0006	.0003	.0003	.0002	.0028	.0020	.0020	.0011	.0011
	11.2		SFM(Vc)	100	100	200	180	180	180	160	160	120	60	265	265	265	240	240
			IPT(fz)	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006
			RPM	19070	19070	31790	28610	28610	28610	25430	25430	19070	9540	32550	32550	32550	29300	29300
			IPM(FEED)	10	10	33	26	26	26	21	21	14	6	41	41	41	33	33
			Ap	.0002	.0002	.0013	.0007	.0007	.0007	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	105	105	210	190	190	190	170	170	125	65	280	280	280	255	255
			IPT(fz)	.0003	.0003	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0007	.0006	.0006
			RPM	20200	20200	33660	30300	30300	30300	26930	26930	20200	10100	34470	34470	34470	31020	31020
			IPM(FEED)	11	11	40	32	32	32	25	25	17	7	49	49	49	40	40
			Ap	.0003	.0002	.0015	.0009	.0009	.0009	.0006	.0003	.0003	.0002	.0028	.0020	.0020	.0011	.0011
H	38.1-38.2	Hardened steel	SFM(Vc)	90	90	175	160	160	160	140	140	105	55	235	235	235	210	210
			IPT(fz)	.0003	.0003	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005
			RPM	16830	16830	28050	25250	25250	25250	22440	22440	16830	8420	28720	28720	28720	25850	25850
			IPM(FEED)	9	9	27	22	22	22	17	17	11	5	34	34	34	28	28
			Ap	.0002	.0000	.0008	.0005	.0005	.0005	.0003	.0002	.0002	.0001	.0016	.0011	.0011	.0006	.0006
	40	Chilled Cast Iron	SFM(Vc)	100	100	200	180	180	180	160	160	120	60	265	265	265	240	240
			IPT(fz)	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0006	.0006	.0006	.0006	.0006
			RPM	19070	19070	31790	28610	28610	28610	25430	25430	19070	9540	32550	32550	32550	29300	29300
			IPM(FEED)	10	10	33	26	26	26	21	21	14	6	41	41	41	33	33
			Ap	.0002	.0002	.0013	.0007	.0007	.0007	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
	41	Hardened Cast Iron	SFM(Vc)	90	90	175	160	160	160	140	140	105	55	235	235	235	210	210
			IPT(fz)	.0003	.0003	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0005	.0005
			RPM	16830	16830	28050	25250	25250	25250	22440	22440	16830	8420	28720	28720	28720	25850	25850
			IPM(FEED)	9	9	27	22	22	22	17	17	11	5	34	34	34	28	28
			Ap	.0002	.0000	.0008	.0005	.0005	.0005	.0003	.0002	.0002	.0001	.0016	.0011	.0011	.0006	.0006

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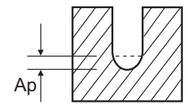
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				1/32	1/32	3/64	3/64	3/64	3/64	3/64	3/64	3/64	3/64	3/64	1/16	1/16	1/16
			LBS	5/16	3/8	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	3/4	5/32	1/4	5/16
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	255	225	325	325	325	295	295	295	260	260	260	195	370	370	370
			IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0013	.0013	.0013
			RPM	31020	27580	26510	26510	26510	23860	23860	23860	21210	21210	21210	15900	22580	22580	22580
			IPM(FEED)	40	31	55	55	55	44	44	44	35	35	35	23	59	59	59
			Ap	.0007	.0007	.0042	.0030	.0030	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039
	9	Low alloy steel	SFM(Vc)	240	215	305	305	305	275	275	275	245	245	245	185	350	350	350
			IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0012	.0012	.0012
			RPM	29300	26040	25000	25000	25000	22500	22500	22500	20000	20000	20000	15000	21350	21350	21350
			IPM(FEED)	33	26	46	46	46	37	37	37	29	29	29	19	50	50	50
			Ap	.0006	.0006	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0005	.0005	.0047	.0033	.0033
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	255	225	325	325	325	295	295	295	260	260	260	195	370	370	370
			IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0013	.0013	.0013
			RPM	31020	27580	26510	26510	26510	23860	23860	23860	21210	21210	21210	15900	22580	22580	22580
			IPM(FEED)	40	31	55	55	55	44	44	44	35	35	35	23	59	59	59
			Ap	.0007	.0007	.0042	.0030	.0030	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039
	11.2		SFM(Vc)	240	215	305	305	305	275	275	275	245	245	245	185	350	350	350
			IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0012	.0012	.0012
			RPM	29300	26040	25000	25000	25000	22500	22500	22500	20000	20000	20000	15000	21350	21350	21350
			IPM(FEED)	33	26	46	46	46	37	37	37	29	29	29	19	50	50	50
			Ap	.0006	.0006	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0005	.0005	.0047	.0033	.0033
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	255	225	325	325	325	295	295	295	260	260	260	195	370	370	370
			IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0013	.0013	.0013
			RPM	31020	27580	26510	26510	26510	23860	23860	23860	21210	21210	21210	15900	22580	22580	22580
			IPM(FEED)	40	31	55	55	55	44	44	44	35	35	35	23	59	59	59
			Ap	.0007	.0007	.0042	.0030	.0030	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039
H	38.1-38.2	Hardened steel	SFM(Vc)	210	190	270	270	270	245	245	245	215	215	215	160	310	310	310
			IPT(fz)	.0005	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0011	.0011	.0011
			RPM	25850	22980	22070	22070	22070	19870	19870	19870	17660	17660	17660	13240	18900	18900	18900
			IPM(FEED)	28	22	38	38	38	31	31	31	24	24	24	16	40	40	40
			Ap	.0004	.0004	.0024	.0017	.0017	.0009	.0009	.0009	.0006	.0006	.0004	.0004	.0031	.0022	.0022
	40	Chilled Cast Iron	SFM(Vc)	240	215	305	305	305	275	275	275	245	245	245	185	350	350	350
			IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0012	.0012	.0012
			RPM	29300	26040	25000	25000	25000	22500	22500	22500	20000	20000	20000	15000	21350	21350	21350
			IPM(FEED)	33	26	46	46	46	37	37	37	29	29	29	19	50	50	50
			Ap	.0006	.0006	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0005	.0005	.0047	.0033	.0033
	41	Hardened Cast Iron	SFM(Vc)	210	190	270	270	270	245	245	245	215	215	215	160	310	310	310
			IPT(fz)	.0005	.0005	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0011	.0011	.0011
			RPM	25850	22980	22070	22070	22070	19870	19870	19870	17660	17660	17660	13240	18900	18900	18900
			IPM(FEED)	28	22	38	38	38	31	31	31	24	24	24	16	40	40	40
			Ap	.0004	.0004	.0024	.0017	.0017	.0009	.0009	.0009	.0006	.0006	.0004	.0004	.0031	.0022	.0022

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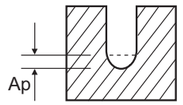
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				1/16	1/16	1/16	1/16	1/16	5/64	5/64	5/64	5/64	5/64	5/64	5/64	5/64	5/64	5/64
			LBS	3/8	1/2	9/16	5/8	3/4	1/4	5/16	3/8	1/2	9/16	5/8	11/16	3/4	1	1-3/16
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	330	330	330	330	295	370	370	370	335	335	335	335	335	295	225
			IPT(fz)	.0012	.0012	.0012	.0012	.0010	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0014
			RPM	20320	20320	20320	20320	18070	18140	18140	18140	16330	16330	16330	16330	16330	14510	10890
			IPM(FEED)	48	48	48	48	38	71	71	71	58	58	58	58	58	46	30
			Ap	.0022	.0022	.0014	.0014	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0018	.0018	.0011
	9	Low alloy steel	SFM(Vc)	315	315	315	315	280	350	350	350	315	315	315	315	315	280	210
			IPT(fz)	.0011	.0011	.0011	.0011	.0009	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0012
			RPM	19220	19220	19220	19220	17080	17130	17130	17130	15420	15420	15420	15420	15420	13710	10280
			IPM(FEED)	41	41	41	41	32	60	60	60	49	49	49	49	49	39	25
			Ap	.0019	.0019	.0012	.0012	.0012	.0041	.0041	.0041	.0024	.0024	.0024	.0015	.0015	.0015	.0009
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	330	330	330	330	295	370	370	370	335	335	335	335	335	295	225
			IPT(fz)	.0012	.0012	.0012	.0012	.0010	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0014
			RPM	20320	20320	20320	20320	18070	18140	18140	18140	16330	16330	16330	16330	16330	14510	10890
			IPM(FEED)	48	48	48	48	38	71	71	71	58	58	58	58	58	46	30
			Ap	.0022	.0022	.0014	.0014	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0018	.0018	.0011
	11.2		SFM(Vc)	315	315	315	315	280	350	350	350	315	315	315	315	315	280	210
			IPT(fz)	.0011	.0011	.0011	.0011	.0009	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0012
			RPM	19220	19220	19220	19220	17080	17130	17130	17130	15420	15420	15420	15420	15420	13710	10280
			IPM(FEED)	41	41	41	41	32	60	60	60	49	49	49	49	49	39	25
			Ap	.0019	.0019	.0012	.0012	.0012	.0041	.0041	.0041	.0024	.0024	.0024	.0015	.0015	.0015	.0009
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	330	330	330	330	295	370	370	370	335	335	335	335	335	295	225
			IPT(fz)	.0012	.0012	.0012	.0012	.0010	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0014
			RPM	20320	20320	20320	20320	18070	18140	18140	18140	16330	16330	16330	16330	16330	14510	10890
			IPM(FEED)	48	48	48	48	38	71	71	71	58	58	58	58	58	46	30
			Ap	.0022	.0022	.0014	.0014	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0018	.0018	.0011
H	38.1-38.2	Hardened steel	SFM(Vc)	280	280	280	280	245	310	310	310	280	280	280	280	280	245	185
			IPT(fz)	.0010	.0010	.0010	.0010	.0008	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0014	.0012
			RPM	17010	17010	17010	17010	15120	15120	15120	15120	13610	13610	13610	13610	13610	12090	9070
			IPM(FEED)	33	33	33	33	26	51	51	51	41	41	41	41	41	33	22
			Ap	.0013	.0013	.0008	.0008	.0008	.0027	.0027	.0027	.0016	.0016	.0016	.0010	.0010	.0010	.0006
	40	Chilled Cast Iron	SFM(Vc)	315	315	315	315	280	350	350	350	315	315	315	315	315	280	210
			IPT(fz)	.0011	.0011	.0011	.0011	.0009	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0012
			RPM	19220	19220	19220	19220	17080	17130	17130	17130	15420	15420	15420	15420	15420	13710	10280
			IPM(FEED)	41	41	41	41	32	60	60	60	49	49	49	49	49	39	25
			Ap	.0019	.0019	.0012	.0012	.0012	.0041	.0041	.0041	.0024	.0024	.0024	.0015	.0015	.0015	.0009
	41	Hardened Cast Iron	SFM(Vc)	280	280	280	280	245	310	310	310	280	280	280	280	280	245	185
			IPT(fz)	.0010	.0010	.0010	.0010	.0008	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0014	.0012
			RPM	17010	17010	17010	17010	15120	15120	15120	15120	13610	13610	13610	13610	13610	12090	9070
			IPM(FEED)	33	33	33	33	26	51	51	51	41	41	41	41	41	33	22
			Ap	.0013	.0013	.0008	.0008	.0008	.0027	.0027	.0027	.0016	.0016	.0016	.0010	.0010	.0010	.0006

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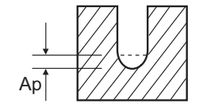
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				3/32	3/32	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16
			LBS	3/8	3/4	5/16	3/8	1/2	9/16	5/8	11/16	3/4	1	1-3/16	1-3/8	3/8	1/2	9/16	5/8
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	405	365	425	425	425	425	425	380	380	380	380	340	405	405	405	405
			IPT(fz)	.0024	.0022	.0029	.0029	.0029	.0029	.0029	.0027	.0027	.0027	.0027	.0024	.0039	.0039	.0039	.0039
			RPM	16590	14930	12940	12940	12940	12940	12940	11650	11650	11650	11650	10360	8230	8230	8230	8230
			IPM(FEED)	80	64	76	76	76	76	76	62	62	62	62	49	65	65	65	65
			Ap	.0059	.0034	.0113	.0113	.0079	.0079	.0079	.0045	.0045	.0045	.0028	.0028	.0169	.0169	.0169	.0118
	9	Low alloy steel	SFM(Vc)	385	345	400	400	400	400	400	360	360	360	360	320	385	385	385	385
			IPT(fz)	.0021	.0019	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0024	.0021	.0035	.0035	.0035	.0035
			RPM	15640	14080	12190	12190	12190	12190	12190	10970	10970	10970	10970	9750	7810	7810	7810	7810
			IPM(FEED)	66	54	64	64	64	64	64	52	52	52	52	41	55	55	55	55
			Ap	.0049	.0028	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0037	.0024	.0024	.0141	.0141	.0141	.0098
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	405	365	425	425	425	425	425	380	380	380	380	340	405	405	405	405
			IPT(fz)	.0024	.0022	.0029	.0029	.0029	.0029	.0029	.0027	.0027	.0027	.0027	.0024	.0039	.0039	.0039	.0039
			RPM	16590	14930	12940	12940	12940	12940	12940	11650	11650	11650	11650	10360	8230	8230	8230	8230
			IPM(FEED)	80	64	76	76	76	76	76	62	62	62	62	49	65	65	65	65
			Ap	.0059	.0034	.0113	.0113	.0079	.0079	.0079	.0045	.0045	.0045	.0028	.0028	.0169	.0169	.0169	.0118
	11.2		SFM(Vc)	385	345	400	400	400	400	400	360	360	360	360	320	385	385	385	385
			IPT(fz)	.0021	.0019	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0024	.0021	.0035	.0035	.0035	.0035
			RPM	15640	14080	12190	12190	12190	12190	12190	10970	10970	10970	10970	9750	7810	7810	7810	7810
			IPM(FEED)	66	54	64	64	64	64	64	52	52	52	52	41	55	55	55	55
			Ap	.0049	.0028	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0037	.0024	.0024	.0141	.0141	.0141	.0098
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	405	365	425	425	425	425	425	380	380	380	380	340	405	405	405	405
			IPT(fz)	.0024	.0022	.0029	.0029	.0029	.0029	.0029	.0027	.0027	.0027	.0027	.0024	.0039	.0039	.0039	.0039
			RPM	16590	14930	12940	12940	12940	12940	12940	11650	11650	11650	11650	10360	8230	8230	8230	8230
			IPM(FEED)	80	64	76	76	76	76	76	62	62	62	62	49	65	65	65	65
			Ap	.0059	.0034	.0113	.0113	.0079	.0079	.0079	.0045	.0045	.0045	.0028	.0028	.0169	.0169	.0169	.0118
H	38.1-38.2	Hardened steel	SFM(Vc)	340	305	350	350	350	350	350	315	315	315	315	280	340	340	340	340
			IPT(fz)	.0019	.0018	.0025	.0025	.0025	.0025	.0025	.0022	.0022	.0022	.0022	.0020	.0033	.0033	.0033	.0033
			RPM	13860	12470	10770	10770	10770	10770	10770	9690	9690	9690	9690	8620	6890	6890	6890	6890
			IPM(FEED)	54	44	53	53	53	53	53	43	43	43	43	34	46	46	46	46
			Ap	.0033	.0019	.0063	.0063	.0044	.0044	.0044	.0025	.0025	.0025	.0016	.0016	.0094	.0094	.0094	.0066
	40	Chilled Cast Iron	SFM(Vc)	385	345	400	400	400	400	400	360	360	360	360	320	385	385	385	385
			IPT(fz)	.0021	.0019	.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0024	.0021	.0035	.0035	.0035	.0035
			RPM	15640	14080	12190	12190	12190	12190	12190	10970	10970	10970	10970	9750	7810	7810	7810	7810
			IPM(FEED)	66	54	64	64	64	64	64	52	52	52	52	41	55	55	55	55
			Ap	.0049	.0028	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0037	.0024	.0024	.0141	.0141	.0141	.0098
	41	Hardened Cast Iron	SFM(Vc)	340	305	350	350	350	350	350	315	315	315	315	280	340	340	340	340
			IPT(fz)	.0019	.0018	.0025	.0025	.0025	.0025	.0025	.0022	.0022	.0022	.0022	.0020	.0033	.0033	.0033	.0033
			RPM	13860	12470	10770	10770	10770	10770	10770	9690	9690	9690	9690	8620	6890	6890	6890	6890
			IPM(FEED)	54	44	53	53	53	53	53	43	43	43	43	34	46	46	46	46
			Ap	.0033	.0019	.0063	.0063	.0044	.0044	.0044	.0025	.0025	.0025	.0016	.0016	.0094	.0094	.0094	.0066

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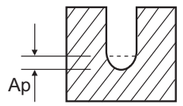
(Depth of Cut per one pass)



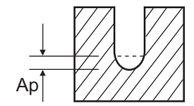
4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF16 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)														
				3/16	3/16	3/16	3/16	3/16	3/16	13/64	1/4	1/4	5/16	5/16	3/8	3/8	3/8	1/2	1/2
			LBS	11/16	3/4	1	1-3/16	1-3/8	1-1/2	13/64	3/4	1-3/16	1	1-3/8	1-3/16	1-3/16	1-1/2	1-1/4	1-1/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	405	405	365	365	365	365	355	400	400	400	400	395	395	395	395	395
			IPT(fz)	.0039	.0039	.0035	.0035	.0035	.0035	.0042	.0058	.0058	.0073	.0073	.0084	.0084	.0084	.0094	.0094
			RPM	8230	8230	7410	7410	7410	7410	6720	6140	6140	4890	4890	4040	4040	4040	3020	3020
			IPM(FEED)	65	65	53	53	53	53	57	71	71	72	72	68	68	68	57	57
			Ap	.0118	.0118	.0067	.0067	.0067	.0067	.0073	.0225	.0157	.0197	.0197	.0236	.0236	.0236	.0450	.0450
	9	Low alloy steel	SFM(Vc)	385	385	345	345	345	345	340	385	385	380	380	380	380	380	375	375
			IPT(fz)	.0035	.0035	.0032	.0032	.0032	.0032	.0035	.0051	.0051	.0064	.0064	.0075	.0075	.0075	.0084	.0084
			RPM	7810	7810	7030	7030	7030	7030	6370	5860	5860	4640	4640	3860	3860	3860	2880	2880
			IPM(FEED)	55	55	45	45	45	45	45	60	60	60	60	58	58	58	48	48
			Ap	.0098	.0098	.0056	.0056	.0056	.0056	.0061	.0187	.0131	.0164	.0164	.0197	.0197	.0197	.0375	.0375
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	405	405	365	365	365	365	355	400	400	400	400	395	395	395	395	395
			IPT(fz)	.0039	.0039	.0035	.0035	.0035	.0035	.0042	.0058	.0058	.0073	.0073	.0084	.0084	.0084	.0094	.0094
			RPM	8230	8230	7410	7410	7410	7410	6720	6140	6140	4890	4890	4040	4040	4040	3020	3020
			IPM(FEED)	65	65	53	53	53	53	57	71	71	72	72	68	68	68	57	57
			Ap	.0118	.0118	.0067	.0067	.0067	.0067	.0073	.0225	.0157	.0197	.0197	.0236	.0236	.0236	.0450	.0450
	11.2		SFM(Vc)	385	385	345	345	345	345	340	385	385	380	380	380	380	380	375	375
			IPT(fz)	.0035	.0035	.0032	.0032	.0032	.0032	.0035	.0051	.0051	.0064	.0064	.0075	.0075	.0075	.0084	.0084
			RPM	7810	7810	7030	7030	7030	7030	6370	5860	5860	4640	4640	3860	3860	3860	2880	2880
			IPM(FEED)	55	55	45	45	45	45	45	60	60	60	60	58	58	58	48	48
			Ap	.0098	.0098	.0056	.0056	.0056	.0056	.0061	.0187	.0131	.0164	.0164	.0197	.0197	.0197	.0375	.0375
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	405	405	365	365	365	365	355	400	400	400	400	395	395	395	395	395
			IPT(fz)	.0039	.0039	.0035	.0035	.0035	.0035	.0042	.0058	.0058	.0073	.0073	.0084	.0084	.0084	.0094	.0094
			RPM	8230	8230	7410	7410	7410	7410	6720	6140	6140	4890	4890	4040	4040	4040	3020	3020
			IPM(FEED)	65	65	53	53	53	53	57	71	71	72	72	68	68	68	57	57
			Ap	.0118	.0118	.0067	.0067	.0067	.0067	.0073	.0225	.0157	.0197	.0197	.0236	.0236	.0236	.0450	.0450
H	38.1-38.2	Hardened steel	SFM(Vc)	340	340	305	305	305	305	295	340	340	330	330	330	330	330	325	325
			IPT(fz)	.0033	.0033	.0030	.0030	.0030	.0030	.0036	.0048	.0048	.0063	.0063	.0074	.0074	.0074	.0082	.0082
			RPM	6890	6890	6200	6200	6200	6200	5580	5200	5200	4030	4030	3360	3360	3360	2500	2500
			IPM(FEED)	46	46	37	37	37	37	40	49	49	51	51	50	50	50	41	41
			Ap	.0066	.0066	.0037	.0037	.0037	.0037	.0041	.0125	.0087	.0109	.0190	.0131	.0131	.0131	.0250	.0250
	40	Chilled Cast Iron	SFM(Vc)	385	385	345	345	345	345	340	385	385	380	380	380	380	380	375	375
			IPT(fz)	.0035	.0035	.0032	.0032	.0032	.0032	.0035	.0051	.0051	.0064	.0064	.0075	.0075	.0075	.0084	.0084
			RPM	7810	7810	7030	7030	7030	7030	6370	5860	5860	4640	4640	3860	3860	3860	2880	2880
			IPM(FEED)	55	55	45	45	45	45	45	60	60	60	60	58	58	58	48	48
			Ap	.0098	.0098	.0056	.0056	.0056	.0056	.0061	.0187	.0131	.0164	.0164	.0197	.0197	.0197	.0375	.0375
	41	Hardened Cast Iron	SFM(Vc)	340	340	305	305	305	305	295	340	340	330	330	330	330	330	325	325
			IPT(fz)	.0033	.0033	.0030	.0030	.0030	.0030	.0036	.0048	.0048	.0063	.0063	.0074	.0074	.0074	.0082	.0082
			RPM	6890	6890	6200	6200	6200	6200	5580	5200	5200	4030	4030	3360	3360	3360	2500	2500
			IPM(FEED)	46	46	37	37	37	37	40	49	49	51	51	50	50	50	41	41
			Ap	.0066	.0066	.0037	.0037	.0037	.0037	.0041	.0125	.0087	.0109	.0190	.0131	.0131	.0131	.0250	.0250

(Depth of Cut per one pass)

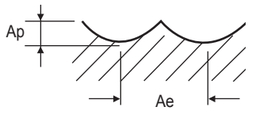


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF17 SERIES — 4 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2
P	1-8	Non-alloy steel Low alloy steel	0.05D	0.02D	SFM(Vc)	745	865	940	935	940	940
					IPT(fz)	.0022	.0032	.0040	.0046	.0049	.0055
					RPM	22700	17600	14400	11400	9600	7200
					IPM(FEED)	202	224	231	208	190	159
	9	Low alloy steel	0.05D	0.02D	SFM(Vc)	540	640	755	760	760	760
					IPT(fz)	.0022	.0029	.0036	.0043	.0046	.0051
					RPM	16540	13020	11530	9270	7720	5790
					IPM(FEED)	144	153	167	158	143	119
	10-11.1	High alloyed steel, and tool steel	0.08D	0.02D	SFM(Vc)	745	865	940	935	940	940
					IPT(fz)	.0022	.0032	.0040	.0046	.0049	.0055
					RPM	22700	17600	14400	11400	9600	7200
					IPM(FEED)	202	224	231	208	190	159
	11.2		0.05D	0.02D	SFM(Vc)	540	640	755	760	760	760
					IPT(fz)	.0022	.0029	.0036	.0043	.0046	.0051
					RPM	16540	13020	11530	9270	7720	5790
					IPM(FEED)	144	153	167	158	143	119
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	0.02D	SFM(Vc)	745	865	940	935	940	940
					IPT(fz)	.0022	.0032	.0040	.0046	.0049	.0055
					RPM	22700	17600	14400	11400	9600	7200
					IPM(FEED)	202	224	231	208	190	159
H	38.1-38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	495	600	685	685	685	685
					IPT(fz)	.0022	.0029	.0034	.0040	.0042	.0043
					RPM	15120	12250	10490	8390	6990	5230
					IPM(FEED)	136	144	143	133	119	89
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	540	640	755	760	760	760
					IPT(fz)	.0022	.0029	.0036	.0043	.0046	.0051
					RPM	16540	13020	11530	9270	7720	5790
					IPM(FEED)	144	153	167	158	143	119
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	495	600	685	685	685	685
					IPT(fz)	.0022	.0029	.0034	.0040	.0042	.0043
					RPM	15120	12250	10490	8390	6990	5230
					IPM(FEED)	136	144	143	133	119	89

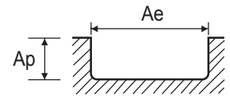


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF18 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/64	1/16	5/64	1/8	9/64	13/64	1/4	5/16	3/8	1/2	9/16	5/8	3/4
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.2D	SFM(Vc)	305	340	370	410	430	475	490	490	520	510	515	505	510
					IPT(fz)	.0002	.0002	.0003	.0004	.0005	.0009	.0012	.0018	.0021	.0020	.0021	.0023	.0022
					RPM	25000	20800	18100	12500	11700	8900	7500	6000	5300	3900	3500	3100	2600
					IPM(FEED)	10	9	10	10	12	16	19	22	22	16	15	14	12
	9	Low alloy steel	1.0D	0.2D	SFM(Vc)	195	210	240	265	280	300	310	315	340	345	350	345	340
					IPT(fz)	.0001	.0002	.0002	.0003	.0004	.0007	.0010	.0013	.0015	.0016	.0016	.0016	.0014
					RPM	15870	12760	11650	8090	7540	5620	4760	3830	3440	2630	2390	2120	1720
					IPM(FEED)	4	4	5	5	6	8	9	10	10	9	8	7	5
	10-11.1	High alloyed steel, and tool steel	1.0D	0.2D	SFM(Vc)	305	340	370	410	430	475	490	490	520	510	515	505	510
					IPT(fz)	.0002	.0002	.0003	.0004	.0005	.0009	.0012	.0018	.0021	.0020	.0021	.0023	.0022
					RPM	25000	20800	18100	12500	11700	8900	7500	6000	5300	3900	3500	3100	2600
					IPM(FEED)	10	9	10	10	12	16	19	22	22	16	15	14	12
	11.2		1.0D	0.2D	SFM(Vc)	195	210	240	265	280	300	310	315	340	345	350	345	340
					IPT(fz)	.0001	.0002	.0002	.0003	.0004	.0007	.0010	.0013	.0015	.0016	.0016	.0016	.0014
					RPM	15870	12760	11650	8090	7540	5620	4760	3830	3440	2630	2390	2120	1720
					IPM(FEED)	4	4	5	5	6	8	9	10	10	9	8	7	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.2D	SFM(Vc)	305	340	370	410	430	475	490	490	520	510	515	505	510
					IPT(fz)	.0002	.0002	.0003	.0004	.0005	.0009	.0012	.0018	.0021	.0020	.0021	.0023	.0022
					RPM	25000	20800	18100	12500	11700	8900	7500	6000	5300	3900	3500	3100	2600
					IPM(FEED)	10	9	10	10	12	16	19	22	22	16	15	14	12
H	38.1-38.2	Hardened steel	1.0D	0.2D	SFM(Vc)	120	130	150	165	175	195	205	210	210	210	215	210	205
					IPT(fz)	.0001	.0001	.0002	.0003	.0003	.0005	.0007	.0009	.0012	.0012	.0012	.0012	.0012
					RPM	9830	8030	7260	4990	4690	3680	3100	2540	2120	1590	1450	1290	1050
					IPM(FEED)	2	2	3	3	3	4	5	5	5	4	4	3	3
	40	Chilled Cast Iron	1.0D	0.2D	SFM(Vc)	195	210	240	265	280	300	310	315	340	345	350	345	340
					IPT(fz)	.0001	.0002	.0002	.0003	.0004	.0007	.0010	.0013	.0015	.0016	.0016	.0016	.0014
					RPM	15870	12760	11650	8090	7540	5620	4760	3830	3440	2630	2390	2120	1720
					IPM(FEED)	4	4	5	5	6	8	9	10	10	9	8	7	5
	41	Hardened Cast Iron	1.0D	0.2D	SFM(Vc)	120	130	150	165	175	195	205	210	210	210	215	210	205
					IPT(fz)	.0001	.0001	.0002	.0003	.0003	.0005	.0007	.0009	.0012	.0012	.0012	.0012	.0012
					RPM	9830	8030	7260	4990	4690	3680	3100	2540	2120	1590	1450	1290	1050
					IPM(FEED)	2	2	3	3	3	4	5	5	5	4	4	3	3



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF19 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				.008	.012	.012	.015	.015	.015	.015	.020	.020	.020	.020	.020	.024	.024
			LBS	3/64	3/64	5/64	3/64	1/16	5/64	3/32	3/64	1/16	5/64	1/8	5/32	5/64	1/8
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	95	155	140	205	205	185	185	220	220	220	200	200	225	205
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	44290	49210	44290	52490	52490	47240	47240	42320	42320	42320	38090	38090	35830	32240
			IPM(FEED)	5	8	6	8	8	7	7	9	9	9	7	7	10	8
			Ap	.0006	.0017	.0009	.0021	.0021	.0012	.0012	.0040	.0028	.0028	.0016	.0016	.0033	.0019
	9	Low alloy steel	SFM(Vc)	65	100	90	130	130	120	120	145	145	145	130	130	150	135
			IPT(fz)	.0000	.0001	.0000	.0001	.0001	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	30560	31500	28350	33600	33600	30240	30240	27560	27560	27560	24800	24800	23620	21260
			IPM(FEED)	2	3	3	4	4	3	3	4	4	4	3	3	4	4
			Ap	.0005	.0013	.0007	.0016	.0016	.0009	.0009	.0030	.0021	.0021	.0012	.0012	.0025	.0015
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	95	155	140	205	205	185	185	220	220	220	200	200	225	205
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	44290	49210	44290	52490	52490	47240	47240	42320	42320	42320	38090	38090	35830	32240
			IPM(FEED)	5	8	6	8	8	7	7	9	9	9	7	7	10	8
			Ap	.0006	.0017	.0009	.0021	.0021	.0012	.0012	.0040	.0028	.0028	.0016	.0016	.0033	.0019
	11.2		SFM(Vc)	65	100	90	130	130	120	120	145	145	145	130	130	150	135
			IPT(fz)	.0000	.0001	.0000	.0001	.0001	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	30560	31500	28350	33600	33600	30240	30240	27560	27560	27560	24800	24800	23620	21260
			IPM(FEED)	2	3	3	4	4	3	3	4	4	4	3	3	4	4
			Ap	.0005	.0013	.0007	.0016	.0016	.0009	.0009	.0030	.0021	.0021	.0012	.0012	.0025	.0015
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	95	155	140	205	205	185	185	220	220	220	200	200	225	205
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	44290	49210	44290	52490	52490	47240	47240	42320	42320	42320	38090	38090	35830	32240
			IPM(FEED)	5	8	6	8	8	7	7	9	9	9	7	7	10	8
			Ap	.0006	.0017	.0009	.0021	.0021	.0012	.0012	.0040	.0028	.0028	.0016	.0016	.0033	.0019
H	38.1-38.2	Hardened steel	SFM(Vc)	40	60	55	80	80	75	75	90	90	90	80	80	90	80
			IPT(fz)	.0000	.0001	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	18740	19690	17720	21000	21000	18900	18900	16830	16830	16830	15150	15150	14270	12840
			IPM(FEED)	1	2	2	2	2	2	2	2	2	2	2	2	3	2
			Ap	.0004	.0010	.0006	.0013	.0013	.0007	.0007	.0024	.0017	.0017	.0009	.0009	.0020	.0011
	40	Chilled Cast Iron	SFM(Vc)	65	100	90	130	130	120	120	145	145	145	130	130	150	135
			IPT(fz)	.0000	.0001	.0000	.0001	.0001	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	30560	31500	28350	33600	33600	30240	30240	27560	27560	27560	24800	24800	23620	21260
			IPM(FEED)	2	3	3	4	4	3	3	4	4	4	3	3	4	4
			Ap	.0005	.0013	.0007	.0016	.0016	.0009	.0009	.0030	.0021	.0021	.0012	.0012	.0025	.0015
	41	Hardened Cast Iron	SFM(Vc)	40	60	55	80	80	75	75	90	90	90	80	80	90	80
			IPT(fz)	.0000	.0001	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	18740	19690	17720	21000	21000	18900	18900	16830	16830	16830	15150	15150	14270	12840
			IPM(FEED)	1	2	2	2	2	2	2	2	2	2	2	2	3	2
			Ap	.0004	.0010	.0006	.0013	.0013	.0007	.0007	.0024	.0017	.0017	.0009	.0009	.0020	.0011

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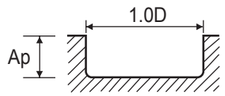

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF19 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				.024	.024	.031	.031	.031	.031	3/64	3/64	3/64	3/64	3/64	1/16	1/16	1/16
			LBS	5/32	1/4	5/64	5/32	1/4	5/16	1/8	5/32	1/4	5/16	3/8	5/32	1/4	5/16
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	205	180	300	270	270	240	340	340	305	305	305	410	410	410
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	32240	28660	36980	33280	33280	29590	27800	27800	25020	25020	25020	24940	24940	24940
			IPM(FEED)	8	6	10	8	8	7	9	9	8	8	8	11	11	11
			Ap	.0019	.0012	.0062	.0025	.0015	.0015	.0094	.0066	.0037	.0037	.0037	.0125	.0087	.0087
	9	Low alloy steel	SFM(Vc)	135	120	200	180	180	160	225	225	200	200	200	250	250	250
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	21260	18900	24380	21950	21950	19510	18140	18140	16330	16330	16330	15310	15310	15310
			IPM(FEED)	4	3	4	4	4	3	4	4	3	3	3	5	5	5
			Ap	.0015	.0009	.0046	.0019	.0012	.0012	.0070	.0049	.0028	.0028	.0028	.0094	.0066	.0066
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	205	180	300	270	270	240	340	340	305	305	305	410	410	410
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	32240	28660	36980	33280	33280	29590	27800	27800	25020	25020	25020	24940	24940	24940
			IPM(FEED)	8	6	10	8	8	7	9	9	8	8	8	11	11	11
			Ap	.0019	.0012	.0062	.0025	.0015	.0015	.0094	.0066	.0037	.0037	.0037	.0125	.0087	.0087
	11.2		SFM(Vc)	135	120	200	180	180	160	225	225	200	200	200	250	250	250
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	21260	18900	24380	21950	21950	19510	18140	18140	16330	16330	16330	15310	15310	15310
			IPM(FEED)	4	3	4	4	4	3	4	4	3	3	3	5	5	5
			Ap	.0015	.0009	.0046	.0019	.0012	.0012	.0070	.0049	.0028	.0028	.0028	.0094	.0066	.0066
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	205	180	300	270	270	240	340	340	305	305	305	410	410	410
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	32240	28660	36980	33280	33280	29590	27800	27800	25020	25020	25020	24940	24940	24940
			IPM(FEED)	8	6	10	8	8	7	9	9	8	8	8	11	11	11
			Ap	.0019	.0012	.0062	.0025	.0015	.0015	.0094	.0066	.0037	.0037	.0037	.0125	.0087	.0087
H	38.1-38.2	Hardened steel	SFM(Vc)	80	70	120	110	110	95	135	135	120	120	120	160	160	160
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	12840	11420	14730	13260	13260	11790	11090	11090	9980	9980	9980	9640	9640	9640
			IPM(FEED)	2	2	3	2	2	2	2	2	2	2	2	3	3	3
			Ap	.0011	.0007	.0037	.0015	.0009	.0009	.0056	.0039	.0022	.0022	.0022	.0075	.0052	.0052
	40	Chilled Cast Iron	SFM(Vc)	135	120	200	180	180	160	225	225	200	200	200	250	250	250
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	21260	18900	24380	21950	21950	19510	18140	18140	16330	16330	16330	15310	15310	15310
			IPM(FEED)	4	3	4	4	4	3	4	4	3	3	3	5	5	5
			Ap	.0015	.0009	.0046	.0019	.0012	.0012	.0070	.0049	.0028	.0028	.0028	.0094	.0066	.0066
	41	Hardened Cast Iron	SFM(Vc)	80	70	120	110	110	95	135	135	120	120	120	160	160	160
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	12840	11420	14730	13260	13260	11790	11090	11090	9980	9980	9980	9640	9640	9640
			IPM(FEED)	2	2	3	2	2	2	2	2	2	2	2	3	3	3
			Ap	.0011	.0007	.0037	.0015	.0009	.0009	.0056	.0039	.0022	.0022	.0022	.0075	.0052	.0052

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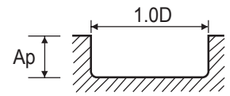

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF19 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				1/16	1/16	5/64	5/64	5/64	5/64	5/64	5/64	1/8	1/8	1/8	1/8	1/8	1/8
			LBS	3/8	1/2	1/4	5/16	3/8	1/2	9/16	5/8	5/16	3/8	1/2	5/8	3/4	1
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	365	365	445	445	445	400	400	400	490	490	490	490	440	440
			IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	22450	22450	21770	21770	21770	19590	19590	19590	15020	15020	15020	15020	13520	13520
			IPM(FEED)	9	9	12	12	12	10	10	10	12	12	12	12	10	10
			Ap	.0050	.0050	.0109	.0109	.0109	.0063	.0063	.0063	.0250	.0250	.0175	.0175	.0100	.0100
	9	Low alloy steel	SFM(Vc)	225	225	285	285	285	255	255	255	320	320	320	320	285	285
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	13780	13780	13910	13910	13910	12520	12520	12520	9730	9730	9730	9730	8760	8760
			IPM(FEED)	4	4	6	6	6	5	5	5	6	6	6	6	5	5
			Ap	.0037	.0037	.0082	.0082	.0082	.0047	.0047	.0047	.0187	.0187	.0131	.0131	.0075	.0075
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	365	365	445	445	445	400	400	400	490	490	490	490	440	440
			IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	22450	22450	21770	21770	21770	19590	19590	19590	15020	15020	15020	15020	13520	13520
			IPM(FEED)	9	9	12	12	12	10	10	10	12	12	12	12	10	10
			Ap	.0050	.0050	.0109	.0109	.0109	.0063	.0063	.0063	.0250	.0250	.0175	.0175	.0100	.0100
	11.2		SFM(Vc)	225	225	285	285	285	255	255	255	320	320	320	320	285	285
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	13780	13780	13910	13910	13910	12520	12520	12520	9730	9730	9730	9730	8760	8760
			IPM(FEED)	4	4	6	6	6	5	5	5	6	6	6	6	5	5
			Ap	.0037	.0037	.0082	.0082	.0082	.0047	.0047	.0047	.0187	.0187	.0131	.0131	.0075	.0075
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	365	365	445	445	445	400	400	400	490	490	490	490	440	440
			IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	22450	22450	21770	21770	21770	19590	19590	19590	15020	15020	15020	15020	13520	13520
			IPM(FEED)	9	9	12	12	12	10	10	10	12	12	12	12	10	10
			Ap	.0050	.0050	.0109	.0109	.0109	.0063	.0063	.0063	.0250	.0250	.0175	.0175	.0100	.0100
H	38.1-38.2	Hardened steel	SFM(Vc)	140	140	180	180	180	160	160	160	195	195	195	195	175	175
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	8670	8670	8710	8710	8710	7840	7840	7840	5950	5950	5950	5950	5360	5360
			IPM(FEED)	2	2	3	3	3	3	3	3	3	3	3	3	2	2
			Ap	.0030	.0030	.0066	.0066	.0066	.0037	.0037	.0037	.0150	.0150	.0105	.0105	.0060	.0060
	40	Chilled Cast Iron	SFM(Vc)	225	225	285	285	285	255	255	255	320	320	320	320	285	285
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	13780	13780	13910	13910	13910	12520	12520	12520	9730	9730	9730	9730	8760	8760
			IPM(FEED)	4	4	6	6	6	5	5	5	6	6	6	6	5	5
			Ap	.0037	.0037	.0082	.0082	.0082	.0047	.0047	.0047	.0187	.0187	.0131	.0131	.0075	.0075
	41	Hardened Cast Iron	SFM(Vc)	140	140	180	180	180	160	160	160	195	195	195	195	175	175
			IPT(fz)	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	8670	8670	8710	8710	8710	7840	7840	7840	5950	5950	5950	5950	5360	5360
			IPM(FEED)	2	2	3	3	3	3	3	3	3	3	3	3	2	2
			Ap	.0030	.0030	.0066	.0066	.0066	.0037	.0037	.0037	.0150	.0150	.0105	.0105	.0060	.0060

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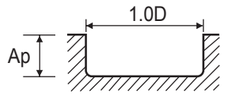
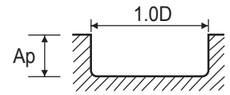


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF19 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				3/16	3/16	3/16	3/16	3/16	3/16	1/4	1/4	5/16	3/8	1/2	5/8	3/4	
			LBS	3/8	1/2	5/8	3/4	1	1-3/16	3/4	1-3/16	1	1-3/16	1-1/4	1-3/8	1-1/2	
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	565	565	565	565	510	510	590	590	595	620	620	615	620	
			IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0012	.0012	.0017	.0021	.0020	.0024	.0022	
			RPM	11550	11550	11550	11550	10390	10390	8980	8980	7260	6300	4720	3750	3150	
			IPM(FEED)	21	21	21	21	17	17	22	22	25	26	19	18	14	
			Ap	.0375	.0375	.0263	.0263	.0150	.0150	.0500	.0350	.0437	.0525	.1000	.1250	.1500	
	9	Low alloy steel	SFM(Vc)	360	360	360	360	325	325	370	370	375	410	415	415	400	
			IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0013	.0015	.0016	.0016	.0014	
			RPM	7350	7350	7350	7350	6610	6610	5670	5670	4590	4200	3160	2540	2050	
			IPM(FEED)	10	10	10	10	8	8	11	11	12	12	10	8	6	
			Ap	.0281	.0281	.0197	.0197	.0113	.0113	.0375	.0263	.0328	.0394	.0750	.0937	.1125	
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	565	565	565	565	510	510	590	590	595	620	620	615	620	
			IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0012	.0012	.0017	.0021	.0020	.0024	.0022	
			RPM	11550	11550	11550	11550	10390	10390	8980	8980	7260	6300	4720	3750	3150	
			IPM(FEED)	21	21	21	21	17	17	22	22	25	26	19	18	14	
			Ap	.0375	.0375	.0263	.0263	.0150	.0150	.0500	.0350	.0437	.0525	.1000	.1250	.1500	
	11.2		SFM(Vc)	360	360	360	360	325	325	370	370	375	410	415	415	400	
			IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0013	.0015	.0016	.0016	.0014	
			RPM	7350	7350	7350	7350	6610	6610	5670	5670	4590	4200	3160	2540	2050	
			IPM(FEED)	10	10	10	10	8	8	11	11	12	12	10	8	6	
			Ap	.0281	.0281	.0197	.0197	.0113	.0113	.0375	.0263	.0328	.0394	.0750	.0937	.1125	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	565	565	565	565	510	510	590	590	595	620	620	615	620	
			IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0012	.0012	.0017	.0021	.0020	.0024	.0022	
			RPM	11550	11550	11550	11550	10390	10390	8980	8980	7260	6300	4720	3750	3150	
			IPM(FEED)	21	21	21	21	17	17	22	22	25	26	19	18	14	
			Ap	.0375	.0375	.0263	.0263	.0150	.0150	.0500	.0350	.0437	.0525	.1000	.1250	.1500	
H	38.1-38.2	Hardened steel	SFM(Vc)	235	235	235	235	210	210	245	245	250	250	245	255	245	
			IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0007	.0007	.0009	.0011	.0012	.0012	.0012	
			RPM	4790	4790	4790	4790	4310	4310	3710	3710	3040	2540	1890	1550	1260	
			IPM(FEED)	5	5	5	5	4	4	5	5	6	6	5	4	3	
			Ap	.0225	.0225	.0157	.0157	.0090	.0090	.0300	.0210	.0263	.0315	.0600	.0750	.0900	
	40	Chilled Cast Iron	SFM(Vc)	360	360	360	360	325	325	370	370	375	410	415	415	400	
			IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0010	.0010	.0013	.0015	.0016	.0016	.0014	
			RPM	7350	7350	7350	7350	6610	6610	5670	5670	4590	4200	3160	2540	2050	
			IPM(FEED)	10	10	10	10	8	8	11	11	12	12	10	8	6	
			Ap	.0281	.0281	.0197	.0197	.0113	.0113	.0375	.0263	.0328	.0394	.0750	.0937	.1125	
	41	Hardened Cast Iron	SFM(Vc)	235	235	235	235	210	210	245	245	250	250	245	255	245	
			IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0005	.0007	.0007	.0009	.0011	.0012	.0012	.0012	
			RPM	4790	4790	4790	4790	4310	4310	3710	3710	3040	2540	1890	1550	1260	
			IPM(FEED)	5	5	5	5	4	4	5	5	6	6	5	4	3	
			Ap	.0225	.0225	.0157	.0157	.0090	.0090	.0300	.0210	.0263	.0315	.0600	.0750	.0900	



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

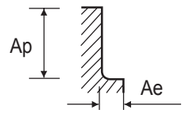
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF20 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/64	5/64	1/8	3/16	13/64	1/4	5/16	3/8	1/2	5/8	3/4
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.0D	SFM(Vc)	305	370	410	460	475	490	490	520	510	505	510
					IPT(fz)	.0001	.0002	.0003	.0004	.0005	.0005	.0008	.0009	.0009	.0009	.0009
					RPM	25000	18100	12500	9400	8900	7500	6000	5300	3900	3100	2600
					IPM(FEED)	12	13	13	16	16	16	18	19	13	11	10
	9	Low alloy steel	0.05D	2.0D	SFM(Vc)	195	240	265	295	300	310	315	340	345	345	340
					IPT(fz)	.0001	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0011	.0011	.0011
					RPM	15870	11650	8090	5960	5620	4760	3830	3440	2630	2120	1720
					IPM(FEED)	9	10	10	12	14	13	14	15	12	9	8
	10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	305	370	410	460	475	490	490	520	510	505	510
					IPT(fz)	.0001	.0002	.0003	.0004	.0005	.0005	.0008	.0009	.0009	.0009	.0009
					RPM	25000	18100	12500	9400	8900	7500	6000	5300	3900	3100	2600
					IPM(FEED)	12	13	13	16	16	16	18	19	13	11	10
	11.2		0.05D	2.0D	SFM(Vc)	195	240	265	295	300	310	315	340	345	345	340
					IPT(fz)	.0001	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0011	.0011	.0011
					RPM	15870	11650	8090	5960	5620	4760	3830	3440	2630	2120	1720
					IPM(FEED)	9	10	10	12	14	13	14	15	12	9	8
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.0D	SFM(Vc)	305	370	410	460	475	490	490	520	510	505	510
					IPT(fz)	.0001	.0002	.0003	.0004	.0005	.0005	.0008	.0009	.0009	.0009	.0009
					RPM	25000	18100	12500	9400	8900	7500	6000	5300	3900	3100	2600
					IPM(FEED)	12	13	13	16	16	16	18	19	13	11	10
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	120	150	165	190	195	205	210	210	210	210	205
					IPT(fz)	.0001	.0002	.0002	.0004	.0004	.0005	.0007	.0008	.0008	.0009	.0009
					RPM	9830	7260	4990	3830	3680	3100	2540	2120	1590	1290	1050
					IPM(FEED)	5	5	5	6	7	6	7	7	5	5	4
	40	Chilled Cast Iron	0.05D	2.0D	SFM(Vc)	195	240	265	295	300	310	315	340	345	345	340
					IPT(fz)	.0001	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0011	.0011	.0011
					RPM	15870	11650	8090	5960	5620	4760	3830	3440	2630	2120	1720
					IPM(FEED)	9	10	10	12	14	13	14	15	12	9	8
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	120	150	165	190	195	205	210	210	210	210	205
					IPT(fz)	.0001	.0002	.0002	.0004	.0004	.0005	.0007	.0008	.0008	.0009	.0009
					RPM	9830	7260	4990	3830	3680	3100	2540	2120	1590	1290	1050
					IPM(FEED)	5	5	5	6	7	6	7	7	5	5	4



* 1.5XD Axial cutting depth should be for DIA over 5/8 inch

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF21 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 3/64	3/64	3/64	1/16	1/16	1/16	1/16	5/64	5/64	5/64	5/64	1/8	1/8	1/8
			LBS	5/32	1/4	5/16	1/4	5/16	3/8	1/2	1/4	5/16	3/8	1/2	5/16	3/8	1/2
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	370	330	330	410	410	365	365	445	445	445	400	490	490	490
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	29980	26990	26990	24940	24940	22450	22450	21770	21770	21770	19590	15020	15020	15020
			IPM(FEED)	15	12	12	14	14	11	11	15	15	15	12	15	15	15
			Ae	.0010	.0006	.0006	.0013	.0013	.0007	.0007	.0017	.0017	.0017	.0009	.0037	.0037	.0026
	9	Low alloy steel	SFM(Vc)	235	210	210	250	250	225	225	285	285	285	255	320	320	320
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0003	.0003	.0003
			RPM	19050	17140	17140	15310	15310	13780	13780	13910	13910	13910	12520	9730	9730	9730
			IPM(FEED)	10	9	9	10	10	8	8	11	11	11	9	12	12	12
			Ae	.0007	.0004	.0004	.0010	.0010	.0006	.0006	.0012	.0012	.0012	.0007	.0028	.0028	.0020
	10	High alloyed steel, and tool steel	SFM(Vc)	370	330	330	410	410	365	365	445	445	445	400	490	490	490
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	29980	26990	26990	24940	24940	22450	22450	21770	21770	21770	19590	15020	15020	15020
			IPM(FEED)	15	12	12	14	14	11	11	15	15	15	12	15	15	15
			Ae	.0010	.0006	.0006	.0013	.0013	.0007	.0007	.0017	.0017	.0017	.0009	.0037	.0037	.0026
	11.1-11.2		SFM(Vc)	235	210	210	250	250	225	225	285	285	285	255	320	320	320
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0003	.0003	.0003
			RPM	19050	17140	17140	15310	15310	13780	13780	13910	13910	13910	12520	9730	9730	9730
			IPM(FEED)	10	9	9	10	10	8	8	11	11	11	9	12	12	12
			Ae	.0007	.0004	.0004	.0010	.0010	.0006	.0006	.0012	.0012	.0012	.0007	.0028	.0028	.0020
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	370	330	330	410	410	365	365	445	445	445	400	490	490	490
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	29980	26990	26990	24940	24940	22450	22450	21770	21770	21770	19590	15020	15020	15020
			IPM(FEED)	15	12	12	14	14	11	11	15	15	15	12	15	15	15
			Ae	.0010	.0006	.0006	.0013	.0013	.0007	.0007	.0017	.0017	.0017	.0009	.0037	.0037	.0026
H	38.1-38.2	Hardened steel	SFM(Vc)	145	130	130	160	160	140	140	180	180	180	160	195	195	195
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0001	.0002	.0002	.0002
			RPM	11790	10610	10610	9640	9640	8670	8670	8710	8710	8710	7840	5950	5950	5950
			IPM(FEED)	6	5	5	5	5	4	4	6	6	6	5	6	6	6
			Ae	.0006	.0004	.0004	.0008	.0008	.0004	.0004	.0010	.0010	.0010	.0006	.0022	.0022	.0016
	40	Chilled Cast Iron	SFM(Vc)	235	210	210	250	250	225	225	285	285	285	255	320	320	320
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0003	.0003	.0003
			RPM	19050	17140	17140	15310	15310	13780	13780	13910	13910	13910	12520	9730	9730	9730
			IPM(FEED)	10	9	9	10	10	8	8	11	11	11	9	12	12	12
			Ae	.0007	.0004	.0004	.0010	.0010	.0006	.0006	.0012	.0012	.0012	.0007	.0028	.0028	.0020
	41	Hardened Cast Iron	SFM(Vc)	145	130	130	160	160	140	140	180	180	180	160	195	195	195
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0001	.0002	.0002	.0002
			RPM	11790	10610	10610	9640	9640	8670	8670	8710	8710	8710	7840	5950	5950	5950
			IPM(FEED)	6	5	5	5	5	4	4	6	6	6	5	6	6	6
			Ae	.0006	.0004	.0004	.0008	.0008	.0004	.0004	.0010	.0010	.0010	.0006	.0022	.0022	.0016

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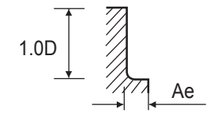
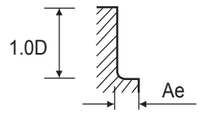


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF21 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	1/4	5/16	5/16	3/8	3/8	1/2	1/2	5/8	3/4
				LBS	5/8	3/4	1	3/8	1/2	5/8	3/4	1	3/4	1	1-3/8	1-3/16	1-1/2	1-1/4	1-3/4	1-3/8	1-1/2
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	490	440	440	565	565	565	565	510	590	595	595	620	620	620	620	615	620
			IPT(fz)	.0002	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0005	.0008	.0008	.0009	.0009	.0008	.0008	.0009	.0009
			RPM	15020	13520	13520	11550	11550	11550	11550	10390	8980	7260	7260	6300	6300	4720	4720	3750	3150
			IPM(FEED)	15	12	12	21	21	21	21	17	19	22	22	23	23	16	16	13	11
			Ae	.0026	.0015	.0015	.0056	.0056	.0039	.0039	.0022	.0075	.0066	.0066	.0079	.0079	.0150	.0105	.0187	.0225
	9	Low alloy steel	SFM(Vc)	320	285	285	360	360	360	360	325	370	375	375	410	410	415	415	415	400
			IPT(fz)	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0007	.0009	.0009	.0011	.0011	.0011	.0011	.0011	.0011
			RPM	9730	8760	8760	7350	7350	7350	7350	6610	5670	4590	4590	4200	4200	3160	3160	2540	2050
			IPM(FEED)	12	9	9	18	18	18	18	14	16	17	17	18	18	14	14	11	9
			Ae	.0020	.0011	.0011	.0042	.0042	.0030	.0030	.0017	.0056	.0049	.0049	.0059	.0059	.0113	.0079	.0141	.0169
	10	High alloyed steel, and tool steel	SFM(Vc)	490	440	440	565	565	565	565	510	590	595	595	620	620	620	620	615	620
			IPT(fz)	.0002	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0005	.0008	.0008	.0009	.0009	.0008	.0008	.0009	.0009
			RPM	15020	13520	13520	11550	11550	11550	11550	10390	8980	7260	7260	6300	6300	4720	4720	3750	3150
			IPM(FEED)	15	12	12	21	21	21	21	17	19	22	22	23	23	16	16	13	11
			Ae	.0026	.0015	.0015	.0056	.0056	.0039	.0039	.0022	.0075	.0066	.0066	.0079	.0079	.0150	.0105	.0187	.0225
	11.1-11.2		SFM(Vc)	320	285	285	360	360	360	360	325	370	375	375	410	410	415	415	415	400
			IPT(fz)	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0007	.0009	.0009	.0011	.0011	.0011	.0011	.0011	.0011
			RPM	9730	8760	8760	7350	7350	7350	7350	6610	5670	4590	4590	4200	4200	3160	3160	2540	2050
			IPM(FEED)	12	9	9	18	18	18	18	14	16	17	17	18	18	14	14	11	9
			Ae	.0020	.0011	.0011	.0042	.0042	.0030	.0030	.0017	.0056	.0049	.0049	.0059	.0059	.0113	.0079	.0141	.0169
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	490	440	440	565	565	565	565	510	590	595	595	620	620	620	620	615	620
			IPT(fz)	.0002	.0002	.0002	.0005	.0005	.0005	.0005	.0004	.0005	.0008	.0008	.0009	.0009	.0008	.0008	.0009	.0009
			RPM	15020	13520	13520	11550	11550	11550	11550	10390	8980	7260	7260	6300	6300	4720	4720	3750	3150
			IPM(FEED)	15	12	12	21	21	21	21	17	19	22	22	23	23	16	16	13	11
			Ae	.0026	.0015	.0015	.0056	.0056	.0039	.0039	.0022	.0075	.0066	.0066	.0079	.0079	.0150	.0105	.0187	.0225
H	38.1-38.2	Hardened steel	SFM(Vc)	195	175	175	235	235	235	235	210	245	250	250	250	250	245	245	255	245
			IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0005	.0006	.0006	.0008	.0008	.0008	.0008	.0009	.0008
			RPM	5950	5360	5360	4790	4790	4790	4790	4310	3710	3040	3040	2540	2540	1890	1890	1550	1260
			IPM(FEED)	6	5	5	8	8	8	8	7	8	8	8	8	8	6	6	5	4
			Ae	.0016	.0009	.0009	.0034	.0034	.0024	.0024	.0013	.0045	.0039	.0039	.0047	.0047	.0090	.0063	.0113	.0135
	40	Chilled Cast Iron	SFM(Vc)	320	285	285	360	360	360	360	325	370	375	375	410	410	415	415	415	400
			IPT(fz)	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0007	.0009	.0009	.0011	.0011	.0011	.0011	.0011	.0011
			RPM	9730	8760	8760	7350	7350	7350	7350	6610	5670	4590	4590	4200	4200	3160	3160	2540	2050
			IPM(FEED)	12	9	9	18	18	18	18	14	16	17	17	18	18	14	14	11	9
			Ae	.0020	.0011	.0011	.0042	.0042	.0030	.0030	.0017	.0056	.0049	.0049	.0059	.0059	.0113	.0079	.0141	.0169
	41	Hardened Cast Iron	SFM(Vc)	195	175	175	235	235	235	235	210	245	250	250	250	250	245	245	255	245
			IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0005	.0006	.0006	.0008	.0008	.0008	.0008	.0009	.0008
			RPM	5950	5360	5360	4790	4790	4790	4790	4310	3710	3040	3040	2540	2540	1890	1890	1550	1260
			IPM(FEED)	6	5	5	8	8	8	8	7	8	8	8	8	8	6	6	5	4
			Ae	.0016	.0009	.0009	.0034	.0034	.0024	.0024	.0013	.0045	.0039	.0039	.0047	.0047	.0090	.0063	.0113	.0135



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF22 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				.008	.015	.015	.015	.015	.015	.020	.020	.020	.020	.020	.024	.024	.024
			LBS	3/64	3/64	3/64	1/8	5/32	3/16	5/64	1/8	5/32	3/16	1/4	5/64	1/8	5/32
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	70	105	95	95	85	85	140	125	125	125	115	170	150	150
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0006	.0005	.0005
			RPM	34100	26930	24240	24240	21540	21540	26970	24270	24270	24270	21570	26970	24270	24270
			IPM(FEED)	12	12	10	10	8	8	21	17	17	17	13	30	24	24
			Ap	.0003	.0009	.0006	.0004	.0004	.0004	.0013	.0007	.0007	.0004	.0004	.0015	.0009	.0009
	9	Low alloy steel	SFM(Vc)	65	100	90	90	80	80	135	120	120	120	105	160	145	145
			IPT(fz)	.0001	.0002	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004
			RPM	32160	25430	22890	22890	20350	20350	25390	22850	22850	22850	20310	25390	22850	22850
			IPM(FEED)	9	9	7	7	5	5	17	13	13	13	11	21	17	17
			Ap	.0002	.0007	.0004	.0003	.0003	.0003	.0010	.0006	.0006	.0004	.0004	.0012	.0007	.0007
	10	High alloyed steel, and tool steel	SFM(Vc)	70	105	95	95	85	85	140	125	125	125	115	170	150	150
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0006	.0005	.0005
			RPM	34100	26930	24240	24240	21540	21540	26970	24270	24270	24270	21570	26970	24270	24270
			IPM(FEED)	12	12	10	10	8	8	21	17	17	17	13	30	24	24
			Ap	.0003	.0009	.0006	.0004	.0004	.0004	.0013	.0007	.0007	.0004	.0004	.0015	.0009	.0009
	11.1-11.2		SFM(Vc)	65	100	90	90	80	80	135	120	120	120	105	160	145	145
			IPT(fz)	.0001	.0002	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004
			RPM	32160	25430	22890	22890	20350	20350	25390	22850	22850	22850	20310	25390	22850	22850
			IPM(FEED)	9	9	7	7	5	5	17	13	13	13	11	21	17	17
			Ap	.0002	.0007	.0004	.0003	.0003	.0003	.0010	.0006	.0006	.0004	.0004	.0012	.0007	.0007
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	70	105	95	95	85	85	140	125	125	125	115	170	150	150
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003	.0003	.0003	.0006	.0005	.0005
			RPM	34100	26930	24240	24240	21540	21540	26970	24270	24270	24270	21570	26970	24270	24270
			IPM(FEED)	12	12	10	10	8	8	21	17	17	17	13	30	24	24
			Ap	.0003	.0009	.0006	.0004	.0004	.0004	.0013	.0007	.0007	.0004	.0004	.0015	.0009	.0009
H	38.1-38.2	Hardened steel	SFM(Vc)	60	90	80	80	70	70	115	105	105	105	95	140	125	125
			IPT(fz)	.0001	.0002	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003
			RPM	28440	22440	20200	20200	17950	17950	22440	20200	20200	20200	17950	22440	20200	20200
			IPM(FEED)	6	7	6	6	5	5	11	9	9	9	7	16	13	13
			Ap	.0002	.0005	.0003	.0002	.0002	.0002	.0007	.0004	.0004	.0002	.0002	.0008	.0005	.0005
	40	Chilled Cast Iron	SFM(Vc)	65	100	90	90	80	80	135	120	120	120	105	160	145	145
			IPT(fz)	.0001	.0002	.0001	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004
			RPM	32160	25430	22890	22890	20350	20350	25390	22850	22850	22850	20310	25390	22850	22850
			IPM(FEED)	9	9	7	7	5	5	17	13	13	13	11	21	17	17
			Ap	.0002	.0007	.0004	.0003	.0003	.0003	.0010	.0006	.0006	.0004	.0004	.0012	.0007	.0007
	41	Hardened Cast Iron	SFM(Vc)	60	90	80	80	70	70	115	105	105	105	95	140	125	125
			IPT(fz)	.0001	.0002	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0004	.0003	.0003
			RPM	28440	22440	20200	20200	17950	17950	22440	20200	20200	20200	17950	22440	20200	20200
			IPM(FEED)	6	7	6	6	5	5	11	9	9	9	7	16	13	13
			Ap	.0002	.0005	.0003	.0002	.0002	.0002	.0007	.0004	.0004	.0002	.0002	.0008	.0005	.0005

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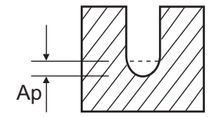
(Depth of Cut per one pass)



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF22 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				.024	.024	.024	.024	1/32	1/32	1/32	1/32	1/32	1/32	1/32	3/64	3/64	3/64
			LBS	3/16	1/4	5/16	3/8	5/64	1/8	5/32	3/16	1/4	5/16	3/8	1/8	5/32	3/16
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	150	135	135	100	225	225	225	205	205	205	180	270	270	270
			IPT(fz)	.0005	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0008	.0008	.0008
			RPM	24270	21570	21570	16180	27620	27620	27620	24850	24850	24850	22090	22070	22070	22070
			IPM(FEED)	24	19	19	13	31	31	31	25	25	25	20	37	37	37
			Ap	.0009	.0006	.0003	.0003	.0028	.0020	.0020	.0011	.0011	.0007	.0007	.0042	.0030	.0030
	9	Low alloy steel	SFM(Vc)	145	130	130	95	215	215	215	190	190	190	170	255	255	255
			IPT(fz)	.0004	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0007	.0007	.0007
			RPM	22850	20310	20310	15240	26000	26000	26000	23400	23400	23400	20800	20860	20860	20860
			IPM(FEED)	17	14	14	9	24	24	24	20	20	20	15	29	29	29
			Ap	.0007	.0004	.0002	.0002	.0022	.0015	.0015	.0009	.0009	.0006	.0006	.0033	.0023	.0023
	10	High alloyed steel, and tool steel	SFM(Vc)	150	135	135	100	225	225	225	205	205	205	180	270	270	270
			IPT(fz)	.0005	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0008	.0008	.0008
			RPM	24270	21570	21570	16180	27620	27620	27620	24850	24850	24850	22090	22070	22070	22070
			IPM(FEED)	24	19	19	13	31	31	31	25	25	25	20	37	37	37
			Ap	.0009	.0006	.0003	.0003	.0028	.0020	.0020	.0011	.0011	.0007	.0007	.0042	.0030	.0030
	11.1-11.2		SFM(Vc)	145	130	130	95	215	215	215	190	190	190	170	255	255	255
			IPT(fz)	.0004	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0007	.0007	.0007
			RPM	22850	20310	20310	15240	26000	26000	26000	23400	23400	23400	20800	20860	20860	20860
			IPM(FEED)	17	14	14	9	24	24	24	20	20	20	15	29	29	29
			Ap	.0007	.0004	.0002	.0002	.0022	.0015	.0015	.0009	.0009	.0006	.0006	.0033	.0023	.0023
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	150	135	135	100	225	225	225	205	205	205	180	270	270	270
			IPT(fz)	.0005	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0008	.0008	.0008
			RPM	24270	21570	21570	16180	27620	27620	27620	24850	24850	24850	22090	22070	22070	22070
			IPM(FEED)	24	19	19	13	31	31	31	25	25	25	20	37	37	37
			Ap	.0009	.0006	.0003	.0003	.0028	.0020	.0020	.0011	.0011	.0007	.0007	.0042	.0030	.0030
H	38.1-38.2	Hardened steel	SFM(Vc)	125	115	115	85	190	190	190	170	170	170	150	225	225	225
			IPT(fz)	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0005	.0005	.0005
			RPM	20200	17950	17950	13460	22980	22980	22980	20680	20680	20680	18380	18340	18340	18340
			IPM(FEED)	13	10	10	7	18	18	18	14	14	14	11	19	19	19
			Ap	.0005	.0003	.0002	.0002	.0016	.0011	.0011	.0006	.0006	.0004	.0004	.0024	.0017	.0017
	40	Chilled Cast Iron	SFM(Vc)	145	130	130	95	215	215	215	190	190	190	170	255	255	255
			IPT(fz)	.0004	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0007	.0007	.0007
			RPM	22850	20310	20310	15240	26000	26000	26000	23400	23400	23400	20800	20860	20860	20860
			IPM(FEED)	17	14	14	9	24	24	24	20	20	20	15	29	29	29
			Ap	.0007	.0004	.0002	.0002	.0022	.0015	.0015	.0009	.0009	.0006	.0006	.0033	.0023	.0023
	41	Hardened Cast Iron	SFM(Vc)	125	115	115	85	190	190	190	170	170	170	150	225	225	225
			IPT(fz)	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0005	.0005	.0005
			RPM	20200	17950	17950	13460	22980	22980	22980	20680	20680	20680	18380	18340	18340	18340
			IPM(FEED)	13	10	10	7	18	18	18	14	14	14	11	19	19	19
			Ap	.0005	.0003	.0002	.0002	.0016	.0011	.0011	.0006	.0006	.0004	.0004	.0024	.0017	.0017

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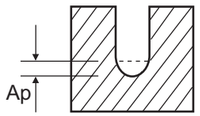
(Depth of Cut per one pass)



4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
GMF22 SERIES — 2 FLUTE SQUARE - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				3/64	3/64	3/64	3/64	3/64	3/64	3/64	1/16	1/16	1/16	1/16	1/16	1/16	1/16
			LBS	1/4	5/16	3/8	1/2	9/16	5/8	3/4	5/32	1/4	5/16	3/8	1/2	9/16	5/8
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	245	245	245	215	215	215	160	295	295	295	265	265	265	265
			IPT(fz)	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0009	.0009	.0009	.0008	.0008	.0008	.0008
			RPM	19870	19870	19870	17660	17660	17660	13240	18140	18140	18140	16330	16330	16330	16330
			IPM(FEED)	30	30	30	24	24	24	16	34	34	34	27	27	27	27
			Ap	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039	.0022	.0022	.0014	.0014
	9	Low alloy steel	SFM(Vc)	230	230	230	205	205	205	155	280	280	280	250	250	250	250
			IPT(fz)	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0007	.0007	.0007	.0006	.0006	.0006	.0006
			RPM	18780	18780	18780	16690	16690	16690	12520	17100	17100	17100	15390	15390	15390	15390
			IPM(FEED)	23	23	23	18	18	18	12	24	24	24	19	19	19	19
			Ap	.0013	.0013	.0013	.0008	.0008	.0005	.0005	.0044	.0031	.0031	.0017	.0017	.0011	.0011
	10	High alloyed steel, and tool steel	SFM(Vc)	245	245	245	215	215	215	160	295	295	295	265	265	265	265
			IPT(fz)	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0009	.0009	.0009	.0008	.0008	.0008	.0008
			RPM	19870	19870	19870	17660	17660	17660	13240	18140	18140	18140	16330	16330	16330	16330
			IPM(FEED)	30	30	30	24	24	24	16	34	34	34	27	27	27	27
			Ap	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039	.0022	.0022	.0014	.0014
	11.1-11.2		SFM(Vc)	230	230	230	205	205	205	155	280	280	280	250	250	250	250
			IPT(fz)	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0007	.0007	.0007	.0006	.0006	.0006	.0006
			RPM	18780	18780	18780	16690	16690	16690	12520	17100	17100	17100	15390	15390	15390	15390
			IPM(FEED)	23	23	23	18	18	18	12	24	24	24	19	19	19	19
			Ap	.0013	.0013	.0013	.0008	.0008	.0005	.0005	.0044	.0031	.0031	.0017	.0017	.0011	.0011
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	245	245	245	215	215	215	160	295	295	295	265	265	265	265
			IPT(fz)	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0009	.0009	.0009	.0008	.0008	.0008	.0008
			RPM	19870	19870	19870	17660	17660	17660	13240	18140	18140	18140	16330	16330	16330	16330
			IPM(FEED)	30	30	30	24	24	24	16	34	34	34	27	27	27	27
			Ap	.0017	.0017	.0017	.0011	.0011	.0006	.0006	.0056	.0039	.0039	.0022	.0022	.0014	.0014
H	38.1-38.2	Hardened steel	SFM(Vc)	205	205	205	180	180	180	135	245	245	245	225	225	225	225
			IPT(fz)	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0005	.0005
			RPM	16510	16510	16510	14670	14670	14670	11010	15120	15120	15120	13610	13610	13610	13610
			IPM(FEED)	16	16	16	12	12	12	8	18	18	18	14	14	14	14
			Ap	.0009	.0009	.0009	.0006	.0006	.0004	.0004	.0031	.0022	.0022	.0013	.0013	.0008	.0008
	40	Chilled Cast Iron	SFM(Vc)	230	230	230	205	205	205	155	280	280	280	250	250	250	250
			IPT(fz)	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0007	.0007	.0007	.0006	.0006	.0006	.0006
			RPM	18780	18780	18780	16690	16690	16690	12520	17100	17100	17100	15390	15390	15390	15390
			IPM(FEED)	23	23	23	18	18	18	12	24	24	24	19	19	19	19
			Ap	.0013	.0013	.0013	.0008	.0008	.0005	.0005	.0044	.0031	.0031	.0017	.0017	.0011	.0011
	41	Hardened Cast Iron	SFM(Vc)	205	205	205	180	180	180	135	245	245	245	225	225	225	225
			IPT(fz)	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0005	.0005
			RPM	16510	16510	16510	14670	14670	14670	11010	15120	15120	15120	13610	13610	13610	13610
			IPM(FEED)	16	16	16	12	12	12	8	18	18	18	14	14	14	14
			Ap	.0009	.0009	.0009	.0006	.0006	.0004	.0004	.0031	.0022	.0022	.0013	.0013	.0008	.0008

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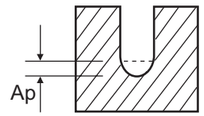
(Depth of Cut per one pass)



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF22 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				1/16	5/64	5/64	5/64	5/64	5/64	5/64	5/64	3/32	3/32	3/32	3/32	1/8	1/8
			LBS	3/4	1/4	5/16	3/8	1/2	9/16	5/8	3/4	5/16	1/2	5/8	3/4	5/16	3/8
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	235	295	295	295	265	265	265	265	315	285	285	285	335	335
			IPT(fz)	.0007	.0011	.0011	.0011	.0010	.0010	.0010	.0010	.0016	.0014	.0014	.0014	.0016	.0016
			RPM	14510	14510	14510	14510	13060	13060	13060	13060	12910	11620	11620	11620	10300	10300
			IPM(FEED)	22	33	33	33	26	26	26	26	40	33	33	33	32	32
			Ap	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0059	.0034	.0034	.0034	.0113	.0113
	9	Low alloy steel	SFM(Vc)	225	280	280	280	250	250	250	250	300	270	270	270	320	320
			IPT(fz)	.0006	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0012	.0010	.0010	.0010	.0012	.0012
			RPM	13680	13710	13710	13710	12340	12340	12340	12340	12180	10960	10960	10960	9730	9730
			IPM(FEED)	15	25	25	25	20	20	20	20	28	23	23	23	22	22
			Ap	.0011	.0038	.0038	.0038	.0022	.0022	.0022	.0014	.0046	.0026	.0026	.0026	.0087	.0087
	10	High alloyed steel, and tool steel	SFM(Vc)	235	295	295	295	265	265	265	265	315	285	285	285	335	335
			IPT(fz)	.0007	.0011	.0011	.0011	.0010	.0010	.0010	.0010	.0016	.0014	.0014	.0014	.0016	.0016
			RPM	14510	14510	14510	14510	13060	13060	13060	13060	12910	11620	11620	11620	10300	10300
			IPM(FEED)	22	33	33	33	26	26	26	26	40	33	33	33	32	32
			Ap	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0059	.0034	.0034	.0034	.0113	.0113
	11.1-11.2		SFM(Vc)	225	280	280	280	250	250	250	250	300	270	270	270	320	320
			IPT(fz)	.0006	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0012	.0010	.0010	.0010	.0012	.0012
			RPM	13680	13710	13710	13710	12340	12340	12340	12340	12180	10960	10960	10960	9730	9730
			IPM(FEED)	15	25	25	25	20	20	20	20	28	23	23	23	22	22
			Ap	.0011	.0038	.0038	.0038	.0022	.0022	.0022	.0014	.0046	.0026	.0026	.0026	.0087	.0087
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	235	295	295	295	265	265	265	265	315	285	285	285	335	335
			IPT(fz)	.0007	.0011	.0011	.0011	.0010	.0010	.0010	.0010	.0016	.0014	.0014	.0014	.0016	.0016
			RPM	14510	14510	14510	14510	13060	13060	13060	13060	12910	11620	11620	11620	10300	10300
			IPM(FEED)	22	33	33	33	26	26	26	26	40	33	33	33	32	32
			Ap	.0014	.0049	.0049	.0049	.0028	.0028	.0028	.0018	.0059	.0034	.0034	.0034	.0113	.0113
H	38.1-38.2	Hardened steel	SFM(Vc)	200	245	245	245	225	225	225	225	265	240	240	240	205	205
			IPT(fz)	.0005	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0010	.0009	.0009	.0009	.0013	.0013
			RPM	12090	12090	12090	12090	10890	10890	10890	10890	10810	9730	9730	9730	6240	6240
			IPM(FEED)	11	19	19	19	15	15	15	15	21	17	17	17	17	17
			Ap	.0008	.0027	.0027	.0027	.0016	.0016	.0016	.0010	.0033	.0019	.0019	.0019	.0063	.0063
	40	Chilled Cast Iron	SFM(Vc)	225	280	280	280	250	250	250	250	300	270	270	270	320	320
			IPT(fz)	.0006	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0012	.0010	.0010	.0010	.0012	.0012
			RPM	13680	13710	13710	13710	12340	12340	12340	12340	12180	10960	10960	10960	9730	9730
			IPM(FEED)	15	25	25	25	20	20	20	20	28	23	23	23	22	22
			Ap	.0011	.0038	.0038	.0038	.0022	.0022	.0022	.0014	.0046	.0026	.0026	.0026	.0087	.0087
	41	Hardened Cast Iron	SFM(Vc)	200	245	245	245	225	225	225	225	265	240	240	240	205	205
			IPT(fz)	.0005	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0010	.0009	.0009	.0009	.0013	.0013
			RPM	12090	12090	12090	12090	10890	10890	10890	10890	10810	9730	9730	9730	6240	6240
			IPM(FEED)	11	19	19	19	15	15	15	15	21	17	17	17	17	17
			Ap	.0008	.0027	.0027	.0027	.0016	.0016	.0016	.0010	.0033	.0019	.0019	.0019	.0063	.0063

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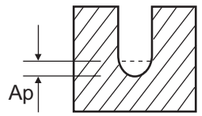
(Depth of Cut per one pass)



4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
GMF22 SERIES — 2 FLUTE SQUARE - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				1/8	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	3/16	3/16	13/64
			LBS	1/2	9/16	5/8	11/16	3/4	1	3/8	1/2	5/8	11/16	3/4	1	1-13/16	3/4
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	335	335	335	305	305	305	330	330	330	330	330	295	295	330
			IPT(fz)	.0016	.0016	.0016	.0014	.0014	.0014	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0036
			RPM	10300	10300	10300	9270	9270	9270	6720	6720	6720	6720	6720	6050	6050	6200
			IPM(FEED)	32	32	32	26	26	26	43	43	43	43	43	35	35	44
			Ap	.0079	.0079	.0079	.0045	.0045	.0045	.0169	.0169	.0118	.0118	.0118	.0067	.0067	.0128
	9	Low alloy steel	SFM(Vc)	320	320	320	285	285	285	315	315	315	315	315	280	280	315
			IPT(fz)	.0012	.0012	.0012	.0010	.0010	.0010	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0029
			RPM	9730	9730	9730	8760	8760	8760	6380	6380	6380	6380	6380	5740	5740	5910
			IPM(FEED)	22	22	22	18	18	18	38	38	38	38	38	31	31	34
			Ap	.0061	.0061	.0061	.0035	.0035	.0035	.0131	.0131	.0092	.0092	.0092	.0052	.0052	.0100
	10	High alloyed steel, and tool steel	SFM(Vc)	335	335	335	305	305	305	330	330	330	330	330	295	295	330
			IPT(fz)	.0016	.0016	.0016	.0014	.0014	.0014	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0036
			RPM	10300	10300	10300	9270	9270	9270	6720	6720	6720	6720	6720	6050	6050	6200
			IPM(FEED)	32	32	32	26	26	26	43	43	43	43	43	35	35	44
			Ap	.0079	.0079	.0079	.0045	.0045	.0045	.0169	.0169	.0118	.0118	.0118	.0067	.0067	.0128
	11.1-11.2		SFM(Vc)	320	320	320	285	285	285	315	315	315	315	315	280	280	315
			IPT(fz)	.0012	.0012	.0012	.0010	.0010	.0010	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0029
			RPM	9730	9730	9730	8760	8760	8760	6380	6380	6380	6380	6380	5740	5740	5910
			IPM(FEED)	22	22	22	18	18	18	38	38	38	38	38	31	31	34
			Ap	.0061	.0061	.0061	.0035	.0035	.0035	.0131	.0131	.0092	.0092	.0092	.0052	.0052	.0100
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	335	335	335	305	305	305	330	330	330	330	330	295	295	330
			IPT(fz)	.0016	.0016	.0016	.0014	.0014	.0014	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0036
			RPM	10300	10300	10300	9270	9270	9270	6720	6720	6720	6720	6720	6050	6050	6200
			IPM(FEED)	32	32	32	26	26	26	43	43	43	43	43	35	35	44
			Ap	.0079	.0079	.0079	.0045	.0045	.0045	.0169	.0169	.0118	.0118	.0118	.0067	.0067	.0128
H	38.1-38.2	Hardened steel	SFM(Vc)	205	205	205	185	185	185	275	275	275	275	275	250	250	280
			IPT(fz)	.0013	.0013	.0013	.0012	.0012	.0012	.0023	.0023	.0023	.0023	.0023	.0020	.0020	.0022
			RPM	6240	6240	6240	5610	5610	5610	5630	5630	5630	5630	5630	5060	5060	5230
			IPM(FEED)	17	17	17	14	14	14	25	25	25	25	25	21	21	23
			Ap	.0044	.0044	.0044	.0025	.0025	.0025	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0071
	40	Chilled Cast Iron	SFM(Vc)	320	320	320	285	285	285	315	315	315	315	315	280	280	315
			IPT(fz)	.0012	.0012	.0012	.0010	.0010	.0010	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0029
			RPM	9730	9730	9730	8760	8760	8760	6380	6380	6380	6380	6380	5740	5740	5910
			IPM(FEED)	22	22	22	18	18	18	38	38	38	38	38	31	31	34
			Ap	.0061	.0061	.0061	.0035	.0035	.0035	.0131	.0131	.0092	.0092	.0092	.0052	.0052	.0100
	41	Hardened Cast Iron	SFM(Vc)	205	205	205	185	185	185	275	275	275	275	275	250	250	280
			IPT(fz)	.0013	.0013	.0013	.0012	.0012	.0012	.0023	.0023	.0023	.0023	.0023	.0020	.0020	.0022
			RPM	6240	6240	6240	5610	5610	5610	5630	5630	5630	5630	5630	5060	5060	5230
			IPM(FEED)	17	17	17	14	14	14	25	25	25	25	25	21	21	23
			Ap	.0044	.0044	.0044	.0025	.0025	.0025	.0094	.0094	.0066	.0066	.0066	.0037	.0037	.0071

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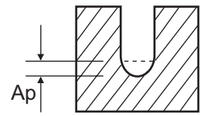
(Depth of Cut per one pass)



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

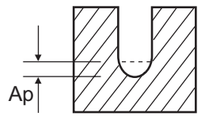
4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF22 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				13/64	13/64	13/64	13/64	1/4	1/4	1/4	5/16	3/8	3/8	1/2	1/2
			LBS	1-3/16	1-3/8	1-1/2	2	5/8	3/4	1-3/16	1	1-3/16	1-3/4	1-3/8	2
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	295	295	295	295	330	330	330	330	330	330	325	325
			IPT(fz)	.0032	.0032	.0032	.0032	.0039	.0039	.0039	.0047	.0055	.0055	.0059	.0059
			RPM	5580	5580	5580	5580	5010	5010	5010	4030	3360	3360	2500	2500
			IPM(FEED)	36	36	36	36	39	39	39	38	37	37	30	30
			Ap	.0073	.0073	.0073	.0046	.0225	.0225	.0157	.0197	.0236	.0236	.0450	.0315
	9	Low alloy steel	SFM(Vc)	285	285	285	285	310	310	310	315	315	315	310	310
			IPT(fz)	.0026	.0026	.0026	.0026	.0032	.0032	.0032	.0039	.0044	.0044	.0047	.0047
			RPM	5320	5320	5320	5320	4720	4720	4720	3830	3200	3200	2380	2380
			IPM(FEED)	28	28	28	28	31	31	31	30	28	28	22	22
			Ap	.0057	.0057	.0057	.0035	.0175	.0175	.0122	.0153	.0184	.0184	.0350	.0245
	10	High alloyed steel, and tool steel	SFM(Vc)	295	295	295	295	330	330	330	330	330	330	325	325
			IPT(fz)	.0032	.0032	.0032	.0032	.0039	.0039	.0039	.0047	.0055	.0055	.0059	.0059
			RPM	5580	5580	5580	5580	5010	5010	5010	4030	3360	3360	2500	2500
			IPM(FEED)	36	36	36	36	39	39	39	38	37	37	30	30
			Ap	.0073	.0073	.0073	.0046	.0225	.0225	.0157	.0197	.0236	.0236	.0450	.0315
	11.1-11.2		SFM(Vc)	285	285	285	285	310	310	310	315	315	315	310	310
			IPT(fz)	.0026	.0026	.0026	.0026	.0032	.0032	.0032	.0039	.0044	.0044	.0047	.0047
			RPM	5320	5320	5320	5320	4720	4720	4720	3830	3200	3200	2380	2380
			IPM(FEED)	28	28	28	28	31	31	31	30	28	28	22	22
			Ap	.0057	.0057	.0057	.0035	.0175	.0175	.0122	.0153	.0184	.0184	.0350	.0245
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	295	295	295	295	330	330	330	330	330	330	325	325
			IPT(fz)	.0032	.0032	.0032	.0032	.0039	.0039	.0039	.0047	.0055	.0055	.0059	.0059
			RPM	5580	5580	5580	5580	5010	5010	5010	4030	3360	3360	2500	2500
			IPM(FEED)	36	36	36	36	39	39	39	38	37	37	30	30
			Ap	.0073	.0073	.0073	.0046	.0225	.0225	.0157	.0197	.0236	.0236	.0450	.0315
H	38.1-38.2	Hardened steel	SFM(Vc)	250	250	250	250	270	270	270	270	270	270	270	270
			IPT(fz)	.0020	.0020	.0020	.0020	.0025	.0025	.0025	.0030	.0030	.0030	.0032	.0032
			RPM	4710	4710	4710	4710	4160	4160	4160	3330	2760	2760	2060	2060
			IPM(FEED)	19	19	19	19	21	21	21	20	17	17	13	13
			Ap	.0041	.0041	.0041	.0025	.0125	.0125	.0087	.0109	.0131	.0131	.0250	.0175
	40	Chilled Cast Iron	SFM(Vc)	285	285	285	285	310	310	310	315	315	315	310	310
			IPT(fz)	.0026	.0026	.0026	.0026	.0032	.0032	.0032	.0039	.0044	.0044	.0047	.0047
			RPM	5320	5320	5320	5320	4720	4720	4720	3830	3200	3200	2380	2380
			IPM(FEED)	28	28	28	28	31	31	31	30	28	28	22	22
			Ap	.0057	.0057	.0057	.0035	.0175	.0175	.0122	.0153	.0184	.0184	.0350	.0245
	41	Hardened Cast Iron	SFM(Vc)	250	250	250	250	270	270	270	270	270	270	270	270
			IPT(fz)	.0020	.0020	.0020	.0020	.0025	.0025	.0025	.0030	.0030	.0030	.0032	.0032
			RPM	4710	4710	4710	4710	4160	4160	4160	3330	2760	2760	2060	2060
			IPM(FEED)	19	19	19	19	21	21	21	20	17	17	13	13
			Ap	.0041	.0041	.0041	.0025	.0125	.0125	.0087	.0109	.0131	.0131	.0250	.0175

(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF23 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						.004	.008	.012	.015	.020	.024	.028	.031	.035	.040	.047
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225
					IPT(fz)	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
					RPM	41300	41300	38400	40900	35400	31500	27600	25400	23800	21200	18100
					IPM(FEED)	4	4	4	5	5	6	6	7	7	7	8
	9	Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135
					IPT(fz)	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
					RPM	24800	24800	23000	24600	21300	18900	16500	15200	14300	12700	10900
					IPM(FEED)	2	2	2	3	3	3	4	4	5	5	5
	10	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225
					IPT(fz)	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
					RPM	41300	41300	38400	40900	35400	31500	27600	25400	23800	21200	18100
					IPM(FEED)	4	4	4	5	5	6	6	7	7	7	8
	11.1-11.2		1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135
					IPT(fz)	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
					RPM	24800	24800	23000	24600	21300	18900	16500	15200	14300	12700	10900
					IPM(FEED)	2	2	2	3	3	3	4	4	5	5	5
M	14.1	Stainless steel	1.0D	0.05D (Up to Ø1/32 : 0.15D)	SFM(Vc)	20	45	60	80	95	100	100	105	110	110	110
					IPT(fz)	.00004	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
					RPM	20670	20670	19190	20470	17720	15750	13780	12700	11900	10580	9050
					IPM(FEED)	2	2	2	2	2	3	3	4	4	4	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225
					IPT(fz)	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
					RPM	41300	41300	38400	40900	35400	31500	27600	25400	23800	21200	18100
					IPM(FEED)	4	4	4	5	5	6	6	7	7	7	8
H	38.1-38.2	Hardened steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	15	35	50	65	75	80	80	80	85	90	90
					IPT(fz)	.00003	.00003	.00003	.00003	.00004	.00004	.00005	.00005	.0001	.0001	.0001
					RPM	16540	16540	15350	16380	14170	12600	11020	10160	9520	8460	7240
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	2
	40	Chilled Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135
					IPT(fz)	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
					RPM	24800	24800	23000	24600	21300	18900	16500	15200	14300	12700	10900
					IPM(FEED)	2	2	2	3	3	3	4	4	5	5	5
	41	Hardened Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	15	35	50	65	75	80	80	80	85	90	90
					IPT(fz)	.00003	.00003	.00003	.00003	.00004	.00004	.00005	.00005	.0001	.0001	.0001
					RPM	16540	16540	15350	16380	14170	12600	11020	10160	9520	8460	7240
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	2

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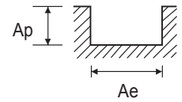

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF23 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/16	5/64	3/32	1/8	9/64	3/16	13/64	1/4	17/64	9/32
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	230	240	265	275	300	320	325	345	350	355
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0010	.0011	.0013	.0014	.0016
					RPM	14200	11700	10800	8400	8100	6500	6100	5300	5000	4800
					IPM(FEED)	8	8	9	9	11	13	13	14	14	15
	9	Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	140	155	170	175	185	195	195	210	210	215
					IPT(fz)	.0003	.0003	.0004	.0005	.0007	.0010	.0011	.0014	.0015	.0015
					RPM	8500	7600	6900	5300	5000	4000	3700	3200	3000	2900
					IPM(FEED)	5	5	6	6	7	8	8	9	9	9
	10	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	230	240	265	275	300	320	325	345	350	355
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0010	.0011	.0013	.0014	.0016
					RPM	14200	11700	10800	8400	8100	6500	6100	5300	5000	4800
					IPM(FEED)	8	8	9	9	11	13	13	14	14	15
	11.1-11.2		1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	140	155	170	175	185	195	195	210	210	215
					IPT(fz)	.0003	.0003	.0004	.0005	.0007	.0010	.0011	.0014	.0015	.0015
					RPM	8500	7600	6900	5300	5000	4000	3700	3200	3000	2900
					IPM(FEED)	5	5	6	6	7	8	8	9	9	9
M	14.1	Stainless steel	1.0D	0.05D (Up to Ø1/32 : 0.15D)	SFM(Vc)	115	130	140	145	155	165	165	175	180	180
					IPT(fz)	.0003	.0003	.0004	.0006	.0007	.0009	.0011	.0014	.0014	.0015
					RPM	7090	6350	5730	4370	4160	3330	3060	2680	2560	2420
					IPM(FEED)	4	4	5	5	6	6	7	7	7	7
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	230	240	265	275	300	320	325	345	350	355
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0010	.0011	.0013	.0014	.0016
					RPM	14200	11700	10800	8400	8100	6500	6100	5300	5000	4800
					IPM(FEED)	8	8	9	9	11	13	13	14	14	15
H	38.1-38.2	Hardened steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	95	105	110	105	115	120	120	125	130	135
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0008	.0008
					RPM	5670	5080	4410	3170	3090	2490	2250	1890	1850	1800
					IPM(FEED)	1	2	2	2	2	2	2	2	3	3
	40	Chilled Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	140	155	170	175	185	195	195	210	210	215
					IPT(fz)	.0003	.0003	.0004	.0005	.0007	.0010	.0011	.0014	.0015	.0015
					RPM	8500	7600	6900	5300	5000	4000	3700	3200	3000	2900
					IPM(FEED)	5	5	6	6	7	8	8	9	9	9
	41	Hardened Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	95	105	110	105	115	120	120	125	130	135
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0008	.0008
					RPM	5670	5080	4410	3170	3090	2490	2250	1890	1850	1800
					IPM(FEED)	1	2	2	2	2	2	2	2	3	3

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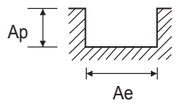
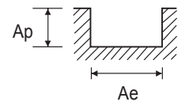


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF23 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 5/16	11/32	23/64	3/8	13/32	7/16	1/2	9/16	5/8	3/4
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	345	350	350	335	340	345	340	355	360	355
					IPT(fz)	.0019	.0019	.0020	.0021	.0021	.0021	.0022	.0021	.0021	.0021
					RPM	4200	3900	3700	3400	3200	3000	2600	2400	2200	1800
					IPM(FEED)	16	15	15	14	13	12	11	10	9	7
	9	Low alloy steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	205	205	205	205	215	205	210	220	230	215
					IPT(fz)	.0017	.0017	.0016	.0017	.0016	.0017	.0017	.0017	.0016	.0016
					RPM	2500	2300	2200	2100	2000	1800	1600	1500	1400	1100
					IPM(FEED)	8	8	7	7	6	6	5	5	5	4
	10	High alloyed steel, and tool steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	345	350	350	335	340	345	340	355	360	355
					IPT(fz)	.0019	.0019	.0020	.0021	.0021	.0021	.0022	.0021	.0021	.0021
					RPM	4200	3900	3700	3400	3200	3000	2600	2400	2200	1800
					IPM(FEED)	16	15	15	14	13	12	11	10	9	7
	11.1-11.2		1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	205	205	205	205	215	205	210	220	230	215
					IPT(fz)	.0017	.0017	.0016	.0017	.0016	.0017	.0017	.0017	.0016	.0016
					RPM	2500	2300	2200	2100	2000	1800	1600	1500	1400	1100
					IPM(FEED)	8	8	7	7	6	6	5	5	5	4
M	14.1	Stainless steel	1.0D	0.05D (Up to Ø1/32 : 0.15D)	SFM(Vc)	175	175	175	175	175	170	170	175	175	175
					IPT(fz)	.0017	.0018	.0019	.0020	.0020	.0020	.0021	.0021	.0021	.0020
					RPM	2120	1940	1860	1760	1630	1500	1290	1190	1070	880
					IPM(FEED)	7	7	7	7	6	6	5	5	5	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	345	350	350	335	340	345	340	355	360	355
					IPT(fz)	.0019	.0019	.0020	.0021	.0021	.0021	.0022	.0021	.0021	.0021
					RPM	4200	3900	3700	3400	3200	3000	2600	2400	2200	1800
					IPM(FEED)	16	15	15	14	13	12	11	10	9	7
H	38.1-38.2	Hardened steel	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	140	140	140	140	140	145	145	150	150	140
					IPT(fz)	.0009	.0010	.0010	.0010	.0011	.0008	.0009	.0010	.0011	.0007
					RPM	1690	1560	1500	1430	1330	1250	1100	1010	910	710
					IPM(FEED)	3	3	3	3	3	2	2	2	2	1
	40	Chilled Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	205	205	205	205	215	205	210	220	230	215
					IPT(fz)	.0017	.0017	.0016	.0017	.0016	.0017	.0017	.0017	.0016	.0016
					RPM	2500	2300	2200	2100	2000	1800	1600	1500	1400	1100
					IPM(FEED)	8	8	7	7	6	6	5	5	5	4
	41	Hardened Cast Iron	1.0D	0.5D (Up to Ø1/8 : 0.2D) (Up to Ø1/32 : 0.15D)	SFM(Vc)	140	140	140	140	140	145	145	150	150	140
					IPT(fz)	.0009	.0010	.0010	.0010	.0011	.0008	.0009	.0010	.0011	.0007
					RPM	1690	1560	1500	1430	1330	1250	1100	1010	910	710
					IPM(FEED)	3	3	3	3	3	2	2	2	2	1



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF24 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						3/64	3/64	3/64	3/64	3/64	1/16	1/16	1/16	1/16	1/16	5/64	5/64	5/64	5/64
					LOC	1/8	5/32	1/4	5/16	3/8	1/4	5/16	3/8	1/2	5/8	5/16	3/8	1/2	5/8
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	170	170	150	150	150	165	165	145	145	145	190	190	170	170
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0001
					RPM	13710	13710	12340	12340	12340	10000	10000	9000	9000	9000	9210	9210	8290	8290
					IPM(FEED)	3	3	3	2	2	3	3	2	2	2	3	3	3	2
	9	Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	135	135	120	120	120	130	130	120	120	120	150	150	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	10970	10970	9870	9870	9870	8000	8000	7200	7200	7200	7370	7370	6640	6640
					IPM(FEED)	3	3	2	2	2	2	2	2	2	2	3	3	2	2
	10	High alloyed steel, and tool steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	170	170	150	150	150	165	165	145	145	145	190	190	170	170
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0001
					RPM	13710	13710	12340	12340	12340	10000	10000	9000	9000	9000	9210	9210	8290	8290
					IPM(FEED)	3	3	3	2	2	3	3	2	2	2	3	3	3	2
	11.1-11.2		1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	135	135	120	120	120	130	130	120	120	120	150	150	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	10970	10970	9870	9870	9870	8000	8000	7200	7200	7200	7370	7370	6640	6640
					IPM(FEED)	3	3	2	2	2	2	2	2	2	2	3	3	2	2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	170	170	150	150	150	165	165	145	145	145	190	190	170	170
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	13710	13710	12340	12340	12340	10000	10000	9000	9000	9000	9210	9210	8290	8290
					IPM(FEED)	3	3	3	2	2	3	3	2	2	2	3	3	3	3
H	38.1-38.2	Hardened steel	1.0D	0.05D	SFM(Vc)	85	85	75	75	75	80	80	75	75	75	95	95	85	85
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001
					RPM	6860	6860	6170	6170	6170	5000	5000	4500	4500	4500	4610	4610	4150	4150
					IPM(FEED)	1.2	1.2	1.0	1.0	0.8	1.0	1.0	0.8	0.8	0.8	1.4	1.4	1.2	1.2
	40	Chilled Cast Iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	135	135	120	120	120	130	130	120	120	120	150	150	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	10970	10970	9870	9870	9870	8000	8000	7200	7200	7200	7370	7370	6640	6640
					IPM(FEED)	3	3	2	2	2	2	2	2	2	2	3	3	2	2
	41	Hardened Cast Iron	1.0D	0.05D	SFM(Vc)	85	85	75	75	75	80	80	75	75	75	95	95	85	85
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001
					RPM	6860	6860	6170	6170	6170	5000	5000	4500	4500	4500	4610	4610	4150	4150
					IPM(FEED)	1.2	1.2	1.0	1.0	0.8	1.0	1.0	0.8	0.8	0.8	1.4	1.4	1.2	1.0

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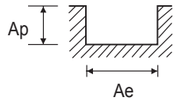

4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
GMF24 SERIES — 2 FLUTE SQUARE - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						3/32	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	13/64	13/64	13/64
					LOC	5/8	3/8	1/2	5/8	3/4	1	1/2	5/8	3/4	1	1-3/16	3/4	1	1-3/16
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	190	185	185	185	165	165	180	180	180	160	160	220	220	200
					IPT(fz)	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0007	.0007	.0006
					RPM	7640	5670	5670	5670	5100	5100	3630	3630	3630	3270	3270	4130	4130	3720
					IPM(FEED)	3	4	4	4	3	3	3	3	3	3	3	6	6	5
	9	Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	150	150	150	150	135	135	140	140	140	130	130	175	175	155
					IPT(fz)	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0007	.0007	.0006
					RPM	6150	4600	4600	4600	4140	4140	2890	2890	2890	2600	2600	3270	3270	2940
					IPM(FEED)	3	3	3	3	2	2	3	3	3	3	2	5	5	4
	10	High alloyed steel, and tool steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	190	185	185	185	165	165	180	180	180	160	160	220	220	200
					IPT(fz)	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0007	.0007	.0006
					RPM	7640	5670	5670	5670	5100	5100	3630	3630	3630	3270	3270	4130	4130	3720
					IPM(FEED)	3	4	4	4	3	3	3	3	3	3	3	6	6	5
	11.1-11.2		1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	150	150	150	150	135	135	140	140	140	130	130	175	175	155
					IPT(fz)	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0007	.0007	.0006
					RPM	6150	4600	4600	4600	4140	4140	2890	2890	2890	2600	2600	3270	3270	2940
					IPM(FEED)	3	3	3	3	2	2	3	3	3	3	2	5	5	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	170	190	185	185	185	165	165	180	180	180	160	160	220	200
					IPT(fz)	.0001	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0007	.0006
					RPM	8290	7640	5670	5670	5670	5100	5100	3630	3630	3630	3270	3270	4130	3720
					IPM(FEED)	2	3	4	4	4	3	3	3	3	3	3	3	6	5
H	38.1-38.2	Hardened steel	1.0D	0.05D	SFM(Vc)	85	95	95	95	95	85	85	90	90	90	80	80	115	105
					IPT(fz)	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0005	.0004
					RPM	4150	3820	2830	2830	2830	2550	2550	1820	1820	1820	1640	1640	2140	1930
					IPM(FEED)	1.0	1.4	1.4	1.4	1.4	1.2	1.0	1.4	1.4	1.4	1.2	1.2	2.0	1.6
	40	Chilled Cast Iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	150	150	150	150	135	135	140	140	140	130	130	175	175	155
					IPT(fz)	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0007	.0007	.0006
					RPM	6150	4600	4600	4600	4140	4140	2890	2890	2890	2600	2600	3270	3270	2940
					IPM(FEED)	3	3	3	3	2	2	3	3	3	3	2	5	5	4
	41	Hardened Cast Iron	1.0D	0.05D	SFM(Vc)	95	95	95	95	85	85	90	90	90	80	80	115	115	105
					IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0005	.0005	.0004
					RPM	3820	2830	2830	2830	2550	2550	1820	1820	1820	1640	1640	2140	2140	1930
					IPM(FEED)	1.4	1.4	1.4	1.4	1.2	1.0	1.4	1.4	1.4	1.2	1.2	2.0	2.0	1.6

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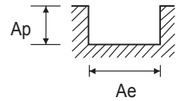

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF24 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						13/64	1/4	1/4	1/4	1/4	1/4	1/4	1/4	5/16	5/16	5/16	5/16	5/16	5/16
					LOC	1-1/2	5/8	3/4	1	1-3/16	1-3/8	1-1/2	1-3/4	1	1-3/16	1-3/8	1-1/2	1-3/4	2
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	200	220	220	220	220	200	200	200	240	240	240	240	215	215
					IPT(fz)	.0006	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010
					RPM	3720	3390	3390	3390	3390	3050	3050	3050	2930	2930	2930	2930	2630	2630
					IPM(FEED)	5	6	6	6	5	5	4	4	8	8	8	7	6	5
	9	Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	155	180	180	180	180	160	160	160	190	190	190	190	170	170
					IPT(fz)	.0006	.0010	.0010	.0010	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010
					RPM	2940	2720	2720	2720	2720	2450	2450	2450	2320	2320	2320	2320	2080	2080
					IPM(FEED)	4	5	5	5	5	4	4	4	6	6	6	5	5	4
	10	High alloyed steel, and tool steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	200	220	220	220	220	200	200	200	240	240	240	240	215	215
					IPT(fz)	.0006	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010
					RPM	3720	3390	3390	3390	3390	3050	3050	3050	2930	2930	2930	2930	2630	2630
					IPM(FEED)	5	6	6	6	5	5	4	4	8	8	8	7	6	5
	11.1-11.2		1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	155	180	180	180	180	160	160	160	190	190	190	190	170	170
					IPT(fz)	.0006	.0010	.0010	.0010	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010
					RPM	2940	2720	2720	2720	2720	2450	2450	2450	2320	2320	2320	2320	2080	2080
					IPM(FEED)	4	5	5	5	5	4	4	4	6	6	6	5	5	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	200	220	220	220	220	200	200	200	240	240	240	240	215	215
					IPT(fz)	.0006	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010
					RPM	3720	3390	3390	3390	3390	3050	3050	3050	2930	2930	2930	2930	2630	2630
					IPM(FEED)	5	6	6	6	5	5	4	4	8	8	8	7	6	5
H	38.1-38.2	Hardened steel	1.0D	0.05D	SFM(Vc)	105	115	115	115	115	105	105	105	125	125	125	125	115	115
					IPT(fz)	.0004	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0008	.0008	.0007
					RPM	1930	1760	1760	1760	1760	1580	1580	1580	1530	1530	1530	1530	1380	1380
					IPM(FEED)	1.6	2.4	2.4	2.4	2.2	2.0	1.6	1.6	2.8	2.8	2.8	2.4	2.2	2.0
	40	Chilled Cast Iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	155	180	180	180	180	160	160	160	190	190	190	190	170	170
					IPT(fz)	.0006	.0010	.0010	.0010	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010
					RPM	2940	2720	2720	2720	2720	2450	2450	2450	2320	2320	2320	2320	2080	2080
					IPM(FEED)	4	5	5	5	5	4	4	4	6	6	6	5	5	4
	41	Hardened Cast Iron	1.0D	0.05D	SFM(Vc)	105	115	115	115	115	105	105	105	125	125	125	125	115	115
					IPT(fz)	.0004	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0008	.0008	.0007
					RPM	1930	1760	1760	1760	1760	1580	1580	1580	1530	1530	1530	1530	1380	1380
					IPM(FEED)	1.6	2.4	2.4	2.4	2.2	2.0	1.6	1.6	2.8	2.8	2.8	2.4	2.2	2.0

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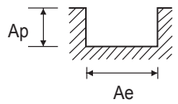


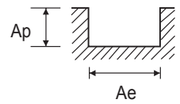
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF24 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						3/8	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	1/2	1/2	5/8	3/4	3/4
					LOC	1-3/16	1-3/8	1-1/2	1-3/4	2	2-3/8	1-3/8	1-1/2	1-3/4	2	2-1/8	2-3/8	1-1/2	3-1/2	4-1/4
P	1-8	Non-alloy steel Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	265	265	265	265	240	240	235	235	235	235	235	235	285	265	240
					IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0011	.0015	.0015	.0015	.0013	.0013	.0013	.0016	.0013	.0012
					RPM	2700	2700	2700	2700	2430	2430	1790	1790	1790	1790	1790	1790	1730	1340	1210
					IPM(FEED)	8	8	8	7	6	6	5	5	5	5	5	5	6	3	3
	9	Low alloy steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	215	215	215	215	195	195	195	195	195	195	195	195	215	205	185
					IPT(fz)	.0015	.0015	.0015	.0013	.0012	.0011	.0016	.0016	.0016	.0013	.0013	.0013	.0016	.0011	.0011
					RPM	2200	2200	2200	2200	1980	1980	1490	1490	1490	1490	1490	1490	1300	1050	940
					IPM(FEED)	7	7	7	6	5	4	5	5	5	4	4	4	4	2	2
	10	High alloyed steel, and tool steel	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	265	265	265	265	240	240	235	235	235	235	235	235	285	265	240
					IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0011	.0015	.0015	.0015	.0013	.0013	.0013	.0016	.0013	.0012
					RPM	2700	2700	2700	2700	2430	2430	1790	1790	1790	1790	1790	1790	1730	1340	1210
					IPM(FEED)	8	8	8	7	6	6	5	5	5	5	5	5	6	3	3
	11.1-11.2		1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	215	215	215	215	195	195	195	195	195	195	195	195	215	205	185
					IPT(fz)	.0015	.0015	.0015	.0013	.0012	.0011	.0016	.0016	.0016	.0013	.0013	.0013	.0016	.0011	.0011
					RPM	2200	2200	2200	2200	1980	1980	1490	1490	1490	1490	1490	1490	1300	1050	940
					IPM(FEED)	7	7	7	6	5	4	5	5	5	4	4	4	4	2	2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	265	265	265	265	240	240	235	235	235	235	235	235	285	265	240
					IPT(fz)	.0015	.0015	.0015	.0013	.0013	.0011	.0015	.0015	.0015	.0013	.0013	.0013	.0016	.0013	.0012
					RPM	2700	2700	2700	2700	2430	2430	1790	1790	1790	1790	1790	1790	1730	1340	1210
					IPM(FEED)	8	8	8	7	6	6	5	5	5	5	5	5	6	3	3
H	38.1-38.2	Hardened steel	1.0D	0.05D	SFM(Vc)	130	130	130	130	120	120	120	120	120	120	120	120	135	130	120
					IPT(fz)	.0011	.0011	.0011	.0010	.0010	.0008	.0011	.0011	.0011	.0009	.0009	.0009	.0012	.0009	.0008
					RPM	1330	1330	1330	1330	1200	1200	900	900	900	900	900	900	810	660	600
					IPM(FEED)	3.0	3.0	3.0	2.6	2.4	2.0	2.0	2.0	2.0	1.6	1.6	1.6	2.0	1.2	1.0
	40	Chilled Cast Iron	1.0D	0.3D (Up to Ø1/8 : 0.2D)	SFM(Vc)	215	215	215	215	195	195	195	195	195	195	195	195	215	205	185
					IPT(fz)	.0015	.0015	.0015	.0013	.0012	.0011	.0016	.0016	.0016	.0013	.0013	.0013	.0016	.0011	.0011
					RPM	2200	2200	2200	2200	1980	1980	1490	1490	1490	1490	1490	1490	1300	1050	940
					IPM(FEED)	7	7	7	6	5	4	5	5	5	4	4	4	4	2	2
	41	Hardened Cast Iron	1.0D	0.05D	SFM(Vc)	130	130	130	130	120	120	120	120	120	120	120	120	135	130	120
					IPT(fz)	.0011	.0011	.0011	.0010	.0010	.0008	.0011	.0011	.0011	.0009	.0009	.0009	.0012	.0009	.0008
					RPM	1330	1330	1330	1330	1200	1200	900	900	900	900	900	900	810	660	600
					IPM(FEED)	3.0	3.0	3.0	2.6	2.4	2.0	2.0	2.0	2.0	1.6	1.6	1.6	2.0	1.2	1.0



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF25, GMF26 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/64	1/16	5/16	3/32	1/8	9/64	3/16	13/64	7/32	1/4	17/64
P	1-8	Non-alloy steel Low alloy steel	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430	435
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010	.0011
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570	6290
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27	28
	9	Low alloy steel	0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260	265
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011	.0011
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970	3800
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17	17
	10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430	435
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010	.0011
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570	6290
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27	28
	11.1-11.2		0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260	265
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011	.0011
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970	3800
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17	17
M	14.1	Stainless steel	0.05D	1.0D	SFM(Vc)	140	145	650	175	180	190	205	205	210	220	225
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010	.0011
					RPM	11340	8860	7940	7170	5460	5200	4160	3830	3710	3350	3200
					IPM(FEED)	6	6	6	7	7	10	12	13	13	13	14
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	280	290	1190	330	345	370	400	405	420	430	435
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0007	.0008	.0009	.0010	.0011
					RPM	22680	17720	14560	13440	10540	10090	8180	7640	7330	6570	6290
					IPM(FEED)	12	11	12	14	13	19	24	25	27	27	28
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	110	115	130	135	130	140	155	150	155	155	160
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003	.0004
					RPM	9070	7090	6350	5510	3970	3860	3110	2810	2670	2360	2310
					IPM(FEED)	2	2	2	3	2	3	3	3	3	3	4
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	165	175	780	210	215	230	245	245	255	260	265
					IPT(fz)	.0001	.0002	.0002	.0002	.0003	.0005	.0007	.0008	.0009	.0011	.0011
					RPM	13610	10630	9520	8610	6570	6230	4960	4580	4410	3970	3800
					IPM(FEED)	7	7	7	9	8	12	15	15	17	17	17
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	110	115	130	135	130	140	155	150	155	155	160
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0003	.0004
					RPM	9070	7090	6350	5510	3970	3860	3110	2810	2670	2360	2310
					IPM(FEED)	2	2	2	3	2	3	3	3	3	3	4

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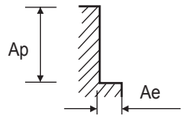
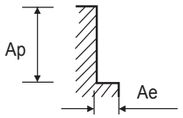


4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS

GMF25, GMF26 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 9/32	19/64	5/16	11/32	23/64	3/8	7/16	1/2	9/16	5/8	3/4
P	1-8	Non-alloy steel Low alloy steel	0.05D	1.0D	SFM(Vc)	440	440	435	435	430	420	425	425	445	455	430
					IPT(fz)	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016
					RPM	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200
					IPM(FEED)	28	29	30	28	27	27	23	21	19	18	14
	9	Low alloy steel	0.05D	1.0D	SFM(Vc)	265	265	260	260	260	255	260	260	275	280	275
					IPT(fz)	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013
					RPM	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400
					IPM(FEED)	16	16	16	15	14	13	11	10	9	9	7
	10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	440	440	435	435	430	420	425	425	445	455	430
					IPT(fz)	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016
					RPM	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200
					IPM(FEED)	28	29	30	28	27	27	23	21	19	18	14
	11.1-11.2		0.05D	1.0D	SFM(Vc)	265	265	260	260	260	255	260	260	275	280	275
					IPT(fz)	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013
					RPM	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400
					IPM(FEED)	16	16	16	15	14	13	11	10	9	9	7
M	14.1	Stainless steel	0.05D	1.0D	SFM(Vc)	225	220	215	220	220	215	215	210	220	225	215
					IPT(fz)	.0011	.0013	.0014	.0014	.0014	.0015	.0015	.0015	.0015	.0015	.0015
					RPM	3030	2840	2650	2420	2330	2200	1880	1610	1510	1390	1100
					IPM(FEED)	14	14	15	14	13	13	11	10	9	8	6
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	440	440	435	435	430	420	425	425	445	455	430
					IPT(fz)	.0012	.0013	.0014	.0014	.0015	.0015	.0016	.0016	.0016	.0016	.0016
					RPM	5980	5650	5290	4830	4590	4280	3710	3240	3030	2770	2200
					IPM(FEED)	28	29	30	28	27	27	23	21	19	18	14
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	165	170	175	175	175	175	180	180	185	185	175
					IPT(fz)	.0004	.0005	.0006	.0005	.0005	.0006	.0006	.0005	.0006	.0007	.0006
					RPM	2250	2190	2120	1950	1870	1780	1560	1370	1260	1140	890
					IPM(FEED)	4	4	5	4	4	4	4	3	3	3	2
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	265	265	260	260	260	255	260	260	275	280	275
					IPT(fz)	.0011	.0012	.0013	.0012	.0012	.0012	.0012	.0013	.0012	.0012	.0013
					RPM	3610	3390	3170	2910	2790	2620	2280	1980	1860	1710	1400
					IPM(FEED)	16	16	16	15	14	13	11	10	9	9	7
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	165	170	175	175	175	175	180	180	185	185	175
					IPT(fz)	.0004	.0005	.0006	.0005	.0005	.0006	.0006	.0005	.0006	.0007	.0006
					RPM	2250	2190	2120	1950	1870	1780	1560	1370	1260	1140	890
					IPM(FEED)	4	4	5	4	4	4	4	3	3	3	2



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						3/64	3/64	3/64	3/64	1/16	5/64	5/64	5/64	5/64	3/32	3/32	1/8	1/8
					LOC	1/8	5/32	3/16	1/4	1/4	5/16	3/8	1/2	9/16	3/8	1/2	3/8	1/2
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.5D	SFM(Vc)	200	200	200	180	215	220	220	195	195	230	210	230	230
					IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	16330	16330	16330	14690	13040	10670	10670	9600	9600	9440	8500	7000	7000
					IPM(FEED)	8	8	8	7	8	10	10	8	8	11	10	10	10
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	115	115	115	105	120	125	125	110	110	135	120	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003
					RPM	9310	9310	9310	8380	7430	6100	6100	5490	5490	5420	4880	4050	4050
					IPM(FEED)	3	3	3	3	3	4	4	3	3	5	4	5	5
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	200	200	200	180	215	220	220	195	195	230	210	230	230
					IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	16330	16330	16330	14690	13040	10670	10670	9600	9600	9440	8500	7000	7000
					IPM(FEED)	8	8	8	7	8	10	10	8	8	11	10	10	10
	11.1-11.2		0.05D	2.5D	SFM(Vc)	115	115	115	105	120	125	125	110	110	135	120	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003
					RPM	9310	9310	9310	8380	7430	6100	6100	5490	5490	5420	4880	4050	4050
					IPM(FEED)	3	3	3	3	3	4	4	3	3	5	4	5	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	200	200	200	180	215	220	220	195	195	230	210	230	230
					IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	16330	16330	16330	14690	13040	10670	10670	9600	9600	9440	8500	7000	7000
					IPM(FEED)	8	8	8	7	8	10	10	8	8	11	10	10	10
H	38.1-38.2	Hardened steel	0.02	2.0D	SFM(Vc)	70	70	70	65	75	80	80	70	70	85	75	80	80
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	5710	5710	5710	5140	4560	3810	3810	3430	3430	3370	3030	2490	2490
					IPM(FEED)	2	2	2	1	2	2	2	2	2	3	2	2	2
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	115	115	115	105	120	125	125	110	110	135	120	135	135
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003
					RPM	9310	9310	9310	8380	7430	6100	6100	5490	5490	5420	4880	4050	4050
					IPM(FEED)	3	3	3	3	3	4	4	3	3	5	4	5	5
	41	Hardened Cast Iron	0.05D	2.5D	SFM(Vc)	70	70	70	65	75	80	80	70	70	85	75	80	80
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
					RPM	5710	5710	5710	5140	4560	3810	3810	3430	3430	3370	3030	2490	2490
					IPM(FEED)	2	2	2	1	2	2	2	2	2	3	2	2	2

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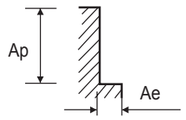

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	13/64	13/64	13/64	1/4
					LOC	5/8	3/4	1	1-3/16	1/2	5/8	3/4	1	1-3/16	3/4	1	1-3/16	5/8
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.5D	SFM(Vc)	230	205	205	205	245	245	245	225	225	265	265	240	275
					IPT(fz)	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0008	.0008	.0008	.0012
					RPM	7000	6300	6300	6300	5040	5040	5040	4540	4540	4970	4970	4470	4170
					IPM(FEED)	10	8	8	8	11	11	11	10	9	17	17	13	19
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	135	120	120	120	140	140	140	125	125	150	150	135	155
					IPT(fz)	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0009
					RPM	4050	3640	3640	3640	2860	2860	2860	2580	2580	2810	2810	2530	2380
					IPM(FEED)	5	4	3	3	5	5	5	4	4	7	7	5	8
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	230	205	205	205	245	245	245	225	225	265	265	240	275
					IPT(fz)	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0008	.0008	.0008	.0012
					RPM	7000	6300	6300	6300	5040	5040	5040	4540	4540	4970	4970	4470	4170
					IPM(FEED)	10	8	8	8	11	11	11	10	9	17	17	13	19
	11.1-11.2		0.05D	2.5D	SFM(Vc)	135	120	120	120	140	140	140	125	125	150	150	135	155
					IPT(fz)	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0009
					RPM	4050	3640	3640	3640	2860	2860	2860	2580	2580	2810	2810	2530	2380
					IPM(FEED)	5	4	3	3	5	5	5	4	4	7	7	5	8
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	230	205	205	205	245	245	245	225	225	265	265	240	275
					IPT(fz)	.0004	.0003	.0003	.0003	.0006	.0006	.0006	.0006	.0005	.0008	.0008	.0008	.0012
					RPM	7000	6300	6300	6300	5040	5040	5040	4540	4540	4970	4970	4470	4170
					IPM(FEED)	10	8	8	8	11	11	11	10	9	17	17	13	19
H	38.1-38.2	Hardened steel	0.02	2.0D	SFM(Vc)	80	75	75	75	90	90	90	80	80	100	100	90	100
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0006
					RPM	2490	2250	2250	2250	1800	1800	1800	1620	1620	1840	1840	1650	1550
					IPM(FEED)	2	2	2	2	2	2	2	2	2	3	3	3	4
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	135	120	120	120	140	140	140	125	125	150	150	135	155
					IPT(fz)	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0009
					RPM	4050	3640	3640	3640	2860	2860	2860	2580	2580	2810	2810	2530	2380
					IPM(FEED)	5	4	3	3	5	5	5	4	4	7	7	5	8
	41	Hardened Cast Iron	0.05D	2.5D	SFM(Vc)	80	75	75	75	90	90	90	80	80	100	100	90	100
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0006
					RPM	2490	2250	2250	2250	1800	1800	1800	1620	1620	1840	1840	1650	1550
					IPM(FEED)	2	2	2	2	2	2	2	2	2	3	3	3	4

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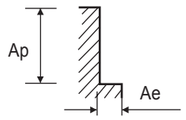

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						1/4	1/4	1/4	1/4	1/4	1/4	5/16	5/16	5/16	5/16	5/16	5/16	3/8
					LOC	3/4	1	1-3/16	1-3/8	1-1/2	1-3/4	1	1-3/16	1-3/8	1-1/2	1-3/4	2	1-3/16
P	1-8	Non-alloy steel Low alloy steel	0.05D	2.5D	SFM(Vc)	275	275	275	245	245	245	275	275	275	275	250	250	290
					IPT(fz)	.0012	.0012	.0010	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019
					RPM	4170	4170	4170	3760	3760	3760	3390	3390	3390	3390	3050	3050	2960
					IPM(FEED)	19	19	16	15	13	13	22	22	22	19	17	15	23
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	155	155	155	140	140	140	155	155	155	155	140	140	170
					IPT(fz)	.0009	.0009	.0007	.0007	.0006	.0006	.0011	.0011	.0011	.0010	.0009	.0008	.0013
					RPM	2380	2380	2380	2140	2140	2140	1910	1910	1910	1910	1720	1720	1730
					IPM(FEED)	8	8	7	6	6	6	9	9	9	7	7	6	9
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	275	275	275	245	245	245	275	275	275	275	250	250	290
					IPT(fz)	.0012	.0012	.0010	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019
					RPM	4170	4170	4170	3760	3760	3760	3390	3390	3390	3390	3050	3050	2960
					IPM(FEED)	19	19	16	15	13	13	22	22	22	19	17	15	23
	11.1-11.2		0.05D	2.5D	SFM(Vc)	155	155	155	140	140	140	155	155	155	155	140	140	170
					IPT(fz)	.0009	.0009	.0007	.0007	.0006	.0006	.0011	.0011	.0011	.0010	.0009	.0008	.0013
					RPM	2380	2380	2380	2140	2140	2140	1910	1910	1910	1910	1720	1720	1730
					IPM(FEED)	8	8	7	6	6	6	9	9	9	7	7	6	9
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	275	275	275	245	245	245	275	275	275	275	250	250	290
					IPT(fz)	.0012	.0012	.0010	.0010	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019
					RPM	4170	4170	4170	3760	3760	3760	3390	3390	3390	3390	3050	3050	2960
					IPM(FEED)	19	19	16	15	13	13	22	22	22	19	17	15	23
H	38.1-38.2	Hardened steel	0.02	2.0D	SFM(Vc)	100	100	100	90	90	90	105	105	105	105	95	95	105
					IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0008	.0007	.0011
					RPM	1550	1550	1550	1400	1400	1400	1270	1270	1270	1270	1140	1140	1060
					IPM(FEED)	4	4	3	3	3	3	4	4	4	4	3	3	5
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	155	155	155	140	140	140	155	155	155	155	140	140	170
					IPT(fz)	.0009	.0009	.0007	.0007	.0006	.0006	.0011	.0011	.0011	.0010	.0009	.0008	.0013
					RPM	2380	2380	2380	2140	2140	2140	1910	1910	1910	1910	1720	1720	1730
					IPM(FEED)	8	8	7	6	6	6	9	9	9	7	7	6	9
	41	Hardened Cast Iron	0.05D	2.5D	SFM(Vc)	100	100	100	90	90	90	105	105	105	105	95	95	105
					IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0008	.0007	.0011
					RPM	1550	1550	1550	1400	1400	1400	1270	1270	1270	1270	1140	1140	1060
					IPM(FEED)	4	4	3	3	3	3	4	4	4	4	3	3	5

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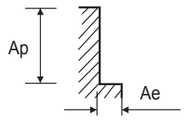
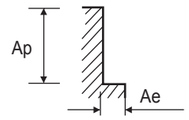


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF27 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)																	
					3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	1/2	1/2	9/16	5/8	5/8	5/8	3/4	3/4	1	
				LOC	1-3/8	1-1/2	1-3/4	2	1-3/8	1-1/2	1-3/4	2	2-1/8	2-3/8	2	2	2-3/8	2-3/4	2-3/8	3-1/2	3-1/2	
P	1-8	0.05D	2.5D	SFM(Vc)	290	290	290	260	285	285	285	285	285	285	305	320	320	320	295	295	285	
				IPT(fz)	.0019	.0019	.0017	.0016	.0019	.0019	.0019	.0016	.0016	.0016	.0016	.0019	.0017	.0017	.0016	.0014	.0016	
				RPM	2960	2960	2960	2660	2180	2180	2180	2180	2180	2180	2080	1960	1960	1960	1490	1490	1090	
				IPM(FEED)	23	23	20	18	16	16	16	14	14	14	13	15	13	13	10	9	7	
	9	0.05D	2.5D	SFM(Vc)	170	170	170	150	175	175	175	175	175	175	180	175	175	175	170	170	210	
				IPT(fz)	.0013	.0013	.0011	.0011	.0013	.0013	.0013	.0012	.0012	.0012	.0011	.0014	.0012	.0012	.0011	.0010	.0011	
				RPM	1730	1730	1730	1550	1320	1320	1320	1320	1320	1320	1210	1080	1080	1080	860	860	800	
				IPM(FEED)	9	9	8	7	7	7	7	6	6	6	6	6	5	5	4	3	4	
	10	0.05D	2.5D	SFM(Vc)	290	290	290	260	285	285	285	285	285	285	305	320	320	320	295	295	285	
				IPT(fz)	.0019	.0019	.0017	.0016	.0019	.0019	.0019	.0016	.0016	.0016	.0016	.0019	.0017	.0017	.0016	.0014	.0016	
				RPM	2960	2960	2960	2660	2180	2180	2180	2180	2180	2180	2080	1960	1960	1960	1490	1490	1090	
				IPM(FEED)	23	23	20	18	16	16	16	14	14	14	13	15	13	13	10	9	7	
	11.1-11.2	0.05D	2.5D	SFM(Vc)	170	170	170	150	175	175	175	175	175	175	180	175	175	175	170	170	210	
				IPT(fz)	.0013	.0013	.0011	.0011	.0013	.0013	.0013	.0012	.0012	.0012	.0011	.0014	.0012	.0012	.0011	.0010	.0011	
				RPM	1730	1730	1730	1550	1320	1320	1320	1320	1320	1320	1210	1080	1080	1080	860	860	800	
				IPM(FEED)	9	9	8	7	7	7	7	6	6	6	6	6	5	5	4	3	4	
K	15-20	0.05D	2.5D	SFM(Vc)	290	290	290	260	285	285	285	285	285	285	305	320	320	320	295	295	285	
				IPT(fz)	.0019	.0019	.0017	.0016	.0019	.0019	.0019	.0016	.0016	.0016	.0016	.0019	.0017	.0017	.0016	.0014	.0016	
				RPM	2960	2960	2960	2660	2180	2180	2180	2180	2180	2180	2080	1960	1960	1960	1490	1490	1090	
				IPM(FEED)	23	23	20	18	16	16	16	14	14	14	13	15	13	13	10	9	7	
H	38.1-38.2	0.02	2.0D	SFM(Vc)	105	105	105	95	105	105	105	105	105	105	110	110	110	110	105	105	130	
				IPT(fz)	.0011	.0011	.0009	.0009	.0010	.0010	.0010	.0008	.0008	.0008	.0009	.0011	.0009	.0009	.0009	.0009	.0009	
				RPM	1060	1060	1060	950	790	790	790	790	790	790	740	680	680	680	530	530	500	
				IPM(FEED)	5	5	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	
	40	0.05D	2.5D	SFM(Vc)	170	170	170	150	175	175	175	175	175	175	180	175	175	175	170	170	210	
				IPT(fz)	.0013	.0013	.0011	.0011	.0013	.0013	.0013	.0012	.0012	.0012	.0011	.0014	.0012	.0012	.0011	.0010	.0011	
				RPM	1730	1730	1730	1550	1320	1320	1320	1320	1320	1320	1210	1080	1080	1080	860	860	800	
				IPM(FEED)	9	9	8	7	7	7	7	6	6	6	6	6	5	5	4	3	4	
	41	0.05D	2.5D	SFM(Vc)	105	105	105	95	105	105	105	105	105	105	110	110	110	110	105	105	130	
				IPT(fz)	.0011	.0011	.0009	.0009	.0010	.0010	.0010	.0008	.0008	.0008	.0009	.0011	.0009	.0009	.0009	.0009	.0009	
				RPM	1060	1060	1060	950	790	790	790	790	790	790	740	680	680	680	530	530	500	
				IPM(FEED)	5	5	4	3	3	3	3	3	3	3	3	3	2	2	2	2	2	



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF28 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				3/64	3/64	3/64	3/64	1/16	1/16	1/16	1/16	1/16	5/64	5/64	5/64	5/64	1/8	1/8
			LBS	5/32	3/16	1/4	5/16	1/4	5/16	3/8	1/2	5/8	5/16	3/8	1/2	5/8	3/8	1/2
P	1-8	Non-alloy steel Low alloy steel	SFM(Vc)	240	240	215	215	265	265	235	235	235	285	285	260	260	330	330
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	19650	19650	17690	17690	16060	16060	14460	14460	14460	14010	14010	12610	12610	10110	10110
			IPM(FEED)	12	12	10	10	12	12	10	10	10	13	13	11	11	14	14
			Ae	.0007	.0007	.0004	.0004	.0009	.0009	.0005	.0005	.0003	.0011	.0011	.0007	.0007	.0026	.0019
	9	Low alloy steel	SFM(Vc)	150	150	135	135	165	165	150	150	150	185	185	170	170	205	205
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	12200	12200	10980	10980	10110	10110	9100	9100	9100	9140	9140	8230	8230	6300	6300
			IPM(FEED)	7	7	6	6	7	7	6	6	6	8	8	7	7	9	9
			Ae	.0005	.0005	.0003	.0003	.0007	.0007	.0004	.0004	.0002	.0009	.0009	.0005	.0005	.002	.0014
	10	High alloyed steel, and tool steel	SFM(Vc)	240	240	215	215	265	265	235	235	235	285	285	260	260	330	330
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	19650	19650	17690	17690	16060	16060	14460	14460	14460	14010	14010	12610	12610	10110	10110
			IPM(FEED)	12	12	10	10	12	12	10	10	10	13	13	11	11	14	14
			Ae	.0007	.0007	.0004	.0004	.0009	.0009	.0005	.0005	.0003	.0011	.0011	.0007	.0007	.0026	.0019
	11.1-11.2		SFM(Vc)	150	150	135	135	165	165	150	150	150	185	185	170	170	205	205
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	12200	12200	10980	10980	10110	10110	9100	9100	9100	9140	9140	8230	8230	6300	6300
			IPM(FEED)	7	7	6	6	7	7	6	6	6	8	8	7	7	9	9
			Ae	.0005	.0005	.0003	.0003	.0007	.0007	.0004	.0004	.0002	.0009	.0009	.0005	.0005	.002	.0014
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	240	240	215	215	265	265	235	235	235	285	285	260	260	330	330
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	19650	19650	17690	17690	16060	16060	14460	14460	14460	14010	14010	12610	12610	10110	10110
			IPM(FEED)	12	12	10	10	12	12	10	10	10	13	13	11	11	14	14
			Ae	.0007	.0007	.0004	.0004	.0009	.0009	.0005	.0005	.0003	.0011	.0011	.0007	.0007	.0026	.0019
H	38.1-38.2	Hardened steel	SFM(Vc)	95	95	85	85	100	100	90	90	90	125	125	110	110	125	125
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
			RPM	7560	7560	6800	6800	6140	6140	5530	5530	5530	6050	6050	5440	5440	3810	3810
			IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
			Ae	.004	.004	.002	.002	.006	.006	.003	.003	.002	.007	.007	.004	.004	.016	.011
	40	Chilled Cast Iron	SFM(Vc)	150	150	135	135	165	165	150	150	150	185	185	170	170	205	205
			IPT(fz)	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004
			RPM	12200	12200	10980	10980	10110	10110	9100	9100	9100	9140	9140	8230	8230	6300	6300
			IPM(FEED)	7	7	6	6	7	7	6	6	6	8	8	7	7	9	9
			Ae	.0005	.0005	.0003	.0003	.0007	.0007	.0004	.0004	.0002	.0009	.0009	.0005	.0005	.002	.0014
	41	Hardened Cast Iron	SFM(Vc)	95	95	85	85	100	100	90	90	90	125	125	110	110	125	125
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
			RPM	7560	7560	6800	6800	6140	6140	5530	5530	5530	6050	6050	5440	5440	3810	3810
			IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
			Ae	.004	.004	.002	.002	.006	.006	.003	.003	.002	.007	.007	.004	.004	.016	.011

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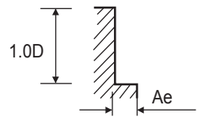
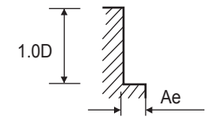


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

GMF28 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)															
			1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	13/64	13/64	1/4	1/4	5/16	5/16	3/8	3/8	1/2	1/2
		LBS	5/8	3/4	1-3/16	1/2	5/8	3/4	1-3/16	1-1/2	3/4	1-1/2	5/8	1-3/16	1	1-5/8	1-3/16	1-3/4	1-3/8	2
P	1-8	SFM(Vc)	330	300	300	375	375	375	335	335	390	350	410	410	415	375	400	400	410	410
		IPT(fz)	.0004	.0003	.0003	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0012	.0012	.0017	.0015	.0018	.0018	.0018	.0018
		RPM	10110	9100	9100	7620	7620	7620	6860	6860	7330	6590	6300	6300	5080	4570	4100	4100	3120	3120
		IPM(FEED)	14	11	11	22	22	22	18	18	28	22	29	29	34	27	30	30	23	23
		Ae	.0019	.0011	.0007	.0039	.0028	.0028	.0016	.0016	.003	.0017	.0052	.0037	.0046	.0026	.0055	.0055	.0105	.0074
	9	SFM(Vc)	205	185	185	230	230	230	205	205	235	210	250	250	250	225	245	245	250	250
		IPT(fz)	.0004	.0003	.0003	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0012	.0012	.0015	.0013	.0015	.0015	.0015	.0015
		RPM	6300	5670	5670	4650	4650	4650	4190	4190	4390	3950	3810	3810	3040	2740	2520	2520	1900	1900
		IPM(FEED)	9	7	7	14	14	14	11	11	16	13	18	18	18	14	15	15	11	11
		Ae	.0014	.0008	.0005	.003	.0021	.0021	.0012	.0012	.0022	.0013	.0039	.0028	.0035	.002	.0041	.0041	.0079	.0055
	10	SFM(Vc)	330	300	300	375	375	375	335	335	390	350	410	410	415	375	400	400	410	410
		IPT(fz)	.0004	.0003	.0003	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0012	.0012	.0017	.0015	.0018	.0018	.0018	.0018
		RPM	10110	9100	9100	7620	7620	7620	6860	6860	7330	6590	6300	6300	5080	4570	4100	4100	3120	3120
		IPM(FEED)	14	11	11	22	22	22	18	18	28	22	29	29	34	27	30	30	23	23
		Ae	.0019	.0011	.0007	.0039	.0028	.0028	.0016	.0016	.003	.0017	.0052	.0037	.0046	.0026	.0055	.0055	.0105	.0074
	11.1-11.2	SFM(Vc)	205	185	185	230	230	230	205	205	235	210	250	250	250	225	245	245	250	250
		IPT(fz)	.0004	.0003	.0003	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0012	.0012	.0015	.0013	.0015	.0015	.0015	.0015
		RPM	6300	5670	5670	4650	4650	4650	4190	4190	4390	3950	3810	3810	3040	2740	2520	2520	1900	1900
		IPM(FEED)	9	7	7	14	14	14	11	11	16	13	18	18	18	14	15	15	11	11
		Ae	.0014	.0008	.0005	.003	.0021	.0021	.0012	.0012	.0022	.0013	.0039	.0028	.0035	.002	.0041	.0041	.0079	.0055
K	15-20	SFM(Vc)	330	300	300	375	375	375	335	335	390	350	410	410	415	375	400	400	410	410
		IPT(fz)	.0004	.0003	.0003	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0012	.0012	.0017	.0015	.0018	.0018	.0018	.0018
		RPM	10110	9100	9100	7620	7620	7620	6860	6860	7330	6590	6300	6300	5080	4570	4100	4100	3120	3120
		IPM(FEED)	14	11	11	22	22	22	18	18	28	22	29	29	34	27	30	30	23	23
		Ae	.0019	.0011	.0007	.0039	.0028	.0028	.0016	.0016	.003	.0017	.0052	.0037	.0046	.0026	.0055	.0055	.0105	.0074
H	38.1-38.2	SFM(Vc)	125	110	110	145	145	145	130	130	145	130	150	150	165	150	170	170	175	175
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004	.0006	.0006	.0006	.0006	.0007	.0007
		RPM	3810	3430	3430	2960	2960	2960	2670	2670	2690	2420	2270	2270	2030	1820	1710	1710	1320	1320
		IPM(FEED)	3	2	2	2	2	2	2	2	3	3	4	4	5	4	4	4	4	4
		Ae	.011	.006	.004	.024	.017	.017	.009	.009	.018	.010	.031	.022	.028	.016	.033	.033	.063	.044
	40	SFM(Vc)	205	185	185	230	230	230	205	205	235	210	250	250	250	225	245	245	250	250
		IPT(fz)	.0004	.0003	.0003	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0012	.0012	.0015	.0013	.0015	.0015	.0015	.0015
		RPM	6300	5670	5670	4650	4650	4650	4190	4190	4390	3950	3810	3810	3040	2740	2520	2520	1900	1900
		IPM(FEED)	9	7	7	14	14	14	11	11	16	13	18	18	18	14	15	15	11	11
		Ae	.0014	.0008	.0005	.003	.0021	.0021	.0012	.0012	.0022	.0013	.0039	.0028	.0035	.002	.0041	.0041	.0079	.0055
	41	SFM(Vc)	125	110	110	145	145	145	130	130	145	130	150	150	165	150	170	170	175	175
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004	.0006	.0006	.0006	.0006	.0007	.0007
		RPM	3810	3430	3430	2960	2960	2960	2670	2670	2690	2420	2270	2270	2030	1820	1710	1710	1320	1320
		IPM(FEED)	3	2	2	2	2	2	2	2	3	3	4	4	5	4	4	4	4	4
		Ae	.011	.006	.004	.024	.017	.017	.009	.009	.018	.010	.031	.022	.028	.016	.033	.033	.063	.044



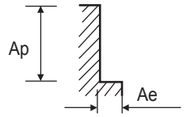
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF29 SERIES — 6 FLUTE 45° HELIX - SIDE CUTTING (NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/4	1/4	5/16	5/16	3/8	3/8	1/2	1/2	5/8	5/8	3/4	3/4
					LOC	5/8	1-3/16	3/4	1-1/2	1	1-1/2	1-3/16	2	1-1/2	2-3/8	1-3/4	2-3/8
P	1-8	Non-alloy steel	0.1D	1.5D	SFM(Vc)	380	380	365	365	365	365	385	385	365	365	365	365
					IPT(fz)	.0024	.0020	.0031	.0027	.0039	.0039	.0039	.0033	.0039	.0034	.0040	.0034
					RPM	5775	5775	4440	4440	3705	3705	2950	2950	2225	2225	1850	1850
					IPM(FEED)	82	70	83	71	87	87	69	59	53	45	44	37
	9	Low alloy steel	0.05D	1.5D	SFM(Vc)	265	265	255	255	250	250	270	270	255	255	250	250
					IPT(fz)	.0023	.0020	.0031	.0026	.0039	.0039	.0038	.0032	.0039	.0033	.0039	.0033
					RPM	4035	4035	3110	3110	2560	2560	2080	2080	1565	1565	1280	1280
					IPM(FEED)	56	48	57	49	60	60	47	40	37	31	30	25
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	380	380	365	365	365	365	385	385	365	365	365	365
					IPT(fz)	.0024	.0020	.0031	.0027	.0039	.0039	.0039	.0033	.0039	.0034	.0040	.0034
					RPM	5775	5775	4440	4440	3705	3705	2950	2950	2225	2225	1850	1850
					IPM(FEED)	82	70	83	71	87	87	69	59	53	45	44	37
	11.1-11.2		0.05D	1.5D	SFM(Vc)	265	265	255	255	250	250	270	270	255	255	250	250
					IPT(fz)	.0023	.0020	.0031	.0026	.0039	.0039	.0038	.0032	.0039	.0033	.0039	.0033
					RPM	4035	4035	3110	3110	2560	2560	2080	2080	1565	1565	1280	1280
					IPM(FEED)	56	48	57	49	60	60	47	40	37	31	30	25
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	380	380	365	365	365	365	385	385	365	365	365	365
					IPT(fz)	.0024	.0020	.0031	.0027	.0039	.0039	.0039	.0033	.0039	.0034	.0040	.0034
					RPM	5775	5775	4440	4440	3705	3705	2950	2950	2225	2225	1850	1850
					IPM(FEED)	82	70	83	71	87	87	69	59	53	45	44	37
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	105	105	100	100	110	110	115	115	110	110	105	105
					IPT(fz)	.0009	.0008	.0012	.0010	.0014	.0014	.0014	.0012	.0013	.0011	.0015	.0013
					RPM	1640	1640	1230	1230	1105	1105	870	870	685	685	545	545
					IPM(FEED)	9	7	9	7	9	9	7	6	5	5	5	4
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	265	265	255	255	250	250	270	270	255	255	250	250
					IPT(fz)	.0023	.0020	.0031	.0026	.0039	.0039	.0038	.0032	.0039	.0033	.0039	.0033
					RPM	4035	4035	3110	3110	2560	2560	2080	2080	1565	1565	1280	1280
					IPM(FEED)	56	48	57	49	60	60	47	40	37	31	30	25
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	105	105	100	100	110	110	115	115	110	110	105	105
					IPT(fz)	.0009	.0008	.0012	.0010	.0014	.0014	.0014	.0012	.0013	.0011	.0015	.0013
					RPM	1640	1640	1230	1230	1105	1105	870	870	685	685	545	545
					IPM(FEED)	9	7	9	7	9	9	7	6	5	5	5	4



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

GMF29 SERIES — 6 FLUTE 45° HELIX - SIDE CUTTING (HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/4	1/4	5/16	5/16	3/8	3/8	1/2	1/2	5/8	5/8	3/4	3/4
					LOC	5/8	1-3/16	3/4	1-1/2	1	1-1/2	1-3/16	2	1-1/2	2-3/8	1-3/4	2-3/8
P	9	Non-alloy steel	0.05D	1.5D	SFM(Vc)	1140	1140	1090	1090	1080	1080	1145	1145	1090	1090	1090	1090
					IPT(fz)	.0024	.0020	.0032	.0027	.0039	.0039	.0039	.0034	.0039	.0034	.0040	.0034
					RPM	17455	17455	13335	13335	11005	11005	8735	8735	6670	6670	5555	5555
					IPM(FEED)	249	212	254	216	260	260	206	175	158	134	132	112
	11.1-11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1140	1140	1090	1090	1080	1080	1145	1145	1090	1090	1090	1090
					IPT(fz)	.0024	.0020	.0032	.0027	.0039	.0039	.0039	.0034	.0039	.0034	.0040	.0034
					RPM	17455	17455	13335	13335	11005	11005	8735	8735	6670	6670	5555	5555
					IPM(FEED)	249	212	254	216	260	260	206	175	158	134	132	112
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	570	570	545	545	545	545	570	570	545	545	545	545
					IPT(fz)	.0024	.0020	.0032	.0027	.0040	.0040	.0039	.0034	.0039	.0033	.0038	.0032
					RPM	8735	8735	6670	6670	5555	5555	4365	4365	3340	3340	2785	2785
					IPM(FEED)	125	106	127	108	132	132	103	88	79	67	64	54
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1140	1140	1090	1090	1080	1080	1145	1145	1090	1090	1090	1090
					IPT(fz)	.0024	.0020	.0032	.0027	.0039	.0039	.0039	.0034	.0039	.0034	.0040	.0034
					RPM	17455	17455	13335	13335	11005	11005	8735	8735	6670	6670	5555	5555
					IPM(FEED)	249	212	254	216	260	260	206	175	158	134	132	112
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	570	570	545	545	545	545	570	570	545	545	545	545
					IPT(fz)	.0024	.0020	.0032	.0027	.0040	.0040	.0039	.0034	.0039	.0033	.0038	.0032
					RPM	8735	8735	6670	6670	5555	5555	4365	4365	3340	3340	2785	2785
					IPM(FEED)	125	106	127	108	132	132	103	88	79	67	64	54

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

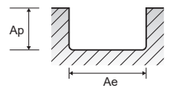
4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

G907, G928, G908, G929, G909, G930 SERIES

4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
					IPM(FEED)	61	65	65	61	59	52	46
	3-5		1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
					IPM(FEED)	43	47	47	45	41	35	33
	6	Low alloy steel	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
					IPM(FEED)	61	65	65	61	59	52	46
	7-9		1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
					IPM(FEED)	43	47	47	45	41	35	33
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
					IPM(FEED)	61	65	65	61	59	52	46
	11.1-11.2		1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
					IPM(FEED)	43	47	47	45	41	35	33
K	15	Grey cast iron	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
					IPM(FEED)	61	65	65	61	59	52	46
	16		1.0D	1.0D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
					IPM(FEED)	43	47	47	45	41	35	33
	17	Nodular cast iron	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
					IPM(FEED)	61	65	65	61	59	52	46
	18		1.0D	1.0D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
					IPM(FEED)	43	47	47	45	41	35	33
	19-20	Malleable cast iron	1.0D	1.0D	SFM(Vc)	785	735	705	785	735	705	760
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029	.0032
					RPM	12000	9000	7200	6000	4500	3600	2900
					IPM(FEED)	61	65	65	61	59	52	46
H	40	Chilled Cast Iron	1.0D	0.8D	SFM(Vc)	695	665	630	705	670	630	680
					IPT(fz)	.0010	.0014	.0018	.0021	.0020	.0022	.0025
					RPM	10600	8100	6400	5400	4100	3200	2600
					IPM(FEED)	43	47	47	45	41	35	33



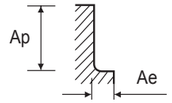
4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

G907, G928, G908, G929, G909, G930 SERIES

4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
					IPM(FEED)	101	106	106	101	97	84	75
	3-5		0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029
					RPM	14300	10700	8500	7100	5400	4300	3400
					IPM(FEED)	73	77	77	73	70	59	49
	6	Low alloy steel	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
					IPM(FEED)	101	106	106	101	97	84	75
	7-9		0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029
					RPM	14300	10700	8500	7100	5400	4300	3400
					IPM(FEED)	73	77	77	73	70	59	49
	10	High alloyed steel, and tool steel	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
					IPM(FEED)	101	106	106	101	97	84	75
	11.1-11.2		0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029
					RPM	14300	10700	8500	7100	5400	4300	3400
					IPM(FEED)	73	77	77	73	70	59	49
K	15	Grey cast iron	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
					IPM(FEED)	101	106	106	101	97	84	75
	16		0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029
					RPM	14300	10700	8500	7100	5400	4300	3400
					IPM(FEED)	73	77	77	73	70	59	49
	17	Nodular cast iron	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
					IPM(FEED)	101	106	106	101	97	84	75
	18		0.35D	1.0D	SFM(Vc)	935	875	835	930	885	845	890
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028	.0029
					RPM	14300	10700	8500	7100	5400	4300	3400
					IPM(FEED)	73	77	77	73	70	59	49
	19-20	Malleable cast iron	0.5D	1.0D	SFM(Vc)	1035	975	935	1045	980	940	995
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035	.0040
					RPM	15800	11900	9500	8000	6000	4800	3800
					IPM(FEED)	101	106	106	101	97	84	75



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEMD98 SERIES — 2 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5
P	1-8	Non-alloy steel	0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	310	370	465	615	615
					IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0015	.0017	.0019	.0020	.0021	.0023	.0029
					RPM	40000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	29820	23800
					IPM(FEED)	22	28	35	45	57	69	80	92	103	113	120	128	135	138
	9	Low alloy steel	0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	310	355	445	590	590
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0017	.0018	.0018	.0020	.0026
					RPM	40000	30000	30000	30000	30000	30000	30000	30000	30000	30000	28800	28800	28680	22900
					IPM(FEED)	20	25	32	40	50	59	69	78	89	99	102	106	113	119
	10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	310	370	465	615	615
					IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0015	.0017	.0019	.0020	.0021	.0023	.0029
					RPM	40000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	29820	23800
					IPM(FEED)	22	28	35	45	57	69	80	92	103	113	120	128	135	138
	11.2		0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	310	355	445	590	590
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0017	.0018	.0018	.0020	.0026
					RPM	40000	30000	30000	30000	30000	30000	30000	30000	30000	30000	28800	28800	28680	22900
					IPM(FEED)	20	25	32	40	50	59	69	78	89	99	102	106	113	119
K	15	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	310	370	465	615	615
					IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0015	.0017	.0019	.0020	.0021	.0023	.0029
					RPM	40000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	30000	29820	23800
					IPM(FEED)	22	28	35	45	57	69	80	92	103	113	120	128	135	138
H	38.1-38.2	Hardened steel	0.08D	0.05D	SFM(Vc)	35	55	85	110	140	165	195	225	250	280	320	400	495	495
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0017	.0018	.0018	.0020	.0025
					RPM	33000	27000	27000	27000	27000	27000	27000	27000	27000	27000	25800	25800	24000	19200
					IPM(FEED)	16	23	28	35	45	52	61	71	80	90	91	94	94	94
	40	Chilled Cast Iron	0.08D	0.05D	SFM(Vc)	40	60	95	125	155	185	215	245	280	310	355	445	590	590
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0017	.0018	.0018	.0020	.0026
					RPM	40000	30000	30000	30000	30000	30000	30000	30000	30000	30000	28800	28800	28680	22900
					IPM(FEED)	20	25	32	40	50	59	69	78	89	99	102	106	113	119
	41	Hardened Cast Iron	0.08D	0.05D	SFM(Vc)	35	55	85	110	140	165	195	225	250	280	320	400	495	495
					IPT(fz)	.0002	.0004	.0005	.0007	.0008	.0010	.0011	.0013	.0015	.0017	.0018	.0018	.0020	.0025
					RPM	33000	27000	27000	27000	27000	27000	27000	27000	27000	27000	25800	25800	24000	19200
					IPM(FEED)	16	23	28	35	45	52	61	71	80	90	91	94	94	94

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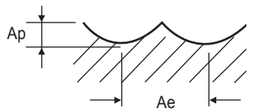

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEMD98 SERIES — 2 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	8.0	8.5	9.0	10.0
P	1-8	Non-alloy steel	0.08D	0.05D	SFM(Vc)	615	615	615	605	575	555	515	520	520	550	550	550	575
					IPT(fz)	.0036	.0042	.0048	.0053	.0061	.0065	.0069	.0070	.0072	.0074	.0076	.0077	.0078
					RPM	19860	17000	14900	13030	11160	9750	8340	7780	7220	6660	6300	5940	5580
					IPM(FEED)	142	142	142	139	137	126	115	109	104	99	95	91	87
	9	Low alloy steel	0.08D	0.05D	SFM(Vc)	590	590	590	580	550	530	495	500	500	530	530	530	550
					IPT(fz)	.0033	.0038	.0044	.0048	.0054	.0057	.0060	.0061	.0063	.0064	.0066	.0067	.0069
					RPM	19080	16400	14340	12510	10680	9360	8040	7500	6960	6420	6060	5700	5340
					IPM(FEED)	125	125	125	120	116	106	97	92	87	83	80	76	73
	10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	SFM(Vc)	615	615	615	605	575	555	515	520	520	550	550	550	575
					IPT(fz)	.0036	.0042	.0048	.0053	.0061	.0065	.0069	.0070	.0072	.0074	.0076	.0077	.0078
					RPM	19860	17000	14900	13030	11160	9750	8340	7780	7220	6660	6300	5940	5580
					IPM(FEED)	142	142	142	139	137	126	115	109	104	99	95	91	87
	11.2		0.08D	0.05D	SFM(Vc)	590	590	590	580	550	530	495	500	500	530	530	530	550
					IPT(fz)	.0033	.0038	.0044	.0048	.0054	.0057	.0060	.0061	.0063	.0064	.0066	.0067	.0069
					RPM	19080	16400	14340	12510	10680	9360	8040	7500	6960	6420	6060	5700	5340
					IPM(FEED)	125	125	125	120	116	106	97	92	87	83	80	76	73
K	15	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	SFM(Vc)	615	615	615	605	575	555	515	520	520	550	550	550	575
					IPT(fz)	.0036	.0042	.0048	.0053	.0061	.0065	.0069	.0070	.0072	.0074	.0076	.0077	.0078
					RPM	19860	17000	14900	13030	11160	9750	8340	7780	7220	6660	6300	5940	5580
					IPM(FEED)	142	142	142	139	137	126	115	109	104	99	95	91	87
H	38.1-38.2	Hardened steel	0.08D	0.05D	SFM(Vc)	495	495	495	485	465	440	410	415	420	445	445	445	465
					IPT(fz)	.0030	.0034	.0039	.0044	.0049	.0052	.0055	.0057	.0058	.0059	.0060	.0062	.0063
					RPM	16000	13700	12000	10500	9000	7800	6600	6200	5800	5400	5100	4800	4500
					IPM(FEED)	94	94	94	92	89	81	73	70	67	64	61	59	57
	40	Chilled Cast Iron	0.08D	0.05D	SFM(Vc)	590	590	590	580	550	530	495	500	500	530	530	530	550
					IPT(fz)	.0033	.0038	.0044	.0048	.0054	.0057	.0060	.0061	.0063	.0064	.0066	.0067	.0069
					RPM	19080	16400	14340	12510	10680	9360	8040	7500	6960	6420	6060	5700	5340
					IPM(FEED)	125	125	125	120	116	106	97	92	87	83	80	76	73
	41	Hardened Cast Iron	0.08D	0.05D	SFM(Vc)	495	495	495	485	465	440	410	415	420	445	445	445	465
					IPT(fz)	.0030	.0034	.0039	.0044	.0049	.0052	.0055	.0057	.0058	.0059	.0060	.0062	.0063
					RPM	16000	13700	12000	10500	9000	7800	6600	6200	5800	5400	5100	4800	4500
					IPM(FEED)	94	94	94	92	89	81	73	70	67	64	61	59	57

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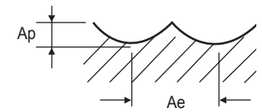


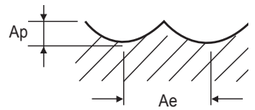
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEMD98 SERIES — 2 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 11.0	12.0	13.0	14.0	15.0	16.0	18.0	20.0	25.0
P	1-8	Non-alloy steel	0.08D	0.05D	SFM(Vc)	555	515	530	540	550	550	555	550	550
					IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106
					RPM	4875	4170	3960	3750	3550	3340	3005	2670	2130
					IPM(FEED)	79	70	68	66	64	63	59	56	45
	9	Low alloy steel	0.08D	0.05D	SFM(Vc)	530	495	510	520	525	530	535	530	530
					IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091
					RPM	4670	4000	3800	3600	3400	3210	2895	2580	2060
					IPM(FEED)	66	59	59	59	59	52	49	46	37
	10-11.1	High alloyed steel, and tool steel	0.08D	0.05D	SFM(Vc)	555	515	530	540	550	550	555	550	550
					IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106
					RPM	4875	4170	3960	3750	3550	3340	3005	2670	2130
					IPM(FEED)	79	70	68	66	64	63	59	56	45
	11.2		0.08D	0.05D	SFM(Vc)	530	495	510	520	525	530	535	530	530
					IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091
					RPM	4670	4000	3800	3600	3400	3210	2895	2580	2060
					IPM(FEED)	66	59	59	59	59	52	49	46	37
K	15	Grey cast iron Nodular cast iron Malleable cast iron	0.08D	0.05D	SFM(Vc)	555	515	530	540	550	550	555	550	550
					IPT(fz)	.0081	.0084	.0086	.0088	.0091	.0094	.0098	.0104	.0106
					RPM	4875	4170	3960	3750	3550	3340	3005	2670	2130
					IPM(FEED)	79	70	68	66	64	63	59	56	45
H	38.1-38.2	Hardened steel	0.08D	0.05D	SFM(Vc)	445	415	430	435	445	445	450	445	445
					IPT(fz)	.0065	.0067	.0068	.0070	.0072	.0074	.0078	.0082	.0083
					RPM	3930	3360	3200	3030	2870	2700	2430	2160	1730
					IPM(FEED)	51	45	44	43	41	40	38	35	29
	40	Chilled Cast Iron	0.08D	0.05D	SFM(Vc)	530	495	510	520	525	530	535	530	530
					IPT(fz)	.0071	.0074	.0078	.0082	.0087	.0081	.0085	.0089	.0091
					RPM	4670	4000	3800	3600	3400	3210	2895	2580	2060
					IPM(FEED)	66	59	59	59	59	52	49	46	37
	41	Hardened Cast Iron	0.08D	0.05D	SFM(Vc)	445	415	430	435	445	445	450	445	445
					IPT(fz)	.0065	.0067	.0068	.0070	.0072	.0074	.0078	.0082	.0083
					RPM	3930	3360	3200	3030	2870	2700	2430	2160	1730
					IPM(FEED)	51	45	44	43	41	40	38	35	29



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
			LBS	0.2	0.3	0.5	1	0.5	1	1.5	2	3	1	1.5	2	2.5	3	4	5	1
P	1-8	Non-alloy steel	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	170
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	41000
			IPM(FEED)	9	9	9	8	13	13	11	11	11	19	19	15	15	15	12	8	19
			Ap	.0004	.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0001	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014
	9	Low alloy steel	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	160
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	38800
			IPM(FEED)	8	8	8	7	12	12	10	10	10	17	17	14	14	14	11	7	17
			Ap	.0003	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0001	.0006	.0006	.0003	.0002	.0002	.0001	.0001	.0011
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	170
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	41000
			IPM(FEED)	9	9	9	8	13	13	11	11	11	19	19	15	15	15	12	8	19
			Ap	.0004	.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0001	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014
	11.2		SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	160
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	38800
			IPM(FEED)	8	8	8	7	12	12	10	10	10	17	17	14	14	14	11	7	17
			Ap	.0003	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0001	.0006	.0006	.0003	.0002	.0002	.0001	.0001	.0011
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	170
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	41000
			IPM(FEED)	9	9	9	8	13	13	11	11	11	19	19	15	15	15	12	8	19
			Ap	.0004	.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0001	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014
H	38.1-38.2	Hardened steel	SFM(Vc)	50	50	50	45	90	90	80	80	80	130	130	120	120	120	105	80	140
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	43200	43200	38880	38880	38880	42800	42800	38520	38520	38520	34240	25680	34200
			IPM(FEED)	7.5	7.5	7.5	6.1	10.2	10.2	8.3	8.3	8.3	14.4	14.4	11.6	11.6	11.6	9.3	6.1	13.4
			Ap	.0002	.0002	.0002	.0000	.0004	.0003	.0002	.0001	.0001	.0004	.0004	.0002	.0002	.0002	.0001	.0001	.0008
	40	Chilled Cast Iron	SFM(Vc)	50	50	50	45	105	105	95	95	95	155	155	140	140	140	125	95	160
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	50000	50000	45000	45000	45000	50000	50000	45000	45000	45000	40000	30000	38800
			IPM(FEED)	8	8	8	7	12	12	10	10	10	17	17	14	14	14	11	7	17
			Ap	.0003	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0001	.0006	.0006	.0003	.0002	.0002	.0001	.0001	.0011
	41	Hardened Cast Iron	SFM(Vc)	50	50	50	45	90	90	80	80	80	130	130	120	120	120	105	80	140
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002
			RPM	50000	50000	50000	45000	43200	43200	38880	38880	38880	42800	42800	38520	38520	38520	34240	25680	34200
			IPM(FEED)	7.5	7.5	7.5	6.1	10.2	10.2	8.3	8.3	8.3	14.4	14.4	11.6	11.6	11.6	9.3	6.1	13.4
			Ap	.0002	.0002	.0002	.0000	.0004	.0003	.0002	.0001	.0001	.0004	.0004	.0002	.0002	.0002	.0001	.0001	.0008

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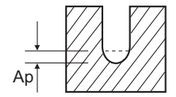
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
			LBS	1.5	2	2.5	3	4	5	6	8	10	1	1.5	2	2.5	3	4	5	6
P	1-8	Non-alloy steel	SFM(Vc)	170	170	150	150	150	135	135	100	50	175	175	175	175	160	160	160	140
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	41000	41000	36900	36900	36900	32800	32800	24600	12300	34200	34200	34200	34200	30780	30780	30780	27360
			IPM(FEED)	19	19	16	16	16	12	12	8	4	27	27	27	27	22	22	22	17
			Ap	.0010	.0010	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0018	.0018	.0013	.0013	.0007	.0007	.0004	.0004
	9	Low alloy steel	SFM(Vc)	160	160	145	145	145	130	130	95	50	165	165	165	165	150	150	150	135
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	38800	38800	34920	34920	34920	31040	31040	23280	11640	32300	32300	32300	32300	29070	29070	29070	25840
			IPM(FEED)	17	17	14	14	14	11	11	7	3	23	23	23	23	19	19	19	15
			Ap	.0008	.0008	.0004	.0004	.0003	.0003	.0002	.0001	.0001	.0014	.0014	.0010	.0010	.0006	.0006	.0004	.0004
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	170	170	150	150	150	135	135	100	50	175	175	175	175	160	160	160	140
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	41000	41000	36900	36900	36900	32800	32800	24600	12300	34200	34200	34200	34200	30780	30780	30780	27360
			IPM(FEED)	19	19	16	16	16	12	12	8	4	27	27	27	27	22	22	22	17
			Ap	.0010	.0010	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0018	.0018	.0013	.0013	.0007	.0007	.0004	.0004
	11.2		SFM(Vc)	160	160	145	145	145	130	130	95	50	165	165	165	165	150	150	150	135
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	38800	38800	34920	34920	34920	31040	31040	23280	11640	32300	32300	32300	32300	29070	29070	29070	25840
			IPM(FEED)	17	17	14	14	14	11	11	7	3	23	23	23	23	19	19	19	15
			Ap	.0008	.0008	.0004	.0004	.0003	.0003	.0002	.0001	.0001	.0014	.0014	.0010	.0010	.0006	.0006	.0004	.0004
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	170	170	150	150	150	135	135	100	50	175	175	175	175	160	160	160	140
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003
			RPM	41000	41000	36900	36900	36900	32800	32800	24600	12300	34200	34200	34200	34200	30780	30780	30780	27360
			IPM(FEED)	19	19	16	16	16	12	12	8	4	27	27	27	27	22	22	22	17
			Ap	.0010	.0010	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0018	.0018	.0013	.0013	.0007	.0007	.0004	.0004
H	38.1-38.2	Hardened steel	SFM(Vc)	140	140	125	125	125	115	115	85	40	145	145	145	145	130	130	130	115
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	34200	34200	30780	30780	30780	27360	27360	20520	10260	28500	28500	28500	28500	25650	25650	25650	22800
			IPM(FEED)	13.4	13.4	10.8	10.8	10.8	8.7	8.7	5.7	2.4	20.3	20.3	20.3	20.3	16.3	16.3	16.3	13.0
			Ap	.0006	.0006	.0003	.0003	.0002	.0002	.0001	.0001	.0001	.0010	.0010	.0007	.0007	.0004	.0004	.0002	.0002
	40	Chilled Cast Iron	SFM(Vc)	160	160	145	145	145	130	130	95	50	165	165	165	165	150	150	150	135
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	38800	38800	34920	34920	34920	31040	31040	23280	11640	32300	32300	32300	32300	29070	29070	29070	25840
			IPM(FEED)	17	17	14	14	14	11	11	7	3	23	23	23	23	19	19	19	15
			Ap	.0008	.0008	.0004	.0004	.0003	.0003	.0002	.0001	.0001	.0014	.0014	.0010	.0010	.0006	.0006	.0004	.0004
	41	Hardened Cast Iron	SFM(Vc)	140	140	125	125	125	115	115	85	40	145	145	145	145	130	130	130	115
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	34200	34200	30780	30780	30780	27360	27360	20520	10260	28500	28500	28500	28500	25650	25650	25650	22800
			IPM(FEED)	13.4	13.4	10.8	10.8	10.8	8.7	8.7	5.7	2.4	20.3	20.3	20.3	20.3	16.3	16.3	16.3	13.0
			Ap	.0006	.0006	.0003	.0003	.0002	.0002	.0001	.0001	.0001	.0010	.0010	.0007	.0007	.0004	.0004	.0002	.0002

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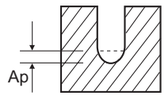
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																			
			0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
		LBS	8	10	12	14	16	1	2	3	4	5	6	8	10	12	14	16	2	4	6	8
P	1-8	SFM(Vc)	105	105	55	55	20	210	210	210	190	190	190	170	125	125	65	65	245	220	220	195
		IPT(fz)	.0003	.0003	.0002	.0002	.0002	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0006	.0006	.0006	.0005
		RPM	20520	20520	10260	10260	3420	34200	34200	34200	30780	30780	30780	27360	20520	20520	10260	10260	34200	30780	30780	27360
		IPM(FEED)	11	11	5	5	1	40	40	40	33	33	33	26	17	17	7	7	44	36	36	29
		Ap	.0003	.0002	.0002	.0002	.0002	.0015	.0015	.0015	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0002	.0025	.0010	.0006	.0006
	9	SFM(Vc)	100	100	50	50	15	200	200	200	180	180	180	160	120	120	60	60	235	210	210	185
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0003	.0006	.0005	.0005	.0005
		RPM	19380	19380	9690	9690	3230	32300	32300	32300	29070	29070	29070	25840	19380	19380	9690	9690	32300	29070	29070	25840
		IPM(FEED)	10	10	4	4	1	33	33	33	27	27	27	21	14	14	6	6	37	30	30	23
		Ap	.0002	.0002	.0002	.0002	.0002	.0011	.0011	.0011	.0007	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0019	.0008	.0005	.0005
	10-11.1	SFM(Vc)	105	105	55	55	20	210	210	210	190	190	190	170	125	125	65	65	245	220	220	195
		IPT(fz)	.0003	.0003	.0002	.0002	.0002	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0006	.0006	.0006	.0005
		RPM	20520	20520	10260	10260	3420	34200	34200	34200	30780	30780	30780	27360	20520	20520	10260	10260	34200	30780	30780	27360
		IPM(FEED)	11	11	5	5	1	40	40	40	33	33	33	26	17	17	7	7	44	36	36	29
		Ap	.0003	.0002	.0002	.0002	.0002	.0015	.0015	.0015	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0002	.0025	.0010	.0006	.0006
	11.2	SFM(Vc)	100	100	50	50	15	200	200	200	180	180	180	160	120	120	60	60	235	210	210	185
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0003	.0006	.0005	.0005	.0005
		RPM	19380	19380	9690	9690	3230	32300	32300	32300	29070	29070	29070	25840	19380	19380	9690	9690	32300	29070	29070	25840
		IPM(FEED)	10	10	4	4	1	33	33	33	27	27	27	21	14	14	6	6	37	30	30	23
		Ap	.0002	.0002	.0002	.0002	.0002	.0011	.0011	.0011	.0007	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0019	.0008	.0005	.0005
K	15-20	SFM(Vc)	105	105	55	55	20	210	210	210	190	190	190	170	125	125	65	65	245	220	220	195
		IPT(fz)	.0003	.0003	.0002	.0002	.0002	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0006	.0006	.0006	.0005
		RPM	20520	20520	10260	10260	3420	34200	34200	34200	30780	30780	30780	27360	20520	20520	10260	10260	34200	30780	30780	27360
		IPM(FEED)	11	11	5	5	1	40	40	40	33	33	33	26	17	17	7	7	44	36	36	29
		Ap	.0003	.0002	.0002	.0002	.0002	.0015	.0015	.0015	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0002	.0025	.0010	.0006	.0006
H	38.1-38.2	SFM(Vc)	90	90	45	45	15	175	175	175	160	160	160	140	105	105	55	55	205	185	185	165
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004
		RPM	17100	17100	8550	8550	2850	28500	28500	28500	25650	25650	25650	22800	17100	17100	8550	8550	28500	25650	25650	22800
		IPM(FEED)	8.5	8.5	3.7	3.7	1.0	27.0	27.0	27.0	21.9	21.9	21.9	17.3	11.4	11.4	4.9	4.9	30.1	24.4	24.4	19.3
		Ap	.0002	.0001	.0001	.0001	.0001	.0008	.0008	.0008	.0005	.0003	.0003	.0002	.0001	.0001	.0001	.0001	.0014	.0006	.0004	.0004
	40	SFM(Vc)	100	100	50	50	15	200	200	200	180	180	180	160	120	120	60	60	235	210	210	185
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0003	.0006	.0005	.0005	.0005
		RPM	19380	19380	9690	9690	3230	32300	32300	32300	29070	29070	29070	25840	19380	19380	9690	9690	32300	29070	29070	25840
		IPM(FEED)	10	10	4	4	1	33	33	33	27	27	27	21	14	14	6	6	37	30	30	23
		Ap	.0002	.0002	.0002	.0002	.0002	.0011	.0011	.0011	.0007	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0019	.0008	.0005	.0005
	41	SFM(Vc)	90	90	45	45	15	175	175	175	160	160	160	140	105	105	55	55	205	185	185	165
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004
		RPM	17100	17100	8550	8550	2850	28500	28500	28500	25650	25650	25650	22800	17100	17100	8550	8550	28500	25650	25650	22800
		IPM(FEED)	8.5	8.5	3.7	3.7	1.0	27.0	27.0	27.0	21.9	21.9	21.9	17.3	11.4	11.4	4.9	4.9	30.1	24.4	24.4	19.3
		Ap	.0002	.0001	.0001	.0001	.0001	.0008	.0008	.0008	.0005	.0003	.0003	.0002	.0001	.0001	.0001	.0001	.0014	.0006	.0004	.0004

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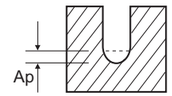
(Depth of Cut per one pass)



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9
			LBS	10	12	2	3	4	5	6	8	10	12	14	16	20	4	6	8	10
P	1-8	Non-alloy steel	SFM(Vc)	195	150	280	280	280	255	255	255	225	225	170	170	85	270	270	270	240
			IPT(fz)	.0005	.0005	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0008	.0008	.0008	.0007
			RPM	27360	20520	34200	34200	34200	30780	30780	30780	27360	27360	20520	20520	10260	29250	29250	29250	26000
			IPM(FEED)	29	19	48	48	48	39	39	39	31	31	20	20	9	44	44	44	35
			Ap	.0004	.0002	.0028	.0020	.0020	.0011	.0011	.0007	.0007	.0004	.0003	.0003	.0003	.0013	.0013	.0008	.0008
	9	Low alloy steel	SFM(Vc)	185	140	265	265	265	240	240	240	215	215	160	160	80	255	255	255	230
			IPT(fz)	.0005	.0004	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0007	.0007	.0007	.0006
			RPM	25840	19380	32300	32300	32300	29070	29070	29070	25840	25840	19380	19380	9690	27630	27630	27630	24560
			IPM(FEED)	23	15	41	41	41	33	33	33	26	26	17	17	7	37	37	37	29
			Ap	.0003	.0002	.0022	.0015	.0015	.0009	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0010	.0010	.0006	.0006
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	195	150	280	280	280	255	255	255	225	225	170	170	85	270	270	270	240
			IPT(fz)	.0005	.0005	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0008	.0008	.0008	.0007
			RPM	27360	20520	34200	34200	34200	30780	30780	30780	27360	27360	20520	20520	10260	29250	29250	29250	26000
			IPM(FEED)	29	19	48	48	48	39	39	39	31	31	20	20	9	44	44	44	35
			Ap	.0004	.0002	.0028	.0020	.0020	.0011	.0011	.0007	.0007	.0004	.0003	.0003	.0003	.0013	.0013	.0008	.0008
	11.2		SFM(Vc)	185	140	265	265	265	240	240	240	215	215	160	160	80	255	255	255	230
			IPT(fz)	.0005	.0004	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0007	.0007	.0007	.0006
			RPM	25840	19380	32300	32300	32300	29070	29070	29070	25840	25840	19380	19380	9690	27630	27630	27630	24560
			IPM(FEED)	23	15	41	41	41	33	33	33	26	26	17	17	7	37	37	37	29
			Ap	.0003	.0002	.0022	.0015	.0015	.0009	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0010	.0010	.0006	.0006
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	195	150	280	280	280	255	255	255	225	225	170	170	85	270	270	270	240
			IPT(fz)	.0005	.0005	.0007	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0008	.0008	.0008	.0007
			RPM	27360	20520	34200	34200	34200	30780	30780	30780	27360	27360	20520	20520	10260	29250	29250	29250	26000
			IPM(FEED)	29	19	48	48	48	39	39	39	31	31	20	20	9	44	44	44	35
			Ap	.0004	.0002	.0028	.0020	.0020	.0011	.0011	.0007	.0007	.0004	.0003	.0003	.0003	.0013	.0013	.0008	.0008
H	38.1-38.2	Hardened steel	SFM(Vc)	165	125	235	235	235	210	210	210	190	190	140	140	70	225	225	225	200
			IPT(fz)	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0006	.0006	.0006	.0006
			RPM	22800	17100	28500	28500	28500	25650	25650	25650	22800	22800	17100	17100	8550	24390	24390	24390	21680
			IPM(FEED)	19.3	12.6	33.7	33.7	33.7	27.4	27.4	27.4	21.5	21.5	14.2	14.2	6.1	30.5	30.5	30.5	24.0
			Ap	.0002	.0002	.0016	.0011	.0011	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0002	.0007	.0007	.0004	.0004
	40	Chilled Cast Iron	SFM(Vc)	185	140	265	265	265	240	240	240	215	215	160	160	80	255	255	255	230
			IPT(fz)	.0005	.0004	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0007	.0007	.0007	.0006
			RPM	25840	19380	32300	32300	32300	29070	29070	29070	25840	25840	19380	19380	9690	27630	27630	27630	24560
			IPM(FEED)	23	15	41	41	41	33	33	33	26	26	17	17	7	37	37	37	29
			Ap	.0003	.0002	.0022	.0015	.0015	.0009	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0010	.0010	.0006	.0006
	41	Hardened Cast Iron	SFM(Vc)	165	125	235	235	235	210	210	210	190	190	140	140	70	225	225	225	200
			IPT(fz)	.0004	.0004	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0006	.0006	.0006	.0006
			RPM	22800	17100	28500	28500	28500	25650	25650	25650	22800	22800	17100	17100	8550	24390	24390	24390	21680
			IPM(FEED)	19.3	12.6	33.7	33.7	33.7	27.4	27.4	27.4	21.5	21.5	14.2	14.2	6.1	30.5	30.5	30.5	24.0
			Ap	.0002	.0002	.0016	.0011	.0011	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0002	.0007	.0007	.0004	.0004

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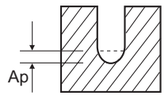
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																				
			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2
		LBS	2	3	4	5	6	7	8	10	12	14	16	18	20	22	26	30	40	50	4	6
P	1-8	SFM(Vc)	315	315	315	315	285	285	285	285	255	255	190	190	190	95	95	95	30	30	325	325
		IPT(fz)	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0010	.0010
		RPM	30800	30800	30800	30800	27720	27720	27720	27720	24640	24640	18480	18480	18480	9240	9240	9240	3080	3080	26300	26300
		IPM(FEED)	61	61	61	61	49	49	49	49	39	39	25	25	25	11	11	11	3	3	54	54
		Ap	.0035	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0006	.0006	.0004	.0004	.0004	.0004	.0004	.0004	.0002	.0030	.0030
	9	SFM(Vc)	300	300	300	300	270	270	270	270	240	240	180	180	180	90	90	90	30	30	305	305
		IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0009	.0009
		RPM	29100	29100	29100	29100	26190	26190	26190	26190	23280	23280	17460	17460	17460	8730	8730	8730	2910	2910	24800	24800
		IPM(FEED)	52	52	52	52	42	42	42	42	33	33	22	22	22	9	9	9	3	3	45	45
		Ap	.0028	.0028	.0019	.0019	.0011	.0011	.0011	.0007	.0007	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0023	.0023
	10-11.1	SFM(Vc)	315	315	315	315	285	285	285	285	255	255	190	190	190	95	95	95	30	30	325	325
		IPT(fz)	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0010	.0010
		RPM	30800	30800	30800	30800	27720	27720	27720	27720	24640	24640	18480	18480	18480	9240	9240	9240	3080	3080	26300	26300
		IPM(FEED)	61	61	61	61	49	49	49	49	39	39	25	25	25	11	11	11	3	3	54	54
		Ap	.0035	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0006	.0006	.0004	.0004	.0004	.0004	.0004	.0004	.0002	.0030	.0030
	11.2	SFM(Vc)	300	300	300	300	270	270	270	270	240	240	180	180	180	90	90	90	30	30	305	305
		IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0009	.0009
		RPM	29100	29100	29100	29100	26190	26190	26190	26190	23280	23280	17460	17460	17460	8730	8730	8730	2910	2910	24800	24800
		IPM(FEED)	52	52	52	52	42	42	42	42	33	33	22	22	22	9	9	9	3	3	45	45
		Ap	.0028	.0028	.0019	.0019	.0011	.0011	.0011	.0007	.0007	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0023	.0023
K	15-20	SFM(Vc)	315	315	315	315	285	285	285	285	255	255	190	190	190	95	95	95	30	30	325	325
		IPT(fz)	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0010	.0010
		RPM	30800	30800	30800	30800	27720	27720	27720	27720	24640	24640	18480	18480	18480	9240	9240	9240	3080	3080	26300	26300
		IPM(FEED)	61	61	61	61	49	49	49	49	39	39	25	25	25	11	11	11	3	3	54	54
		Ap	.0035	.0035	.0025	.0025	.0014	.0014	.0014	.0009	.0009	.0006	.0006	.0004	.0004	.0004	.0004	.0004	.0004	.0002	.0030	.0030
H	38.1-38.2	SFM(Vc)	265	265	265	265	240	240	240	240	210	210	160	160	160	80	80	80	25	25	270	270
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0009	.0009
		RPM	25700	25700	25700	25700	23130	23130	23130	23130	20560	20560	15420	15420	15420	7710	7710	7710	2570	2570	21900	21900
		IPM(FEED)	42.3	42.3	42.3	42.3	34.3	34.3	34.3	34.3	27.2	27.2	17.7	17.7	17.7	7.7	7.7	7.7	2.2	2.2	37.4	37.4
		Ap	.0020	.0020	.0014	.0014	.0008	.0008	.0008	.0005	.0005	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0017	.0017
	40	SFM(Vc)	300	300	300	300	270	270	270	270	240	240	180	180	180	90	90	90	30	30	305	305
		IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0009	.0009
		RPM	29100	29100	29100	29100	26190	26190	26190	26190	23280	23280	17460	17460	17460	8730	8730	8730	2910	2910	24800	24800
		IPM(FEED)	52	52	52	52	42	42	42	42	33	33	22	22	22	9	9	9	3	3	45	45
		Ap	.0028	.0028	.0019	.0019	.0011	.0011	.0011	.0007	.0007	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0023	.0023
	41	SFM(Vc)	265	265	265	265	240	240	240	240	210	210	160	160	160	80	80	80	25	25	270	270
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0009	.0009
		RPM	25700	25700	25700	25700	23130	23130	23130	23130	20560	20560	15420	15420	15420	7710	7710	7710	2570	2570	21900	21900
		IPM(FEED)	42.3	42.3	42.3	42.3	34.3	34.3	34.3	34.3	27.2	27.2	17.7	17.7	17.7	7.7	7.7	7.7	2.2	2.2	37.4	37.4
		Ap	.0020	.0020	.0014	.0014	.0008	.0008	.0008	.0005	.0005	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0017	.0017

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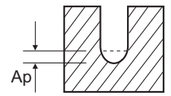
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5
			LBS	8	10	12	16	20	26	6	8	10	16	4	5	6	7	8	10	12
P	1-8	Non-alloy steel	SFM(Vc)	295	295	295	260	195	100	310	280	280	250	370	370	370	370	335	335	335
			IPT(fz)	.0009	.0009	.0009	.0008	.0007	.0006	.0012	.0011	.0011	.0009	.0013	.0013	.0013	.0013	.0012	.0012	.0012
			RPM	23670	23670	23670	21040	15780	7890	21500	19350	19350	17200	23900	23900	23900	23900	21510	21510	21510
			IPM(FEED)	44	44	44	35	23	10	51	41	41	33	62	62	62	62	50	50	50
			Ap	.0017	.0011	.0011	.0006	.0004	.0004	.0035	.0020	.0020	.0013	.0053	.0037	.0037	.0037	.0021	.0021	.0021
	9	Low alloy steel	SFM(Vc)	275	275	275	245	185	90	295	265	265	235	350	350	350	350	315	315	315
			IPT(fz)	.0008	.0008	.0008	.0007	.0006	.0005	.0011	.0010	.0010	.0009	.0012	.0012	.0012	.0012	.0011	.0011	.0011
			RPM	22320	22320	22320	19840	14880	7440	20300	18270	18270	16240	22600	22600	22600	22600	20340	20340	20340
			IPM(FEED)	37	37	37	29	19	8	43	35	35	28	53	53	53	53	43	43	43
			Ap	.0013	.0008	.0008	.0005	.0003	.0003	.0027	.0015	.0015	.0010	.0041	.0029	.0029	.0029	.0017	.0017	.0017
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	295	295	295	260	195	100	310	280	280	250	370	370	370	370	335	335	335
			IPT(fz)	.0009	.0009	.0009	.0008	.0007	.0006	.0012	.0011	.0011	.0009	.0013	.0013	.0013	.0013	.0012	.0012	.0012
			RPM	23670	23670	23670	21040	15780	7890	21500	19350	19350	17200	23900	23900	23900	23900	21510	21510	21510
			IPM(FEED)	44	44	44	35	23	10	51	41	41	33	62	62	62	62	50	50	50
			Ap	.0017	.0011	.0011	.0006	.0004	.0004	.0035	.0020	.0020	.0013	.0053	.0037	.0037	.0037	.0021	.0021	.0021
	11.2		SFM(Vc)	275	275	275	245	185	90	295	265	265	235	350	350	350	350	315	315	315
			IPT(fz)	.0008	.0008	.0008	.0007	.0006	.0005	.0011	.0010	.0010	.0009	.0012	.0012	.0012	.0012	.0011	.0011	.0011
			RPM	22320	22320	22320	19840	14880	7440	20300	18270	18270	16240	22600	22600	22600	22600	20340	20340	20340
			IPM(FEED)	37	37	37	29	19	8	43	35	35	28	53	53	53	53	43	43	43
			Ap	.0013	.0008	.0008	.0005	.0003	.0003	.0027	.0015	.0015	.0010	.0041	.0029	.0029	.0029	.0017	.0017	.0017
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	295	295	295	260	195	100	310	280	280	250	370	370	370	370	335	335	335
			IPT(fz)	.0009	.0009	.0009	.0008	.0007	.0006	.0012	.0011	.0011	.0009	.0013	.0013	.0013	.0013	.0012	.0012	.0012
			RPM	23670	23670	23670	21040	15780	7890	21500	19350	19350	17200	23900	23900	23900	23900	21510	21510	21510
			IPM(FEED)	44	44	44	35	23	10	51	41	41	33	62	62	62	62	50	50	50
			Ap	.0017	.0011	.0011	.0006	.0004	.0004	.0035	.0020	.0020	.0013	.0053	.0037	.0037	.0037	.0021	.0021	.0021
H	38.1-38.2	Hardened steel	SFM(Vc)	245	245	245	215	165	80	260	235	235	210	310	310	310	310	280	280	280
			IPT(fz)	.0008	.0008	.0008	.0007	.0006	.0005	.0010	.0009	.0009	.0008	.0011	.0011	.0011	.0011	.0010	.0010	.0010
			RPM	19710	19710	19710	17520	13140	6570	18000	16200	16200	14400	20000	20000	20000	20000	18000	18000	18000
			IPM(FEED)	30.3	30.3	30.3	24.0	15.7	6.7	36.8	29.7	29.7	23.6	42.3	42.3	42.3	42.3	34.3	34.3	34.3
			Ap	.0009	.0006	.0006	.0004	.0002	.0002	.0019	.0011	.0011	.0007	.0030	.0021	.0021	.0021	.0012	.0012	.0012
	40	Chilled Cast Iron	SFM(Vc)	275	275	275	245	185	90	295	265	265	235	350	350	350	350	315	315	315
			IPT(fz)	.0008	.0008	.0008	.0007	.0006	.0005	.0011	.0010	.0010	.0009	.0012	.0012	.0012	.0012	.0011	.0011	.0011
			RPM	22320	22320	22320	19840	14880	7440	20300	18270	18270	16240	22600	22600	22600	22600	20340	20340	20340
			IPM(FEED)	37	37	37	29	19	8	43	35	35	28	53	53	53	53	43	43	43
			Ap	.0013	.0008	.0008	.0005	.0003	.0003	.0027	.0015	.0015	.0010	.0041	.0029	.0029	.0029	.0017	.0017	.0017
	41	Hardened Cast Iron	SFM(Vc)	245	245	245	215	165	80	260	235	235	210	310	310	310	310	280	280	280
			IPT(fz)	.0008	.0008	.0008	.0007	.0006	.0005	.0010	.0009	.0009	.0008	.0011	.0011	.0011	.0011	.0010	.0010	.0010
			RPM	19710	19710	19710	17520	13140	6570	18000	16200	16200	14400	20000	20000	20000	20000	18000	18000	18000
			IPM(FEED)	30.3	30.3	30.3	24.0	15.7	6.7	36.8	29.7	29.7	23.6	42.3	42.3	42.3	42.3	34.3	34.3	34.3
			Ap	.0009	.0006	.0006	.0004	.0002	.0002	.0019	.0011	.0011	.0007	.0030	.0021	.0021	.0021	.0012	.0012	.0012

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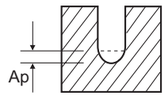
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																	
			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.8	1.8	1.8	1.8
		LBS	14	16	18	20	22	26	30	35	40	4	6	8	10	12	16	20	4	6	8	10
P	1-8	SFM(Vc)	335	295	295	295	295	220	220	110	110	365	365	365	330	330	330	295	410	410	410	370
		IPT(fz)	.0012	.0010	.0010	.0010	.0010	.0009	.0009	.0008	.0008	.0014	.0014	.0014	.0012	.0012	.0012	.0011	.0016	.0016	.0016	.0014
		RPM	21510	19120	19120	19120	19120	14340	14340	7170	7170	22200	22200	22200	19980	19980	19980	17760	22200	22200	22200	19980
		IPM(FEED)	50	40	40	40	40	26	26	11	11	61	61	61	50	50	50	39	70	70	70	57
		Ap	.0013	.0013	.0013	.0008	.0008	.0006	.0006	.0004	.0004	.0040	.0040	.0040	.0023	.0023	.0014	.0014	.0044	.0044	.0044	.0026
	9	SFM(Vc)	315	280	280	280	280	210	210	105	105	345	345	345	310	310	310	275	390	390	390	350
		IPT(fz)	.0011	.0009	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0012	.0012	.0012	.0011	.0011	.0011	.0010	.0014	.0014	.0014	.0012
		RPM	20340	18080	18080	18080	18080	13560	13560	6780	6780	21000	21000	21000	18900	18900	18900	16800	21000	21000	21000	18900
		IPM(FEED)	43	34	34	34	34	22	22	10	10	51	51	51	42	42	42	33	58	58	58	47
		Ap	.0010	.0010	.0010	.0006	.0006	.0004	.0004	.0003	.0003	.0031	.0031	.0031	.0018	.0018	.0011	.0011	.0035	.0035	.0035	.0020
	10-11.1	SFM(Vc)	335	295	295	295	295	220	220	110	110	365	365	365	330	330	330	295	410	410	410	370
		IPT(fz)	.0012	.0010	.0010	.0010	.0010	.0009	.0009	.0008	.0008	.0014	.0014	.0014	.0012	.0012	.0012	.0011	.0016	.0016	.0016	.0014
		RPM	21510	19120	19120	19120	19120	14340	14340	7170	7170	22200	22200	22200	19980	19980	19980	17760	22200	22200	22200	19980
		IPM(FEED)	50	40	40	40	40	26	26	11	11	61	61	61	50	50	50	39	70	70	70	57
		Ap	.0013	.0013	.0013	.0008	.0008	.0006	.0006	.0004	.0004	.0040	.0040	.0040	.0023	.0023	.0014	.0014	.0044	.0044	.0044	.0026
	11.2	SFM(Vc)	315	280	280	280	280	210	210	105	105	345	345	345	310	310	310	275	390	390	390	350
		IPT(fz)	.0011	.0009	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0012	.0012	.0012	.0011	.0011	.0011	.0010	.0014	.0014	.0014	.0012
		RPM	20340	18080	18080	18080	18080	13560	13560	6780	6780	21000	21000	21000	18900	18900	18900	16800	21000	21000	21000	18900
		IPM(FEED)	43	34	34	34	34	22	22	10	10	51	51	51	42	42	42	33	58	58	58	47
		Ap	.0010	.0010	.0010	.0006	.0006	.0004	.0004	.0003	.0003	.0031	.0031	.0031	.0018	.0018	.0011	.0011	.0035	.0035	.0035	.0020
K	15-20	SFM(Vc)	335	295	295	295	295	220	220	110	110	365	365	365	330	330	330	295	410	410	410	370
		IPT(fz)	.0012	.0010	.0010	.0010	.0010	.0009	.0009	.0008	.0008	.0014	.0014	.0014	.0012	.0012	.0012	.0011	.0016	.0016	.0016	.0014
		RPM	21510	19120	19120	19120	19120	14340	14340	7170	7170	22200	22200	22200	19980	19980	19980	17760	22200	22200	22200	19980
		IPM(FEED)	50	40	40	40	40	26	26	11	11	61	61	61	50	50	50	39	70	70	70	57
		Ap	.0013	.0013	.0013	.0008	.0008	.0006	.0006	.0004	.0004	.0040	.0040	.0040	.0023	.0023	.0014	.0014	.0044	.0044	.0044	.0026
H	38.1-38.2	SFM(Vc)	280	245	245	245	245	185	185	95	95	305	305	305	275	275	275	245	345	345	345	310
		IPT(fz)	.0010	.0009	.0009	.0009	.0009	.0007	.0007	.0006	.0006	.0012	.0012	.0012	.0011	.0011	.0011	.0009	.0013	.0013	.0013	.0012
		RPM	18000	16000	16000	16000	16000	12000	12000	6000	6000	18500	18500	18500	16650	16650	16650	14800	18500	18500	18500	16650
		IPM(FEED)	34.3	27.2	27.2	27.2	27.2	17.7	17.7	7.7	7.7	43.7	43.7	43.7	35.4	35.4	35.4	28.0	48.2	48.2	48.2	39.0
		Ap	.0007	.0007	.0007	.0004	.0004	.0003	.0003	.0002	.0002	.0022	.0022	.0022	.0013	.0013	.0008	.0008	.0025	.0025	.0025	.0014
	40	SFM(Vc)	315	280	280	280	280	210	210	105	105	345	345	345	310	310	310	275	390	390	390	350
		IPT(fz)	.0011	.0009	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0012	.0012	.0012	.0011	.0011	.0011	.0010	.0014	.0014	.0014	.0012
		RPM	20340	18080	18080	18080	18080	13560	13560	6780	6780	21000	21000	21000	18900	18900	18900	16800	21000	21000	21000	18900
		IPM(FEED)	43	34	34	34	34	22	22	10	10	51	51	51	42	42	42	33	58	58	58	47
		Ap	.0010	.0010	.0010	.0006	.0006	.0004	.0004	.0003	.0003	.0031	.0031	.0031	.0018	.0018	.0011	.0011	.0035	.0035	.0035	.0020
	41	SFM(Vc)	280	245	245	245	245	185	185	95	95	305	305	305	275	275	275	245	345	345	345	310
		IPT(fz)	.0010	.0009	.0009	.0009	.0009	.0007	.0007	.0006	.0006	.0012	.0012	.0012	.0011	.0011	.0011	.0009	.0013	.0013	.0013	.0012
		RPM	18000	16000	16000	16000	16000	12000	12000	6000	6000	18500	18500	18500	16650	16650	16650	14800	18500	18500	18500	16650
		IPM(FEED)	34.3	27.2	27.2	27.2	27.2	17.7	17.7	7.7	7.7	43.7	43.7	43.7	35.4	35.4	35.4	28.0	48.2	48.2	48.2	39.0
		Ap	.0007	.0007	.0007	.0004	.0004	.0003	.0003	.0002	.0002	.0022	.0022	.0022	.0013	.0013	.0008	.0008	.0025	.0025	.0025	.0014

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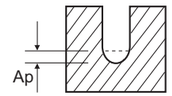
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				1.8	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
				LBS	12	16	20	6	8	10	12	14	16	18	20	22	26	30	35	40	45
P	1-8	Non-alloy steel	SFM(Vc)	370	370	330	370	370	370	335	335	335	335	335	295	295	295	225	225	110
			IPT(fz)	.0014	.0014	.0013	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0012
			RPM	19980	19980	17760	18000	18000	18000	16200	16200	16200	16200	16200	14400	14400	14400	10800	10800	5400
			IPM(FEED)	57	57	45	71	71	71	57	57	57	57	57	45	45	45	30	30	13
			Ap	.0026	.0016	.0016	.0071	.0050	.0050	.0028	.0028	.0028	.0018	.0018	.0018	.0018	.0011	.0007	.0007	.0007
	9	Low alloy steel	SFM(Vc)	350	350	310	350	350	350	315	315	315	315	315	280	280	280	210	210	105
			IPT(fz)	.0012	.0012	.0011	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0012	.0012	.0011
			RPM	18900	18900	16800	17000	17000	17000	15300	15300	15300	15300	15300	13600	13600	13600	10200	10200	5100
			IPM(FEED)	47	47	37	60	60	60	49	49	49	49	49	38	38	38	25	25	11
			Ap	.0020	.0013	.0013	.0055	.0039	.0039	.0022	.0022	.0022	.0014	.0014	.0014	.0014	.0008	.0006	.0006	.0006
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	370	370	330	370	370	370	335	335	335	335	335	295	295	295	225	225	110
			IPT(fz)	.0014	.0014	.0013	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0012
			RPM	19980	19980	17760	18000	18000	18000	16200	16200	16200	16200	16200	14400	14400	14400	10800	10800	5400
			IPM(FEED)	57	57	45	71	71	71	57	57	57	57	57	45	45	45	30	30	13
			Ap	.0026	.0016	.0016	.0071	.0050	.0050	.0028	.0028	.0028	.0018	.0018	.0018	.0018	.0011	.0007	.0007	.0007
	11.2		SFM(Vc)	350	350	310	350	350	350	315	315	315	315	315	280	280	280	210	210	105
			IPT(fz)	.0012	.0012	.0011	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0012	.0012	.0011
			RPM	18900	18900	16800	17000	17000	17000	15300	15300	15300	15300	15300	13600	13600	13600	10200	10200	5100
			IPM(FEED)	47	47	37	60	60	60	49	49	49	49	49	38	38	38	25	25	11
			Ap	.0020	.0013	.0013	.0055	.0039	.0039	.0022	.0022	.0022	.0014	.0014	.0014	.0014	.0008	.0006	.0006	.0006
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	370	370	330	370	370	370	335	335	335	335	335	295	295	295	225	225	110
			IPT(fz)	.0014	.0014	.0013	.0020	.0020	.0020	.0018	.0018	.0018	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0012
			RPM	19980	19980	17760	18000	18000	18000	16200	16200	16200	16200	16200	14400	14400	14400	10800	10800	5400
			IPM(FEED)	57	57	45	71	71	71	57	57	57	57	57	45	45	45	30	30	13
			Ap	.0026	.0016	.0016	.0071	.0050	.0050	.0028	.0028	.0028	.0018	.0018	.0018	.0018	.0011	.0007	.0007	.0007
H	38.1-38.2	Hardened steel	SFM(Vc)	310	310	275	310	310	310	280	280	280	280	280	245	245	245	185	185	95
			IPT(fz)	.0012	.0012	.0010	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0012	.0012	.0010
			RPM	16650	16650	14800	15000	15000	15000	13500	13500	13500	13500	13500	12000	12000	12000	9000	9000	4500
			IPM(FEED)	39.0	39.0	30.9	50.6	50.6	50.6	40.9	40.9	40.9	40.9	40.9	32.3	32.3	32.3	21.3	21.3	9.1
			Ap	.0014	.0009	.0009	.0039	.0028	.0028	.0016	.0016	.0016	.0010	.0010	.0010	.0010	.0006	.0004	.0004	.0004
	40	Chilled Cast Iron	SFM(Vc)	350	350	310	350	350	350	315	315	315	315	315	280	280	280	210	210	105
			IPT(fz)	.0012	.0012	.0011	.0018	.0018	.0018	.0016	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0012	.0012	.0011
			RPM	18900	18900	16800	17000	17000	17000	15300	15300	15300	15300	15300	13600	13600	13600	10200	10200	5100
			IPM(FEED)	47	47	37	60	60	60	49	49	49	49	49	38	38	38	25	25	11
			Ap	.0020	.0013	.0013	.0055	.0039	.0039	.0022	.0022	.0022	.0014	.0014	.0014	.0014	.0008	.0006	.0006	.0006
	41	Hardened Cast Iron	SFM(Vc)	310	310	275	310	310	310	280	280	280	280	280	245	245	245	185	185	95
			IPT(fz)	.0012	.0012	.0010	.0017	.0017	.0017	.0015	.0015	.0015	.0015	.0015	.0013	.0013	.0013	.0012	.0012	.0010
			RPM	16650	16650	14800	15000	15000	15000	13500	13500	13500	13500	13500	12000	12000	12000	9000	9000	4500
			IPM(FEED)	39.0	39.0	30.9	50.6	50.6	50.6	40.9	40.9	40.9	40.9	40.9	32.3	32.3	32.3	21.3	21.3	9.1
			Ap	.0014	.0009	.0009	.0039	.0028	.0028	.0016	.0016	.0016	.0010	.0010	.0010	.0010	.0006	.0004	.0004	.0004

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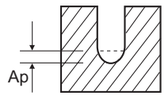
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																	
			2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0
			LBS	50	60	8	10	12	16	20	22	26	30	35	40	45	50	6	8	10	12	14	16
P	1-8	SFM(Vc)	110	110	405	405	405	365	365	365	325	325	325	245	245	245	425	425	425	425	425	380
		IPT(fz)	.0012	.0012	.0024	.0024	.0024	.0022	.0022	.0022	.0019	.0019	.0019	.0017	.0017	.0017	.0029	.0029	.0029	.0029	.0029	.0026
		RPM	5400	5400	15800	15800	15800	14220	14220	14220	12640	12640	12640	9480	9480	9480	13700	13700	13700	13700	13700	12330
		IPM(FEED)	13	13	76	76	76	61	61	61	48	48	48	32	32	32	81	81	81	81	81	65
		Ap	.0007	.0007	.0062	.0062	.0062	.0035	.0035	.0022	.0022	.0022	.0013	.0013	.0009	.0009	.0106	.0106	.0074	.0074	.0074	.0043
	9	SFM(Vc)	105	105	385	385	385	345	345	345	305	305	305	230	230	230	400	400	400	400	400	360
		IPT(fz)	.0011	.0011	.0021	.0021	.0021	.0019	.0019	.0019	.0017	.0017	.0017	.0015	.0015	.0015	.0026	.0026	.0026	.0026	.0026	.0024
		RPM	5100	5100	14900	14900	14900	13410	13410	13410	11920	11920	11920	8940	8940	8940	12900	12900	12900	12900	12900	11610
		IPM(FEED)	11	11	63	63	63	51	51	51	40	40	40	27	27	27	68	68	68	68	68	55
		Ap	.0006	.0006	.0048	.0048	.0048	.0028	.0028	.0017	.0017	.0017	.0010	.0010	.0007	.0007	.0083	.0083	.0058	.0058	.0058	.0033
	10-11.1	SFM(Vc)	110	110	405	405	405	365	365	365	325	325	325	245	245	245	425	425	425	425	425	380
		IPT(fz)	.0012	.0012	.0024	.0024	.0024	.0022	.0022	.0022	.0019	.0019	.0019	.0017	.0017	.0017	.0029	.0029	.0029	.0029	.0029	.0026
		RPM	5400	5400	15800	15800	15800	14220	14220	14220	12640	12640	12640	9480	9480	9480	13700	13700	13700	13700	13700	12330
		IPM(FEED)	13	13	76	76	76	61	61	61	48	48	48	32	32	32	81	81	81	81	81	65
		Ap	.0007	.0007	.0062	.0062	.0062	.0035	.0035	.0022	.0022	.0022	.0013	.0013	.0009	.0009	.0106	.0106	.0074	.0074	.0074	.0043
	11.2	SFM(Vc)	105	105	385	385	385	345	345	345	305	305	305	230	230	230	400	400	400	400	400	360
		IPT(fz)	.0011	.0011	.0021	.0021	.0021	.0019	.0019	.0019	.0017	.0017	.0017	.0015	.0015	.0015	.0026	.0026	.0026	.0026	.0026	.0024
		RPM	5100	5100	14900	14900	14900	13410	13410	13410	11920	11920	11920	8940	8940	8940	12900	12900	12900	12900	12900	11610
		IPM(FEED)	11	11	63	63	63	51	51	51	40	40	40	27	27	27	68	68	68	68	68	55
		Ap	.0006	.0006	.0048	.0048	.0048	.0028	.0028	.0017	.0017	.0017	.0010	.0010	.0007	.0007	.0083	.0083	.0058	.0058	.0058	.0033
K	15-20	SFM(Vc)	110	110	405	405	405	365	365	365	325	325	325	245	245	245	425	425	425	425	425	380
		IPT(fz)	.0012	.0012	.0024	.0024	.0024	.0022	.0022	.0022	.0019	.0019	.0019	.0017	.0017	.0017	.0029	.0029	.0029	.0029	.0029	.0026
		RPM	5400	5400	15800	15800	15800	14220	14220	14220	12640	12640	12640	9480	9480	9480	13700	13700	13700	13700	13700	12330
		IPM(FEED)	13	13	76	76	76	61	61	61	48	48	48	32	32	32	81	81	81	81	81	65
		Ap	.0007	.0007	.0062	.0062	.0062	.0035	.0035	.0022	.0022	.0022	.0013	.0013	.0009	.0009	.0106	.0106	.0074	.0074	.0074	.0043
H	38.1-38.2	SFM(Vc)	95	95	340	340	340	305	305	305	270	270	270	205	205	205	350	350	350	350	350	315
		IPT(fz)	.0010	.0010	.0019	.0019	.0019	.0017	.0017	.0017	.0016	.0016	.0016	.0014	.0014	.0014	.0025	.0025	.0025	.0025	.0025	.0022
		RPM	4500	4500	13200	13200	13200	11880	11880	11880	10560	10560	10560	7920	7920	7920	11400	11400	11400	11400	11400	10260
		IPM(FEED)	9.1	9.1	51.4	51.4	51.4	41.5	41.5	41.5	32.9	32.9	32.9	21.7	21.7	21.7	56.5	56.5	56.5	56.5	56.5	45.7
		Ap	.0004	.0004	.0035	.0035	.0035	.0020	.0020	.0012	.0012	.0012	.0007	.0007	.0005	.0005	.0059	.0059	.0041	.0041	.0041	.0024
	40	SFM(Vc)	105	105	385	385	385	345	345	345	305	305	305	230	230	230	400	400	400	400	400	360
		IPT(fz)	.0011	.0011	.0021	.0021	.0021	.0019	.0019	.0019	.0017	.0017	.0017	.0015	.0015	.0015	.0026	.0026	.0026	.0026	.0026	.0024
		RPM	5100	5100	14900	14900	14900	13410	13410	13410	11920	11920	11920	8940	8940	8940	12900	12900	12900	12900	12900	11610
		IPM(FEED)	11	11	63	63	63	51	51	51	40	40	40	27	27	27	68	68	68	68	68	55
		Ap	.0006	.0006	.0048	.0048	.0048	.0028	.0028	.0017	.0017	.0017	.0010	.0010	.0007	.0007	.0083	.0083	.0058	.0058	.0058	.0033
	41	SFM(Vc)	95	95	340	340	340	305	305	305	270	270	270	205	205	205	350	350	350	350	350	315
		IPT(fz)	.0010	.0010	.0019	.0019	.0019	.0017	.0017	.0017	.0016	.0016	.0016	.0014	.0014	.0014	.0025	.0025	.0025	.0025	.0025	.0022
		RPM	4500	4500	13200	13200	13200	11880	11880	11880	10560	10560	10560	7920	7920	7920	11400	11400	11400	11400	11400	10260
		IPM(FEED)	9.1	9.1	51.4	51.4	51.4	41.5	41.5	41.5	32.9	32.9	32.9	21.7	21.7	21.7	56.5	56.5	56.5	56.5	56.5	45.7
		Ap	.0004	.0004	.0035	.0035	.0035	.0020	.0020	.0012	.0012	.0012	.0007	.0007	.0005	.0005	.0059	.0059	.0041	.0041	.0041	.0024

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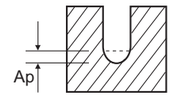
(Depth of Cut per one pass)



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																			
				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
				LBS	18	20	22	26	30	35	40	45	50	60	8	10	12	14	16	18	20	22	26
P	1-8	Non-alloy steel	SFM(Vc)		380	380	380	380	380	340	340	340	255	255	405	405	405	405	405	405	405	405	365
			IPT(fz)		.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0021	.0021	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0035	.0035
			RPM		12330	12330	12330	12330	12330	10960	10960	10960	8220	8220	9800	9800	9800	9800	9800	9800	9800	8820	8820
			IPM(FEED)		65	65	65	65	65	52	52	52	34	34	77	77	77	77	77	77	77	63	63
			Ap		.0043	.0043	.0043	.0027	.0027	.0027	.0016	.0016	.0011	.0011	.0142	.0142	.0142	.0099	.0099	.0099	.0099	.0057	.0057
	9	Low alloy steel	SFM(Vc)		360	360	360	360	360	320	320	320	240	240	385	385	385	385	385	385	385	345	345
			IPT(fz)		.0024	.0024	.0024	.0024	.0024	.0021	.0021	.0021	.0018	.0018	.0035	.0035	.0035	.0035	.0035	.0035	.0035	.0032	.0032
			RPM		11610	11610	11610	11610	11610	10320	10320	10320	7740	7740	9300	9300	9300	9300	9300	9300	9300	8370	8370
			IPM(FEED)		55	55	55	55	55	44	44	44	29	29	66	66	66	66	66	66	66	53	53
			Ap		.0033	.0033	.0033	.0021	.0021	.0021	.0013	.0013	.0008	.0008	.0110	.0110	.0110	.0077	.0077	.0077	.0077	.0044	.0044
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)		380	380	380	380	380	340	340	340	255	255	405	405	405	405	405	405	405	365	365
			IPT(fz)		.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0021	.0021	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0035	.0035
			RPM		12330	12330	12330	12330	12330	10960	10960	10960	8220	8220	9800	9800	9800	9800	9800	9800	9800	8820	8820
			IPM(FEED)		65	65	65	65	65	52	52	52	34	34	77	77	77	77	77	77	77	63	63
			Ap		.0043	.0043	.0043	.0027	.0027	.0027	.0016	.0016	.0011	.0011	.0142	.0142	.0142	.0099	.0099	.0099	.0099	.0057	.0057
	11.2		SFM(Vc)		360	360	360	360	360	320	320	320	240	240	385	385	385	385	385	385	385	345	345
			IPT(fz)		.0024	.0024	.0024	.0024	.0024	.0021	.0021	.0021	.0018	.0018	.0035	.0035	.0035	.0035	.0035	.0035	.0035	.0032	.0032
			RPM		11610	11610	11610	11610	11610	10320	10320	10320	7740	7740	9300	9300	9300	9300	9300	9300	9300	8370	8370
			IPM(FEED)		55	55	55	55	55	44	44	44	29	29	66	66	66	66	66	66	66	53	53
			Ap		.0033	.0033	.0033	.0021	.0021	.0021	.0013	.0013	.0008	.0008	.0110	.0110	.0110	.0077	.0077	.0077	.0077	.0044	.0044
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)		380	380	380	380	380	340	340	340	255	255	405	405	405	405	405	405	405	365	365
			IPT(fz)		.0026	.0026	.0026	.0026	.0026	.0024	.0024	.0024	.0021	.0021	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0035	.0035
			RPM		12330	12330	12330	12330	12330	10960	10960	10960	8220	8220	9800	9800	9800	9800	9800	9800	9800	8820	8820
			IPM(FEED)		65	65	65	65	65	52	52	52	34	34	77	77	77	77	77	77	77	63	63
			Ap		.0043	.0043	.0043	.0027	.0027	.0027	.0016	.0016	.0011	.0011	.0142	.0142	.0142	.0099	.0099	.0099	.0099	.0057	.0057
H	38.1-38.2	Hardened steel	SFM(Vc)		315	315	315	315	315	280	280	280	210	210	340	340	340	340	340	340	340	305	305
			IPT(fz)		.0022	.0022	.0022	.0022	.0022	.0020	.0020	.0020	.0017	.0017	.0034	.0034	.0034	.0034	.0034	.0034	.0034	.0030	.0030
			RPM		10260	10260	10260	10260	10260	9120	9120	9120	6840	6840	8200	8200	8200	8200	8200	8200	8200	7380	7380
			IPM(FEED)		45.7	45.7	45.7	45.7	45.7	36.2	36.2	36.2	23.8	23.8	54.9	54.9	54.9	54.9	54.9	54.9	54.9	44.5	44.5
			Ap		.0024	.0024	.0024	.0015	.0015	.0015	.0009	.0009	.0006	.0006	.0079	.0079	.0079	.0055	.0055	.0055	.0055	.0031	.0031
	40	Chilled Cast Iron	SFM(Vc)		360	360	360	360	360	320	320	320	240	240	385	385	385	385	385	385	385	345	345
			IPT(fz)		.0024	.0024	.0024	.0024	.0024	.0021	.0021	.0021	.0018	.0018	.0035	.0035	.0035	.0035	.0035	.0035	.0035	.0032	.0032
			RPM		11610	11610	11610	11610	11610	10320	10320	10320	7740	7740	9300	9300	9300	9300	9300	9300	9300	8370	8370
			IPM(FEED)		55	55	55	55	55	44	44	44	29	29	66	66	66	66	66	66	66	53	53
			Ap		.0033	.0033	.0033	.0021	.0021	.0021	.0013	.0013	.0008	.0008	.0110	.0110	.0110	.0077	.0077	.0077	.0077	.0044	.0044
	41	Hardened Cast Iron	SFM(Vc)		315	315	315	315	315	280	280	280	210	210	340	340	340	340	340	340	340	305	305
			IPT(fz)		.0022	.0022	.0022	.0022	.0022	.0020	.0020	.0020	.0017	.0017	.0034	.0034	.0034	.0034	.0034	.0034	.0034	.0030	.0030
			RPM		10260	10260	10260	10260	10260	9120	9120	9120	6840	6840	8200	8200	8200	8200	8200	8200	8200	7380	7380
			IPM(FEED)		45.7	45.7	45.7	45.7	45.7	36.2	36.2	36.2	23.8	23.8	54.9	54.9	54.9	54.9	54.9	54.9	54.9	44.5	44.5
			Ap		.0024	.0024	.0024	.0015	.0015	.0015	.0009	.0009	.0006	.0006	.0079	.0079	.0079	.0055	.0055	.0055	.0055	.0031	.0031

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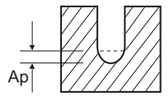
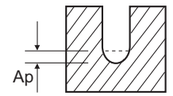
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS
SEM846 SERIES — 2 FLUTE BALL NOSE - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																				
			4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0	12.0	12.0
		LBS	30	35	40	45	50	60	15	20	26	30	35	40	50	60	20	30	25	30	30	40	32	45
P	1-8	SFM(Vc)	365	365	365	325	325	325	395	395	355	355	355	355	355	315	400	400	400	400	395	395	395	395
		IPT(fz)	.0035	.0035	.0035	.0032	.0032	.0032	.0047	.0047	.0042	.0042	.0042	.0042	.0042	.0038	.0058	.0058	.0073	.0073	.0084	.0084	.0094	.0094
		RPM	8820	8820	8820	7840	7840	7840	7700	7700	6930	6930	6930	6930	6930	6160	6500	6500	4850	4850	3850	3850	3200	3200
		IPM(FEED)	63	63	63	50	50	50	73	73	59	59	59	59	59	46	75	75	71	71	65	65	60	60
		Ap	.0057	.0035	.0035	.0035	.0035	.0021	.0124	.0124	.0071	.0071	.0071	.0071	.0044	.0044	.0149	.0149	.0198	.0198	.0354	.0248	.0425	.0298
	9	SFM(Vc)	345	345	345	305	305	305	375	375	340	340	340	340	340	300	385	385	380	380	380	380	375	375
		IPT(fz)	.0032	.0032	.0032	.0028	.0028	.0028	.0039	.0039	.0035	.0035	.0035	.0035	.0035	.0031	.0051	.0051	.0064	.0064	.0075	.0075	.0084	.0084
		RPM	8370	8370	8370	7440	7440	7440	7300	7300	6570	6570	6570	6570	6570	5840	6200	6200	4600	4600	3680	3680	3050	3050
		IPM(FEED)	53	53	53	42	42	42	57	57	46	46	46	46	46	37	63	63	59	59	55	55	51	51
		Ap	.0044	.0028	.0028	.0028	.0028	.0017	.0096	.0096	.0055	.0055	.0055	.0055	.0035	.0035	.0116	.0116	.0154	.0154	.0276	.0193	.0331	.0231
	10-11.1	SFM(Vc)	365	365	365	325	325	325	395	395	355	355	355	355	355	315	400	400	400	400	395	395	395	395
		IPT(fz)	.0035	.0035	.0035	.0032	.0032	.0032	.0047	.0047	.0042	.0042	.0042	.0042	.0042	.0038	.0058	.0058	.0073	.0073	.0084	.0084	.0094	.0094
		RPM	8820	8820	8820	7840	7840	7840	7700	7700	6930	6930	6930	6930	6930	6160	6500	6500	4850	4850	3850	3850	3200	3200
		IPM(FEED)	63	63	63	50	50	50	73	73	59	59	59	59	59	46	75	75	71	71	65	65	60	60
		Ap	.0057	.0035	.0035	.0035	.0035	.0021	.0124	.0124	.0071	.0071	.0071	.0071	.0044	.0044	.0149	.0149	.0198	.0198	.0354	.0248	.0425	.0298
	11.2	SFM(Vc)	345	345	345	305	305	305	375	375	340	340	340	340	340	300	385	385	380	380	380	380	375	375
		IPT(fz)	.0032	.0032	.0032	.0028	.0028	.0028	.0039	.0039	.0035	.0035	.0035	.0035	.0035	.0031	.0051	.0051	.0064	.0064	.0075	.0075	.0084	.0084
		RPM	8370	8370	8370	7440	7440	7440	7300	7300	6570	6570	6570	6570	6570	5840	6200	6200	4600	4600	3680	3680	3050	3050
		IPM(FEED)	53	53	53	42	42	42	57	57	46	46	46	46	46	37	63	63	59	59	55	55	51	51
		Ap	.0044	.0028	.0028	.0028	.0028	.0017	.0096	.0096	.0055	.0055	.0055	.0055	.0035	.0035	.0116	.0116	.0154	.0154	.0276	.0193	.0331	.0231
K	15-20	SFM(Vc)	365	365	365	325	325	325	395	395	355	355	355	355	355	315	400	400	400	400	395	395	395	395
		IPT(fz)	.0035	.0035	.0035	.0032	.0032	.0032	.0047	.0047	.0042	.0042	.0042	.0042	.0042	.0038	.0058	.0058	.0073	.0073	.0084	.0084	.0094	.0094
		RPM	8820	8820	8820	7840	7840	7840	7700	7700	6930	6930	6930	6930	6930	6160	6500	6500	4850	4850	3850	3850	3200	3200
		IPM(FEED)	63	63	63	50	50	50	73	73	59	59	59	59	59	46	75	75	71	71	65	65	60	60
		Ap	.0057	.0035	.0035	.0035	.0035	.0021	.0124	.0124	.0071	.0071	.0071	.0071	.0044	.0044	.0149	.0149	.0198	.0198	.0354	.0248	.0425	.0298
H	38.1-38.2	SFM(Vc)	305	305	305	270	270	270	330	330	295	295	295	295	295	265	340	340	330	330	330	330	330	330
		IPT(fz)	.0030	.0030	.0030	.0027	.0027	.0027	.0040	.0040	.0036	.0036	.0036	.0036	.0036	.0032	.0048	.0048	.0063	.0063	.0074	.0074	.0082	.0082
		RPM	7380	7380	7380	6560	6560	6560	6400	6400	5760	5760	5760	5760	5760	5120	5500	5500	4000	4000	3200	3200	2650	2650
		IPM(FEED)	44.5	44.5	44.5	35.2	35.2	35.2	50.6	50.6	40.9	40.9	40.9	40.9	40.9	32.3	52.4	52.4	50.4	50.4	47.2	47.2	43.3	43.3
		Ap	.0031	.0020	.0020	.0020	.0020	.0012	.0069	.0069	.0039	.0039	.0039	.0039	.0025	.0025	.0083	.0083	.0110	.0110	.0197	.0138	.0236	.0165
	40	SFM(Vc)	345	345	345	305	305	305	375	375	340	340	340	340	340	300	385	385	380	380	380	380	375	375
		IPT(fz)	.0032	.0032	.0032	.0028	.0028	.0028	.0039	.0039	.0035	.0035	.0035	.0035	.0035	.0031	.0051	.0051	.0064	.0064	.0075	.0075	.0084	.0084
		RPM	8370	8370	8370	7440	7440	7440	7300	7300	6570	6570	6570	6570	6570	5840	6200	6200	4600	4600	3680	3680	3050	3050
		IPM(FEED)	53	53	53	42	42	42	57	57	46	46	46	46	46	37	63	63	59	59	55	55	51	51
		Ap	.0044	.0028	.0028	.0028	.0028	.0017	.0096	.0096	.0055	.0055	.0055	.0055	.0035	.0035	.0116	.0116	.0154	.0154	.0276	.0193	.0331	.0231
	41	SFM(Vc)	305	305	305	270	270	270	330	330	295	295	295	295	295	265	340	340	330	330	330	330	330	330
		IPT(fz)	.0030	.0030	.0030	.0027	.0027	.0027	.0040	.0040	.0036	.0036	.0036	.0036	.0036	.0032	.0048	.0048	.0063	.0063	.0074	.0074	.0082	.0082
		RPM	7380	7380	7380	6560	6560	6560	6400	6400	5760	5760	5760	5760	5760	5120	5500	5500	4000	4000	3200	3200	2650	2650
		IPM(FEED)	44.5	44.5	44.5	35.2	35.2	35.2	50.6	50.6	40.9	40.9	40.9	40.9	40.9	32.3	52.4	52.4	50.4	50.4	47.2	47.2	43.3	43.3
		Ap	.0031	.0020	.0020	.0020	.0020	.0012	.0069	.0069	.0039	.0039	.0039	.0039	.0025	.0025	.0083	.0083	.0110	.0110	.0197	.0138	.0236	.0165

(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEMD99 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5
P	1-8	Non-alloy steel	1.0D	0.2D	SFM(Vc)	90	125	170	185	185	215	245	280	285	305	340	370	385
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004
					RPM	44000	41000	41000	36000	30000	30000	30000	30000	27600	24800	22000	18000	15000
					IPM(FEED)	6	7	7	7	8	8	8	9	9	10	10	10	11
	9	Low alloy steel	1.0D	0.2D	SFM(Vc)	60	85	110	120	120	145	165	175	185	195	210	240	245
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003
					RPM	28800	27000	27000	23400	19800	19800	19800	18900	18000	15750	13500	11560	9500
					IPM(FEED)	2	3	3	3	4	4	4	4	4	4	4	5	5
	10-11.1	High alloyed steel, and tool steel	1.0D	0.2D	SFM(Vc)	90	125	170	185	185	215	245	280	285	305	340	370	385
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004
					RPM	44000	41000	41000	36000	30000	30000	30000	30000	27600	24800	22000	18000	15000
					IPM(FEED)	6	7	7	7	8	8	8	9	9	10	10	10	11
	11.2		1.0D	0.2D	SFM(Vc)	60	85	110	120	120	145	165	175	185	195	210	240	245
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003
					RPM	28800	27000	27000	23400	19800	19800	19800	18900	18000	15750	13500	11560	9500
					IPM(FEED)	2	3	3	3	4	4	4	4	4	4	4	5	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.2D	SFM(Vc)	90	125	170	185	185	215	245	280	285	305	340	370	385
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0004
					RPM	44000	41000	41000	36000	30000	30000	30000	30000	27600	24800	22000	18000	15000
					IPM(FEED)	6	7	7	7	8	8	8	9	9	10	10	10	11
H	38.1-38.2	Hardened steel	1.0D	0.2D	SFM(Vc)	35	50	70	75	75	85	100	105	115	120	130	150	155
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
					RPM	17600	16500	16500	14300	12100	12100	12100	11550	11000	9750	8500	7200	6100
					IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	3	3
	40	Chilled Cast Iron	1.0D	0.2D	SFM(Vc)	60	85	110	120	120	145	165	175	185	195	210	240	245
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003
					RPM	28800	27000	27000	23400	19800	19800	19800	18900	18000	15750	13500	11560	9500
					IPM(FEED)	2	3	3	3	4	4	4	4	4	4	4	5	5
	41	Hardened Cast Iron	1.0D	0.2D	SFM(Vc)	35	50	70	75	75	85	100	105	115	120	130	150	155
					IPT(fz)	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
					RPM	17600	16500	16500	14300	12100	12100	12100	11550	11000	9750	8500	7200	6100
					IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	3	3

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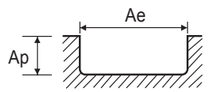
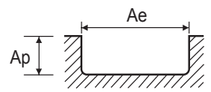


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEMD99 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø) 3.0	3.5	4.0	4.5	5.0	5.5	6.0	7.0	8.0	10.0	11.0	12.0	14.0	16.0	20.0
P	1-8	1.0D	0.2D	SFM(Vc)	410	430	440	460	470	485	490	500	495	520	520	510	520	510	520
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0011	.0012	.0015	.0018	.0021	.0021	.0020	.0021	.0023	.0022
				RPM	13240	11980	10720	9940	9160	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
				IPM(FEED)	11	12	13	15	17	18	20	20	21	21	19	17	15	14	11
	9	1.0D	0.2D	SFM(Vc)	265	275	280	295	300	305	310	320	315	340	345	345	350	345	340
				IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0011	.0013	.0015	.0016	.0016	.0016	.0016	.0014
				RPM	8560	7690	6820	6310	5800	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
				IPM(FEED)	6	6	7	7	8	9	10	10	10	10	9	9	8	7	5
	10-11.1	1.0D	0.2D	SFM(Vc)	410	430	440	460	470	485	490	500	495	520	520	510	520	510	520
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0011	.0012	.0015	.0018	.0021	.0021	.0020	.0021	.0023	.0022
				RPM	13240	11980	10720	9940	9160	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
				IPM(FEED)	11	12	13	15	17	18	20	20	21	21	19	17	15	14	11
	11.2	1.0D	0.2D	SFM(Vc)	265	275	280	295	300	305	310	320	315	340	345	345	350	345	340
				IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0011	.0013	.0015	.0016	.0016	.0016	.0016	.0014
				RPM	8560	7690	6820	6310	5800	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
				IPM(FEED)	6	6	7	7	8	9	10	10	10	10	9	9	8	7	5
K	15-20	1.0D	0.2D	SFM(Vc)	410	430	440	460	470	485	490	500	495	520	520	510	520	510	520
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0011	.0012	.0015	.0018	.0021	.0021	.0020	.0021	.0023	.0022
				RPM	13240	11980	10720	9940	9160	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
				IPM(FEED)	11	12	13	15	17	18	20	20	21	21	19	17	15	14	11
H	38.1-38.2	1.0D	0.2D	SFM(Vc)	165	175	175	200	195	200	205	210	210	210	210	210	215	210	205
				IPT(fz)	.0003	.0003	.0004	.0004	.0005	.0006	.0007	.0008	.0009	.0012	.0012	.0012	.0012	.0012	.0012
				RPM	5280	4790	4300	4300	3800	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000
				IPM(FEED)	3	3	3	4	4	4	5	5	5	5	4	4	4	3	2
	40	1.0D	0.2D	SFM(Vc)	265	275	280	295	300	305	310	320	315	340	345	345	350	345	340
				IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0008	.0010	.0011	.0013	.0015	.0016	.0016	.0016	.0016	.0014
				RPM	8560	7690	6820	6310	5800	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
				IPM(FEED)	6	6	7	7	8	9	10	10	10	10	9	9	8	7	5
	41	1.0D	0.2D	SFM(Vc)	165	175	175	200	195	200	205	210	210	210	210	210	215	210	205
				IPT(fz)	.0003	.0003	.0004	.0004	.0005	.0006	.0007	.0008	.0009	.0012	.0012	.0012	.0012	.0012	.0012
				RPM	5280	4790	4300	4300	3800	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000
				IPM(FEED)	3	3	3	4	4	4	5	5	5	5	4	4	4	3	2



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
				LBS	0.5	1	1.5	2	1	2	3	1	1.5	2	2.5	3	4	1	1.5	2
P	1-8	Non-alloy steel	SFM(Vc)	105	105	95	95	155	140	140	205	205	205	185	185	185	220	220	220
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	50000	50000	45000	45000	50000	45000	45000	50000	50000	50000	45000	45000	45000	43000	43000	43000
			IPM(FEED)	7	7	6	6	8	6	6	8	8	8	6	6	6	9	9	9
			Ap	.0016	.0011	.0006	.0004	.0017	.0009	.0006	.0031	.0022	.0022	.0013	.0013	.0008	.0039	.0039	.0028
	9	Low alloy steel	SFM(Vc)	70	70	65	65	100	90	90	130	130	130	120	120	120	145	145	145
			IPT(fz)	.00004	.00004	.00004	.00004	.00005	.00005	.00005	.0001	.0001	.0001	.0000	.0000	.0000	.0001	.0001	.0001
			RPM	34500	34500	31050	31050	32000	28800	28800	32000	32000	32000	28800	28800	28800	28000	28000	28000
			IPM(FEED)	3.0	3.0	2.4	2.4	3.3	2.8	2.8	3.3	3.3	3.3	2.8	2.8	2.8	3.7	3.7	3.7
			Ap	.0012	.0008	.0005	.0003	.0013	.0007	.0004	.0024	.0017	.0017	.0009	.0009	.0006	.0030	.0030	.0021
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	105	105	95	95	155	140	140	205	205	205	185	185	185	220	220	220
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	50000	50000	45000	45000	50000	45000	45000	50000	50000	50000	45000	45000	45000	43000	43000	43000
			IPM(FEED)	7	7	6	6	8	6	6	8	8	8	6	6	6	9	9	9
			Ap	.0016	.0011	.0006	.0004	.0017	.0009	.0006	.0031	.0022	.0022	.0013	.0013	.0008	.0039	.0039	.0028
	11.2		SFM(Vc)	70	70	65	65	100	90	90	130	130	130	120	120	120	145	145	145
			IPT(fz)	.00004	.00004	.00004	.00004	.00005	.00005	.00005	.0001	.0001	.0001	.0000	.0000	.0000	.0001	.0001	.0001
			RPM	34500	34500	31050	31050	32000	28800	28800	32000	32000	32000	28800	28800	28800	28000	28000	28000
			IPM(FEED)	3.0	3.0	2.4	2.4	3.3	2.8	2.8	3.3	3.3	3.3	2.8	2.8	2.8	3.7	3.7	3.7
			Ap	.0012	.0008	.0005	.0003	.0013	.0007	.0004	.0024	.0017	.0017	.0009	.0009	.0006	.0030	.0030	.0021
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	105	105	95	95	155	140	140	205	205	205	185	185	185	220	220	220
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	50000	50000	45000	45000	50000	45000	45000	50000	50000	50000	45000	45000	45000	43000	43000	43000
			IPM(FEED)	7	7	6	6	8	6	6	8	8	8	6	6	6	9	9	9
			Ap	.0016	.0011	.0006	.0004	.0017	.0009	.0006	.0031	.0022	.0022	.0013	.0013	.0008	.0039	.0039	.0028
H	38.1-38.2	Hardened steel	SFM(Vc)	45	45	40	40	60	55	55	80	80	80	75	75	75	90	90	90
			IPT(fz)	.00004	.00004	.00004	.00004	.00005	.00004	.00004	.0001	.0001	.0001	.0000	.0000	.0000	.0001	.0001	.0001
			RPM	21150	21150	19040	19040	20000	18000	18000	20000	20000	20000	18000	18000	18000	17100	17100	17100
			IPM(FEED)	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2
			Ap	.0009	.0007	.0004	.0002	.0010	.0006	.0004	.0019	.0013	.0013	.0007	.0007	.0005	.0024	.0024	.0017
	40	Chilled Cast Iron	SFM(Vc)	70	70	65	65	100	90	90	130	130	130	120	120	120	145	145	145
			IPT(fz)	.00004	.00004	.00004	.00004	.00005	.00005	.00005	.0001	.0001	.0001	.0000	.0000	.0000	.0001	.0001	.0001
			RPM	34500	34500	31050	31050	32000	28800	28800	32000	32000	32000	28800	28800	28800	28000	28000	28000
			IPM(FEED)	3.0	3.0	2.4	2.4	3.3	2.8	2.8	3.3	3.3	3.3	2.8	2.8	2.8	3.7	3.7	3.7
			Ap	.0012	.0008	.0005	.0003	.0013	.0007	.0004	.0024	.0017	.0017	.0009	.0009	.0006	.0030	.0030	.0021
	41	Hardened Cast Iron	SFM(Vc)	45	45	40	40	60	55	55	80	80	80	75	75	75	90	90	90
			IPT(fz)	.00004	.00004	.00004	.00004	.00005	.00004	.00004	.0001	.0001	.0001	.0000	.0000	.0000	.0001	.0001	.0001
			RPM	21150	21150	19040	19040	20000	18000	18000	20000	20000	20000	18000	18000	18000	17100	17100	17100
			IPM(FEED)	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	2
			Ap	.0009	.0007	.0004	.0002	.0010	.0006	.0004	.0019	.0013	.0013	.0007	.0007	.0005	.0024	.0024	.0017

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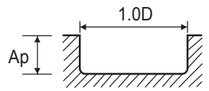

4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																
			0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8
		LBS	2.5	3	4	5	6	2	3	4	6	8	10	2	4	6	8	10	2	3
P	1-8	SFM(Vc)	220	200	200	200	175	225	225	205	205	180	135	265	235	235	210	210	300	300
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	43000	38700	38700	38700	34400	36400	36400	32760	32760	29120	21840	36400	32760	32760	29120	29120	36400	36400
		IPM(FEED)	9	7	7	7	6	10	10	8	8	6	4	10	8	8	6	6	10	10
		Ap	.0028	.0016	.0016	.0010	.0010	.0033	.0033	.0019	.0012	.0007	.0005	.0055	.0022	.0014	.0014	.0008	.0063	.0044
	9	SFM(Vc)	145	130	130	130	115	150	150	135	135	120	90	175	155	155	140	140	200	200
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	28000	25200	25200	25200	22400	24000	24000	21600	21600	19200	14400	24000	21600	21600	19200	19200	24000	24000
		IPM(FEED)	3.7	3.0	3.0	3.0	2.4	4.3	4.3	3.5	3.5	2.8	1.8	4.3	3.5	3.5	2.8	2.8	4.3	4.3
		Ap	.0021	.0012	.0012	.0007	.0007	.0025	.0025	.0014	.0009	.0006	.0004	.0041	.0017	.0010	.0010	.0006	.0047	.0033
	10-11.1	SFM(Vc)	220	200	200	200	175	225	225	205	205	180	135	265	235	235	210	210	300	300
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	43000	38700	38700	38700	34400	36400	36400	32760	32760	29120	21840	36400	32760	32760	29120	29120	36400	36400
		IPM(FEED)	9	7	7	7	6	10	10	8	8	6	4	10	8	8	6	6	10	10
		Ap	.0028	.0016	.0016	.0010	.0010	.0033	.0033	.0019	.0012	.0007	.0005	.0055	.0022	.0014	.0014	.0008	.0063	.0044
	11.2	SFM(Vc)	145	130	130	130	115	150	150	135	135	120	90	175	155	155	140	140	200	200
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	28000	25200	25200	25200	22400	24000	24000	21600	21600	19200	14400	24000	21600	21600	19200	19200	24000	24000
		IPM(FEED)	3.7	3.0	3.0	3.0	2.4	4.3	4.3	3.5	3.5	2.8	1.8	4.3	3.5	3.5	2.8	2.8	4.3	4.3
		Ap	.0021	.0012	.0012	.0007	.0007	.0025	.0025	.0014	.0009	.0006	.0004	.0041	.0017	.0010	.0010	.0006	.0047	.0033
K	15-20	SFM(Vc)	220	200	200	200	175	225	225	205	205	180	135	265	235	235	210	210	300	300
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	43000	38700	38700	38700	34400	36400	36400	32760	32760	29120	21840	36400	32760	32760	29120	29120	36400	36400
		IPM(FEED)	9	7	7	7	6	10	10	8	8	6	4	10	8	8	6	6	10	10
		Ap	.0028	.0016	.0016	.0010	.0010	.0033	.0033	.0019	.0012	.0007	.0005	.0055	.0022	.0014	.0014	.0008	.0063	.0044
H	38.1-38.2	SFM(Vc)	90	80	80	80	70	90	90	80	80	70	55	105	95	95	85	85	120	120
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	17100	15390	15390	15390	13680	14500	14500	13050	13050	11600	8700	14500	13050	13050	11600	11600	14500	14500
		IPM(FEED)	2	2	2	2	2	3	3	2	2	2	1	3	2	2	2	2	3	3
		Ap	.0017	.0009	.0009	.0006	.0006	.0020	.0020	.0011	.0007	.0004	.0003	.0033	.0013	.0008	.0008	.0005	.0038	.0026
	40	SFM(Vc)	145	130	130	130	115	150	150	135	135	120	90	175	155	155	140	140	200	200
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	28000	25200	25200	25200	22400	24000	24000	21600	21600	19200	14400	24000	21600	21600	19200	19200	24000	24000
		IPM(FEED)	3.7	3.0	3.0	3.0	2.4	4.3	4.3	3.5	3.5	2.8	1.8	4.3	3.5	3.5	2.8	2.8	4.3	4.3
		Ap	.0021	.0012	.0012	.0007	.0007	.0025	.0025	.0014	.0009	.0006	.0004	.0041	.0017	.0010	.0010	.0006	.0047	.0033
	41	SFM(Vc)	90	80	80	80	70	90	90	80	80	70	55	105	95	95	85	85	120	120
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	17100	15390	15390	15390	13680	14500	14500	13050	13050	11600	8700	14500	13050	13050	11600	11600	14500	14500
		IPM(FEED)	2	2	2	2	2	3	3	2	2	2	1	3	2	2	2	2	3	3
		Ap	.0017	.0009	.0009	.0006	.0006	.0020	.0020	.0011	.0007	.0004	.0003	.0033	.0013	.0008	.0008	.0005	.0038	.0026

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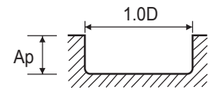

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2
				LBS	4	6	8	10	3	4	6	8	10	12	14	16	20	3	4	6
P	1-8	Non-alloy steel	SFM(Vc)	300	270	270	240	340	340	305	305	305	275	275	205	205	370	370	370
			IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	36400	32760	32760	29120	33100	33100	29790	29790	29790	26480	26480	19860	19860	29750	29750	29750
			IPM(FEED)	10	8	8	6	11	11	9	9	9	7	7	5	5	11	11	11
			Ap	.0044	.0025	.0016	.0016	.0079	.0055	.0031	.0031	.0020	.0020	.0012	.0012	.0008	.0094	.0066	.0066
	9	Low alloy steel	SFM(Vc)	200	180	180	160	225	225	200	200	200	180	180	135	135	235	235	235
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	24000	21600	21600	19200	21600	21600	19440	19440	19440	17280	17280	12960	12960	18900	18900	18900
			IPM(FEED)	4.3	3.5	3.5	2.8	4.7	4.7	3.7	3.7	3.7	3.0	3.0	2.0	2.0	4.9	4.9	4.9
			Ap	.0033	.0019	.0012	.0012	.0059	.0041	.0024	.0024	.0015	.0015	.0009	.0009	.0006	.0071	.0050	.0050
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	300	270	270	240	340	340	305	305	305	275	275	205	205	370	370	370
			IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	36400	32760	32760	29120	33100	33100	29790	29790	29790	26480	26480	19860	19860	29750	29750	29750
			IPM(FEED)	10	8	8	6	11	11	9	9	9	7	7	5	5	11	11	11
			Ap	.0044	.0025	.0016	.0016	.0079	.0055	.0031	.0031	.0020	.0020	.0012	.0012	.0008	.0094	.0066	.0066
	11.2		SFM(Vc)	200	180	180	160	225	225	200	200	200	180	180	135	135	235	235	235
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	24000	21600	21600	19200	21600	21600	19440	19440	19440	17280	17280	12960	12960	18900	18900	18900
			IPM(FEED)	4.3	3.5	3.5	2.8	4.7	4.7	3.7	3.7	3.7	3.0	3.0	2.0	2.0	4.9	4.9	4.9
			Ap	.0033	.0019	.0012	.0012	.0059	.0041	.0024	.0024	.0015	.0015	.0009	.0009	.0006	.0071	.0050	.0050
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	300	270	270	240	340	340	305	305	305	275	275	205	205	370	370	370
			IPT(fz)	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	36400	32760	32760	29120	33100	33100	29790	29790	29790	26480	26480	19860	19860	29750	29750	29750
			IPM(FEED)	10	8	8	6	11	11	9	9	9	7	7	5	5	11	11	11
			Ap	.0044	.0025	.0016	.0016	.0079	.0055	.0031	.0031	.0020	.0020	.0012	.0012	.0008	.0094	.0066	.0066
H	38.1-38.2	Hardened steel	SFM(Vc)	120	110	110	95	135	135	120	120	120	110	110	80	80	145	145	145
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	14500	13050	13050	11600	13200	13200	11880	11880	11880	10560	10560	7920	7920	11700	11700	11700
			IPM(FEED)	3	2	2	2	3	3	2	2	2	2	2	1	1	3	3	3
			Ap	.0026	.0015	.0009	.0009	.0047	.0033	.0019	.0019	.0012	.0012	.0007	.0007	.0005	.0057	.0040	.0040
	40	Chilled Cast Iron	SFM(Vc)	200	180	180	160	225	225	200	200	200	180	180	135	135	235	235	235
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	24000	21600	21600	19200	21600	21600	19440	19440	19440	17280	17280	12960	12960	18900	18900	18900
			IPM(FEED)	4.3	3.5	3.5	2.8	4.7	4.7	3.7	3.7	3.7	3.0	3.0	2.0	2.0	4.9	4.9	4.9
			Ap	.0033	.0019	.0012	.0012	.0059	.0041	.0024	.0024	.0015	.0015	.0009	.0009	.0006	.0071	.0050	.0050
	41	Hardened Cast Iron	SFM(Vc)	120	110	110	95	135	135	120	120	120	110	110	80	80	145	145	145
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	14500	13050	13050	11600	13200	13200	11880	11880	11880	10560	10560	7920	7920	11700	11700	11700
			IPM(FEED)	3	2	2	2	3	3	2	2	2	2	2	1	1	3	3	3
			Ap	.0026	.0015	.0009	.0009	.0047	.0033	.0019	.0019	.0012	.0012	.0007	.0007	.0005	.0057	.0040	.0040

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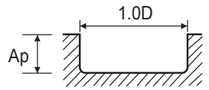

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																
			1.2	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0
		LBS	8	10	12	16	20	4	6	8	10	12	14	16	20	22	26	6	8	10
P	1-8	SFM(Vc)	330	330	330	295	220	410	410	365	365	365	365	325	325	325	245	445	445	445
		IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003
		RPM	26780	26780	26780	23800	17850	26400	26400	23760	23760	23760	23760	21120	21120	21120	15840	21600	21600	21600
		IPM(FEED)	9	9	9	7	5	12	12	10	10	10	10	7	7	7	5	12	12	12
		Ap	.0038	.0024	.0024	.0014	.0009	.0118	.0083	.0047	.0047	.0047	.0030	.0030	.0018	.0018	.0012	.0157	.0110	.0110
	9	SFM(Vc)	210	210	210	185	140	250	250	225	225	225	225	200	200	200	150	285	285	285
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
		RPM	17010	17010	17010	15120	11340	16200	16200	14580	14580	14580	14580	12960	12960	12960	9720	13800	13800	13800
		IPM(FEED)	3.9	3.9	3.9	3.1	2.2	5.1	5.1	4.1	4.1	4.1	4.1	3.3	3.3	3.3	2.2	5.5	5.5	5.5
		Ap	.0028	.0018	.0018	.0011	.0007	.0089	.0062	.0035	.0035	.0035	.0022	.0022	.0013	.0013	.0009	.0118	.0083	.0083
	10-11.1	SFM(Vc)	330	330	330	295	220	410	410	365	365	365	365	325	325	325	245	445	445	445
		IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003
		RPM	26780	26780	26780	23800	17850	26400	26400	23760	23760	23760	23760	21120	21120	21120	15840	21600	21600	21600
		IPM(FEED)	9	9	9	7	5	12	12	10	10	10	10	7	7	7	5	12	12	12
		Ap	.0038	.0024	.0024	.0014	.0009	.0118	.0083	.0047	.0047	.0047	.0030	.0030	.0018	.0018	.0012	.0157	.0110	.0110
	11.2	SFM(Vc)	210	210	210	185	140	250	250	225	225	225	225	200	200	200	150	285	285	285
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
		RPM	17010	17010	17010	15120	11340	16200	16200	14580	14580	14580	14580	12960	12960	12960	9720	13800	13800	13800
		IPM(FEED)	3.9	3.9	3.9	3.1	2.2	5.1	5.1	4.1	4.1	4.1	4.1	3.3	3.3	3.3	2.2	5.5	5.5	5.5
		Ap	.0028	.0018	.0018	.0011	.0007	.0089	.0062	.0035	.0035	.0035	.0022	.0022	.0013	.0013	.0009	.0118	.0083	.0083
K	15-20	SFM(Vc)	330	330	330	295	220	410	410	365	365	365	365	325	325	325	245	445	445	445
		IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003
		RPM	26780	26780	26780	23800	17850	26400	26400	23760	23760	23760	23760	21120	21120	21120	15840	21600	21600	21600
		IPM(FEED)	9	9	9	7	5	12	12	10	10	10	10	7	7	7	5	12	12	12
		Ap	.0038	.0024	.0024	.0014	.0009	.0118	.0083	.0047	.0047	.0047	.0030	.0030	.0018	.0018	.0012	.0157	.0110	.0110
H	38.1-38.2	SFM(Vc)	130	130	130	115	85	160	160	140	140	140	140	125	125	125	95	180	180	180
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
		RPM	10530	10530	10530	9360	7020	10200	10200	9180	9180	9180	9180	8160	8160	8160	6120	8640	8640	8640
		IPM(FEED)	2	2	2	2	1	3	3	2	2	2	2	2	2	2	1	3	3	3
		Ap	.0023	.0014	.0014	.0009	.0006	.0071	.0050	.0028	.0028	.0028	.0018	.0018	.0011	.0011	.0007	.0094	.0066	.0066
	40	SFM(Vc)	210	210	210	185	140	250	250	225	225	225	225	200	200	200	150	285	285	285
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
		RPM	17010	17010	17010	15120	11340	16200	16200	14580	14580	14580	14580	12960	12960	12960	9720	13800	13800	13800
		IPM(FEED)	3.9	3.9	3.9	3.1	2.2	5.1	5.1	4.1	4.1	4.1	4.1	3.3	3.3	3.3	2.2	5.5	5.5	5.5
		Ap	.0028	.0018	.0018	.0011	.0007	.0089	.0062	.0035	.0035	.0035	.0022	.0022	.0013	.0013	.0009	.0118	.0083	.0083
	41	SFM(Vc)	130	130	130	115	85	160	160	140	140	140	140	125	125	125	95	180	180	180
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
		RPM	10530	10530	10530	9360	7020	10200	10200	9180	9180	9180	9180	8160	8160	8160	6120	8640	8640	8640
		IPM(FEED)	2	2	2	2	1	3	3	2	2	2	2	2	2	2	1	3	3	3
		Ap	.0023	.0014	.0014	.0009	.0006	.0071	.0050	.0028	.0028	.0028	.0018	.0018	.0011	.0011	.0007	.0094	.0066	.0066

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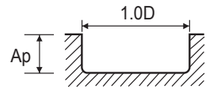

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.0
				LBS	12	14	16	20	22	26	30	8	10	12	14	16	20	26	30	8
P	1-8	Non-alloy steel	SFM(Vc)	400	400	400	400	355	355	355	465	465	465	415	415	415	370	370	490
			IPT(fz)	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0004
			RPM	19440	19440	19440	19440	17280	17280	17280	18000	18000	18000	16200	16200	16200	14400	14400	15900
			IPM(FEED)	10	10	10	10	8	8	8	13	13	13	10	10	10	8	8	13
			Ap	.0063	.0063	.0063	.0039	.0039	.0039	.0024	.0138	.0138	.0138	.0079	.0079	.0079	.0049	.0049	.0236
	9	Low alloy steel	SFM(Vc)	255	255	255	255	230	230	230	295	295	295	265	265	265	235	235	320
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0003
			RPM	12420	12420	12420	12420	11040	11040	11040	11400	11400	11400	10260	10260	10260	9120	9120	10300
			IPM(FEED)	4.5	4.5	4.5	4.5	3.5	3.5	3.5	5.9	5.9	5.9	4.7	4.7	4.7	3.7	3.7	6.3
			Ap	.0047	.0047	.0047	.0030	.0030	.0030	.0018	.0104	.0104	.0104	.0059	.0059	.0059	.0037	.0037	.0177
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	400	400	400	400	355	355	355	465	465	465	415	415	415	370	370	490
			IPT(fz)	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0004
			RPM	19440	19440	19440	19440	17280	17280	17280	18000	18000	18000	16200	16200	16200	14400	14400	15900
			IPM(FEED)	10	10	10	10	8	8	8	13	13	13	10	10	10	8	8	13
			Ap	.0063	.0063	.0063	.0039	.0039	.0039	.0024	.0138	.0138	.0138	.0079	.0079	.0079	.0049	.0049	.0236
	11.2		SFM(Vc)	255	255	255	255	230	230	230	295	295	295	265	265	265	235	235	320
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0003
			RPM	12420	12420	12420	12420	11040	11040	11040	11400	11400	11400	10260	10260	10260	9120	9120	10300
			IPM(FEED)	4.5	4.5	4.5	4.5	3.5	3.5	3.5	5.9	5.9	5.9	4.7	4.7	4.7	3.7	3.7	6.3
			Ap	.0047	.0047	.0047	.0030	.0030	.0030	.0018	.0104	.0104	.0104	.0059	.0059	.0059	.0037	.0037	.0177
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	400	400	400	400	355	355	355	465	465	465	415	415	415	370	370	490
			IPT(fz)	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0004
			RPM	19440	19440	19440	19440	17280	17280	17280	18000	18000	18000	16200	16200	16200	14400	14400	15900
			IPM(FEED)	10	10	10	10	8	8	8	13	13	13	10	10	10	8	8	13
			Ap	.0063	.0063	.0063	.0039	.0039	.0039	.0024	.0138	.0138	.0138	.0079	.0079	.0079	.0049	.0049	.0236
H	38.1-38.2	Hardened steel	SFM(Vc)	160	160	160	160	140	140	140	190	190	190	170	170	170	150	150	195
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	7780	7780	7780	7780	6910	6910	6910	7320	7320	7320	6590	6590	6590	5860	5860	6300
			IPM(FEED)	3	3	3	3	2	2	2	3	3	3	3	3	3	2	2	3
			Ap	.0038	.0038	.0038	.0024	.0024	.0024	.0014	.0083	.0083	.0083	.0047	.0047	.0047	.0030	.0030	.0142
	40	Chilled Cast Iron	SFM(Vc)	255	255	255	255	230	230	230	295	295	295	265	265	265	235	235	320
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0003
			RPM	12420	12420	12420	12420	11040	11040	11040	11400	11400	11400	10260	10260	10260	9120	9120	10300
			IPM(FEED)	4.5	4.5	4.5	4.5	3.5	3.5	3.5	5.9	5.9	5.9	4.7	4.7	4.7	3.7	3.7	6.3
			Ap	.0047	.0047	.0047	.0030	.0030	.0030	.0018	.0104	.0104	.0104	.0059	.0059	.0059	.0037	.0037	.0177
	41	Hardened Cast Iron	SFM(Vc)	160	160	160	160	140	140	140	190	190	190	170	170	170	150	150	195
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	7780	7780	7780	7780	6910	6910	6910	7320	7320	7320	6590	6590	6590	5860	5860	6300
			IPM(FEED)	3	3	3	3	2	2	2	3	3	3	3	3	3	2	2	3
			Ap	.0038	.0038	.0038	.0024	.0024	.0024	.0014	.0083	.0083	.0083	.0047	.0047	.0047	.0030	.0030	.0142

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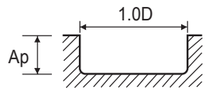

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS
SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																
			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
		LBS	10	12	14	16	20	26	30	35	40	10	12	14	16	20	26	30	35	40
P	1-8	SFM(Vc)	490	490	490	440	440	440	440	395	395	530	530	530	530	530	475	475	475	475
		IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006
		RPM	15900	15900	15900	14310	14310	14310	14310	12720	12720	12800	12800	12800	12800	12800	11520	11520	11520	11520
		IPM(FEED)	13	13	13	10	10	10	10	8	8	16	16	16	16	16	13	13	13	13
		Ap	.0165	.0165	.0165	.0094	.0094	.0059	.0059	.0059	.0035	.0315	.0315	.0220	.0220	.0220	.0126	.0126	.0079	.0079
	9	SFM(Vc)	320	320	320	285	285	285	285	255	255	340	340	340	340	340	305	305	305	305
		IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004
		RPM	10300	10300	10300	9270	9270	9270	9270	8240	8240	8200	8200	8200	8200	8200	7380	7380	7380	7380
		IPM(FEED)	6.3	6.3	6.3	5.1	5.1	5.1	5.1	3.9	3.9	7.9	7.9	7.9	7.9	7.9	6.3	6.3	6.3	6.3
		Ap	.0124	.0124	.0124	.0071	.0071	.0044	.0044	.0044	.0027	.0236	.0236	.0165	.0165	.0165	.0094	.0094	.0059	.0059
	10-11.1	SFM(Vc)	490	490	490	440	440	440	440	395	395	530	530	530	530	530	475	475	475	475
		IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006
		RPM	15900	15900	15900	14310	14310	14310	14310	12720	12720	12800	12800	12800	12800	12800	11520	11520	11520	11520
		IPM(FEED)	13	13	13	10	10	10	10	8	8	16	16	16	16	16	13	13	13	13
		Ap	.0165	.0165	.0165	.0094	.0094	.0059	.0059	.0059	.0035	.0315	.0315	.0220	.0220	.0220	.0126	.0126	.0079	.0079
	11.2	SFM(Vc)	320	320	320	285	285	285	285	255	255	340	340	340	340	340	305	305	305	305
		IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004
		RPM	10300	10300	10300	9270	9270	9270	9270	8240	8240	8200	8200	8200	8200	8200	7380	7380	7380	7380
		IPM(FEED)	6.3	6.3	6.3	5.1	5.1	5.1	5.1	3.9	3.9	7.9	7.9	7.9	7.9	7.9	6.3	6.3	6.3	6.3
		Ap	.0124	.0124	.0124	.0071	.0071	.0044	.0044	.0044	.0027	.0236	.0236	.0165	.0165	.0165	.0094	.0094	.0059	.0059
K	15-20	SFM(Vc)	490	490	490	440	440	440	440	395	395	530	530	530	530	530	475	475	475	475
		IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006	.0006
		RPM	15900	15900	15900	14310	14310	14310	14310	12720	12720	12800	12800	12800	12800	12800	11520	11520	11520	11520
		IPM(FEED)	13	13	13	10	10	10	10	8	8	16	16	16	16	16	13	13	13	13
		Ap	.0165	.0165	.0165	.0094	.0094	.0059	.0059	.0059	.0035	.0315	.0315	.0220	.0220	.0220	.0126	.0126	.0079	.0079
H	38.1-38.2	SFM(Vc)	195	195	195	175	175	175	175	155	155	210	210	210	210	210	190	190	190	190
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
		RPM	6300	6300	6300	5670	5670	5670	5670	5040	5040	5150	5150	5150	5150	5150	4640	4640	4640	4640
		IPM(FEED)	3	3	3	3	3	3	3	2	2	4	4	4	4	4	3	3	3	3
		Ap	.0099	.0099	.0099	.0057	.0057	.0035	.0035	.0035	.0021	.0189	.0189	.0132	.0132	.0132	.0076	.0076	.0047	.0047
	40	SFM(Vc)	320	320	320	285	285	285	285	255	255	340	340	340	340	340	305	305	305	305
		IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0004	.0004
		RPM	10300	10300	10300	9270	9270	9270	9270	8240	8240	8200	8200	8200	8200	8200	7380	7380	7380	7380
		IPM(FEED)	6.3	6.3	6.3	5.1	5.1	5.1	5.1	3.9	3.9	7.9	7.9	7.9	7.9	7.9	6.3	6.3	6.3	6.3
		Ap	.0124	.0124	.0124	.0071	.0071	.0044	.0044	.0044	.0027	.0236	.0236	.0165	.0165	.0165	.0094	.0094	.0059	.0059
	41	SFM(Vc)	195	195	195	175	175	175	175	155	155	210	210	210	210	210	190	190	190	190
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
		RPM	6300	6300	6300	5670	5670	5670	5670	5040	5040	5150	5150	5150	5150	5150	4640	4640	4640	4640
		IPM(FEED)	3	3	3	3	3	3	3	2	2	4	4	4	4	4	3	3	3	3
		Ap	.0099	.0099	.0099	.0057	.0057	.0035	.0035	.0035	.0021	.0189	.0189	.0132	.0132	.0132	.0076	.0076	.0047	.0047

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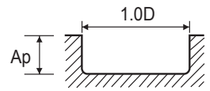
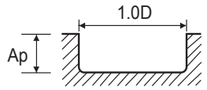


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME61 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				4.0	4.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0	12.0	12.0	16.0	16.0	20.0	20.0
			LBS	45	50	15	20	30	25	35	30	40	32	45	35	50	40	55
P	1-8	Non-alloy steel	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620
			IPT(fz)	.0005	.0005	.0009	.0012	.0012	.0017	.0017	.0021	.0021	.0020	.0020	.0024	.0024	.0022	.0022
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000
			IPM(FEED)	10	10	20	24	24	25	25	25	25	20	20	18	18	13	13
			Ap	.0079	.0079	.0394	.0331	.0331	.0441	.0441	.0787	.0551	.0945	.0661	.1260	.0882	.1575	.1575
	9	Low alloy steel	SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400
			IPT(fz)	.0004	.0004	.0007	.0010	.0010	.0013	.0013	.0015	.0015	.0016	.0016	.0016	.0016	.0014	.0014
			RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950
			IPM(FEED)	5.1	5.1	9.4	11.8	11.8	11.8	11.8	11.8	11.8	10.6	10.6	8.3	8.3	5.5	5.5
			Ap	.0059	.0059	.0295	.0248	.0248	.0331	.0331	.0591	.0413	.0709	.0496	.0945	.0661	.1181	.1181
	10-11.1	High alloyed steel, and tool steel	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620
			IPT(fz)	.0005	.0005	.0009	.0012	.0012	.0017	.0017	.0021	.0021	.0020	.0020	.0024	.0024	.0022	.0022
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000
			IPM(FEED)	10	10	20	24	24	25	25	25	25	20	20	18	18	13	13
			Ap	.0079	.0079	.0394	.0331	.0331	.0441	.0441	.0787	.0551	.0945	.0661	.1260	.0882	.1575	.1575
	11.2		SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400
			IPT(fz)	.0004	.0004	.0007	.0010	.0010	.0013	.0013	.0015	.0015	.0016	.0016	.0016	.0016	.0014	.0014
			RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950
			IPM(FEED)	5.1	5.1	9.4	11.8	11.8	11.8	11.8	11.8	11.8	10.6	10.6	8.3	8.3	5.5	5.5
			Ap	.0059	.0059	.0295	.0248	.0248	.0331	.0331	.0591	.0413	.0709	.0496	.0945	.0661	.1181	.1181
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620
			IPT(fz)	.0005	.0005	.0009	.0012	.0012	.0017	.0017	.0021	.0021	.0020	.0020	.0024	.0024	.0022	.0022
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000
			IPM(FEED)	10	10	20	24	24	25	25	25	25	20	20	18	18	13	13
			Ap	.0079	.0079	.0394	.0331	.0331	.0441	.0441	.0787	.0551	.0945	.0661	.1260	.0882	.1575	.1575
H	38.1-38.2	Hardened steel	SFM(Vc)	170	170	235	245	245	250	250	250	250	245	245	255	255	245	245
			IPT(fz)	.0003	.0003	.0005	.0007	.0007	.0009	.0009	.0011	.0011	.0012	.0012	.0012	.0012	.0011	.0011
			RPM	4120	4120	4560	3930	3930	3020	3020	2420	2420	2000	2000	1540	1540	1200	1200
			IPM(FEED)	2	2	5	6	6	6	6	6	6	5	5	4	4	3	3
			Ap	.0047	.0047	.0236	.0198	.0198	.0265	.0265	.0472	.0331	.0567	.0397	.0756	.0529	.0945	.0945
	40	Chilled Cast Iron	SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400
			IPT(fz)	.0004	.0004	.0007	.0010	.0010	.0013	.0013	.0015	.0015	.0016	.0016	.0016	.0016	.0014	.0014
			RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950
			IPM(FEED)	5.1	5.1	9.4	11.8	11.8	11.8	11.8	11.8	11.8	10.6	10.6	8.3	8.3	5.5	5.5
			Ap	.0059	.0059	.0295	.0248	.0248	.0331	.0331	.0591	.0413	.0709	.0496	.0945	.0661	.1181	.1181
	41	Hardened Cast Iron	SFM(Vc)	170	170	235	245	245	250	250	250	250	245	245	255	255	245	245
			IPT(fz)	.0003	.0003	.0005	.0007	.0007	.0009	.0009	.0011	.0011	.0012	.0012	.0012	.0012	.0011	.0011
			RPM	4120	4120	4560	3930	3930	3020	3020	2420	2420	2000	2000	1540	1540	1200	1200
			IPM(FEED)	2	2	5	6	6	6	6	6	6	5	5	4	4	3	3
			Ap	.0047	.0047	.0236	.0198	.0198	.0265	.0265	.0472	.0331	.0567	.0397	.0756	.0529	.0945	.0945



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME01 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
P	1-8	Non-alloy steel	0.05D	2.0D	SFM(Vc)	285	305	340	370	385	410	430	440	460	470
					IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005
					RPM	27600	24800	22000	18000	15000	13240	11980	10720	9940	9160
					IPM(FEED)	12	12	12	13	13	13	15	17	17	17
	9	Low alloy steel	0.05D	2.0D	SFM(Vc)	185	195	210	240	245	265	275	280	295	300
					IPT(fz)	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006
					RPM	18000	15750	13500	11560	9500	8560	7690	6820	6310	5800
					IPM(FEED)	9	9	9	9	10	10	11	12	13	14
	10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	285	305	340	370	385	410	430	440	460	470
					IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005
					RPM	27600	24800	22000	18000	15000	13240	11980	10720	9940	9160
					IPM(FEED)	12	12	12	13	13	13	15	17	17	17
	11.2		0.05D	2.0D	SFM(Vc)	185	195	210	240	245	265	275	280	295	300
					IPT(fz)	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006
					RPM	18000	15750	13500	11560	9500	8560	7690	6820	6310	5800
					IPM(FEED)	9	9	9	9	10	10	11	12	13	14
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.0D	SFM(Vc)	285	305	340	370	385	410	430	440	460	470
					IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005
					RPM	27600	24800	22000	18000	15000	13240	11980	10720	9940	9160
					IPM(FEED)	12	12	12	13	13	13	15	17	17	17
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	115	120	130	150	155	165	175	175	190	195
					IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	11000	9750	8500	7200	6100	5280	4790	4300	4050	3800
					IPM(FEED)	5	5	5	5	5	5	5	6	6	7
	40	Chilled Cast Iron	0.05D	2.0D	SFM(Vc)	185	195	210	240	245	265	275	280	295	300
					IPT(fz)	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006
					RPM	18000	15750	13500	11560	9500	8560	7690	6820	6310	5800
					IPM(FEED)	9	9	9	9	10	10	11	12	13	14
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	115	120	130	150	155	165	175	175	190	195
					IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0004	.0004
					RPM	11000	9750	8500	7200	6100	5280	4790	4300	4050	3800
					IPM(FEED)	5	5	5	5	5	5	5	6	6	7

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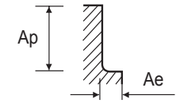


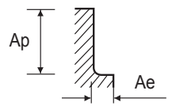
* 16mm, axial cutting depth should be 1.5xD

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME01 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 5.5	6.0	7.0	8.0	10.0	11.0	12.0	14.0	16.0	20.0
P	1-8	Non-alloy steel	0.05D	2.0D	SFM(Vc)	485	490	500	495	520	520	510	520	510	520
					IPT(fz)	.0005	.0005	.0006	.0008	.0009	.0009	.0009	.0009	.0009	.0009
					RPM	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
					IPM(FEED)	17	17	18	18	18	16	14	13	11	9
	9	Low alloy steel	0.05D	2.0D	SFM(Vc)	305	310	320	315	340	345	345	350	345	340
					IPT(fz)	.0007	.0007	.0008	.0009	.0011	.0011	.0011	.0011	.0011	.0011
					RPM	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
					IPM(FEED)	14	14	14	14	14	13	13	11	9	7
	10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	485	490	500	495	520	520	510	520	510	520
					IPT(fz)	.0005	.0005	.0006	.0008	.0009	.0009	.0009	.0009	.0009	.0009
					RPM	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
					IPM(FEED)	17	17	18	18	18	16	14	13	11	9
	11.2		0.05D	2.0D	SFM(Vc)	305	310	320	315	340	345	345	350	345	340
					IPT(fz)	.0007	.0007	.0008	.0009	.0011	.0011	.0011	.0011	.0011	.0011
					RPM	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
					IPM(FEED)	14	14	14	14	14	13	13	11	9	7
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.0D	SFM(Vc)	485	490	500	495	520	520	510	520	510	520
					IPT(fz)	.0005	.0005	.0006	.0008	.0009	.0009	.0009	.0009	.0009	.0009
					RPM	8530	7900	6950	6000	5040	4580	4120	3610	3100	2520
					IPM(FEED)	17	17	18	18	18	16	14	13	11	9
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	200	205	210	210	210	210	210	215	210	205
					IPT(fz)	.0005	.0005	.0006	.0007	.0008	.0008	.0008	.0008	.0009	.0009
					RPM	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000
					IPM(FEED)	7	7	7	7	7	6	6	5	5	4
	40	Chilled Cast Iron	0.05D	2.0D	SFM(Vc)	305	310	320	315	340	345	345	350	345	340
					IPT(fz)	.0007	.0007	.0008	.0009	.0011	.0011	.0011	.0011	.0011	.0011
					RPM	5420	5040	4420	3800	3280	3030	2780	2440	2100	1640
					IPM(FEED)	14	14	14	14	14	13	13	11	9	7
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	200	205	210	210	210	210	210	215	210	205
					IPT(fz)	.0005	.0005	.0006	.0007	.0008	.0008	.0008	.0008	.0009	.0009
					RPM	3540	3280	2900	2520	2020	1850	1680	1480	1280	1000
					IPM(FEED)	7	7	7	7	7	6	6	5	5	4



* 16mm, axial cutting depth should be 1.5xD

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 1	1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
			LBS	4	6	8	10	12	16	20	22	26	3	4	6	8	10	12	16
P	1-8	Non-alloy steel	SFM(Vc)	340	305	305	305	275	205	205	100	100	370	370	370	330	330	330	295
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	33100	29790	29790	29790	26480	19860	19860	9930	9930	29750	29750	29750	26780	26780	26780	23800
			IPM(FEED)	14	11	11	11	9	6	6	3	3	14	14	14	12	12	12	9
			Ae	.0008	.0005	.0005	.0003	.0003	.0002	.0001	.0001	.0001	.0014	.0010	.0010	.0006	.0004	.0004	.0002
	9	Low alloy steel	SFM(Vc)	225	200	200	200	180	135	135	65	65	235	235	235	210	210	210	185
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	21600	19440	19440	19440	17280	12960	12960	6480	6480	18900	18900	18900	17010	17010	17010	15120
			IPM(FEED)	10	8	8	8	7	4	4	2	2	10	10	10	9	9	9	7
			Ae	.0006	.0004	.0004	.0002	.0002	.0001	.0001	.0001	.0001	.0011	.0007	.0007	.0004	.0003	.0003	.0002
	10	High alloyed steel, and tool steel	SFM(Vc)	340	305	305	305	275	205	205	100	100	370	370	370	330	330	330	295
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	33100	29790	29790	29790	26480	19860	19860	9930	9930	29750	29750	29750	26780	26780	26780	23800
			IPM(FEED)	14	11	11	11	9	6	6	3	3	14	14	14	12	12	12	9
			Ae	.0008	.0005	.0005	.0003	.0003	.0002	.0001	.0001	.0001	.0014	.0010	.0010	.0006	.0004	.0004	.0002
	11.1-11.2		SFM(Vc)	225	200	200	200	180	135	135	65	65	235	235	235	210	210	210	185
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	21600	19440	19440	19440	17280	12960	12960	6480	6480	18900	18900	18900	17010	17010	17010	15120
			IPM(FEED)	10	8	8	8	7	4	4	2	2	10	10	10	9	9	9	7
			Ae	.0006	.0004	.0004	.0002	.0002	.0001	.0001	.0001	.0001	.0011	.0007	.0007	.0004	.0003	.0003	.0002
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	340	305	305	305	275	205	205	100	100	370	370	370	330	330	330	295
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	33100	29790	29790	29790	26480	19860	19860	9930	9930	29750	29750	29750	26780	26780	26780	23800
			IPM(FEED)	14	11	11	11	9	6	6	3	3	14	14	14	12	12	12	9
			Ae	.0008	.0005	.0005	.0003	.0003	.0002	.0001	.0001	.0001	.0014	.0010	.0010	.0006	.0004	.0004	.0002
H	38.1-38.2	Hardened steel	SFM(Vc)	135	120	120	120	110	80	80	40	40	145	145	145	130	130	130	115
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	13200	11880	11880	11880	10560	7920	7920	3960	3960	11700	11700	11700	10530	10530	10530	9360
			IPM(FEED)	6	5	5	5	4	2	2	1	1	6	6	6	5	5	5	4
			Ae	.0005	.0003	.0003	.0002	.0002	.0001	.0001	.0001	.0001	.0009	.0006	.0006	.0004	.0002	.0002	.0001
	40	Chilled Cast Iron	SFM(Vc)	225	200	200	200	180	135	135	65	65	235	235	235	210	210	210	185
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	21600	19440	19440	19440	17280	12960	12960	6480	6480	18900	18900	18900	17010	17010	17010	15120
			IPM(FEED)	10	8	8	8	7	4	4	2	2	10	10	10	9	9	9	7
			Ae	.0006	.0004	.0004	.0002	.0002	.0001	.0001	.0001	.0001	.0011	.0007	.0007	.0004	.0003	.0003	.0002
	41	Hardened Cast Iron	SFM(Vc)	135	120	120	120	110	80	80	40	40	145	145	145	130	130	130	115
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	13200	11880	11880	11880	10560	7920	7920	3960	3960	11700	11700	11700	10530	10530	10530	9360
			IPM(FEED)	6	5	5	5	4	2	2	1	1	6	6	6	5	5	5	4
			Ae	.0005	.0003	.0003	.0002	.0002	.0001	.0001	.0001	.0001	.0009	.0006	.0006	.0004	.0002	.0002	.0001

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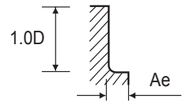

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2
			LBS	20	4	6	8	10	12	14	16	20	22	26	6	8	10	12	14
P	1-8	Non-alloy steel	SFM(Vc)	220	410	410	365	365	365	365	325	325	325	245	445	445	445	400	400
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	17850	26400	26400	23760	23760	23760	23760	21120	21120	21120	15840	21600	21600	21600	19440	19440
			IPM(FEED)	6	15	15	12	12	12	12	9	9	9	6	15	15	15	12	12
			Ae	.0002	.0018	.0013	.0007	.0007	.0007	.0004	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
	9	Low alloy steel	SFM(Vc)	140	250	250	225	225	225	225	200	200	200	150	285	285	285	255	255
			IPT(fz)	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	11340	16200	16200	14580	14580	14580	14580	12960	12960	12960	9720	13800	13800	13800	12420	12420
			IPM(FEED)	4	11	11	9	9	9	9	7	7	7	5	11	11	11	9	9
			Ae	.0001	.0013	.0009	.0006	.0006	.0006	.0003	.0003	.0002	.0002	.0001	.0018	.0013	.0013	.0007	.0007
	10	High alloyed steel, and tool steel	SFM(Vc)	220	410	410	365	365	365	365	325	325	325	245	445	445	445	400	400
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	17850	26400	26400	23760	23760	23760	23760	21120	21120	21120	15840	21600	21600	21600	19440	19440
			IPM(FEED)	6	15	15	12	12	12	12	9	9	9	6	15	15	15	12	12
			Ae	.0002	.0018	.0013	.0007	.0007	.0007	.0004	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
	11.1-11.2		SFM(Vc)	140	250	250	225	225	225	225	200	200	200	150	285	285	285	255	255
			IPT(fz)	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	11340	16200	16200	14580	14580	14580	14580	12960	12960	12960	9720	13800	13800	13800	12420	12420
			IPM(FEED)	4	11	11	9	9	9	9	7	7	7	5	11	11	11	9	9
			Ae	.0001	.0013	.0009	.0006	.0006	.0006	.0003	.0003	.0002	.0002	.0001	.0018	.0013	.0013	.0007	.0007
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	220	410	410	365	365	365	365	325	325	325	245	445	445	445	400	400
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	17850	26400	26400	23760	23760	23760	23760	21120	21120	21120	15840	21600	21600	21600	19440	19440
			IPM(FEED)	6	15	15	12	12	12	12	9	9	9	6	15	15	15	12	12
			Ae	.0002	.0018	.0013	.0007	.0007	.0007	.0004	.0004	.0003	.0003	.0002	.0024	.0017	.0017	.0009	.0009
H	38.1-38.2	Hardened steel	SFM(Vc)	85	160	160	140	140	140	140	125	125	125	95	180	180	180	160	160
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	7020	10200	10200	9180	9180	9180	9180	8160	8160	8160	6120	8640	8640	8640	7780	7780
			IPM(FEED)	2	6	6	5	5	5	5	4	4	4	2	6	6	6	5	5
			Ae	.0001	.0011	.0007	.0004	.0004	.0004	.0003	.0003	.0002	.0002	.0001	.0014	.0010	.0010	.0006	.0006
	40	Chilled Cast Iron	SFM(Vc)	140	250	250	225	225	225	225	200	200	200	150	285	285	285	255	255
			IPT(fz)	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	11340	16200	16200	14580	14580	14580	14580	12960	12960	12960	9720	13800	13800	13800	12420	12420
			IPM(FEED)	4	11	11	9	9	9	9	7	7	7	5	11	11	11	9	9
			Ae	.0001	.0013	.0009	.0006	.0006	.0006	.0003	.0003	.0002	.0002	.0001	.0018	.0013	.0013	.0007	.0007
	41	Hardened Cast Iron	SFM(Vc)	85	160	160	140	140	140	140	125	125	125	95	180	180	180	160	160
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002
			RPM	7020	10200	10200	9180	9180	9180	9180	8160	8160	8160	6120	8640	8640	8640	7780	7780
			IPM(FEED)	2	6	6	5	5	5	5	4	4	4	2	6	6	6	5	5
			Ae	.0001	.0011	.0007	.0004	.0004	.0004	.0003	.0003	.0002	.0002	.0001	.0014	.0010	.0010	.0006	.0006

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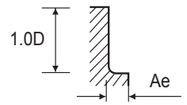

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	
			LBS	16	20	22	26	30	8	10	12	14	16	20	26	30	8	10	12
P	1-8	Non-alloy steel	SFM(Vc)	400	400	355	355	355	465	465	465	415	415	415	370	370	490	490	490
			IPT(fz)	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	19440	19440	17280	17280	17280	18000	18000	18000	16200	16200	16200	14400	14400	15900	15900	15900
			IPM(FEED)	12	12	10	10	10	15	15	15	12	12	12	10	10	16	16	16
			Ae	.0009	.0006	.0006	.0006	.0004	.0021	.0021	.0021	.0012	.0012	.0012	.0007	.0007	.0035	.0025	.0025
	9	Low alloy steel	SFM(Vc)	255	255	230	230	230	295	295	295	265	265	265	235	235	320	320	320
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003
			RPM	12420	12420	11040	11040	11040	11400	11400	11400	10260	10260	10260	9120	9120	10300	10300	10300
			IPM(FEED)	9	9	7	7	7	12	12	12	10	10	10	8	8	12	12	12
			Ae	.0007	.0004	.0004	.0004	.0003	.0015	.0015	.0015	.0009	.0009	.0009	.0006	.0006	.0027	.0019	.0019
	10	High alloyed steel, and tool steel	SFM(Vc)	400	400	355	355	355	465	465	465	415	415	415	370	370	490	490	490
			IPT(fz)	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	19440	19440	17280	17280	17280	18000	18000	18000	16200	16200	16200	14400	14400	15900	15900	15900
			IPM(FEED)	12	12	10	10	10	15	15	15	12	12	12	10	10	16	16	16
			Ae	.0009	.0006	.0006	.0006	.0004	.0021	.0021	.0021	.0012	.0012	.0012	.0007	.0007	.0035	.0025	.0025
	11.1-11.2		SFM(Vc)	255	255	230	230	230	295	295	295	265	265	265	235	235	320	320	320
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003
			RPM	12420	12420	11040	11040	11040	11400	11400	11400	10260	10260	10260	9120	9120	10300	10300	10300
			IPM(FEED)	9	9	7	7	7	12	12	12	10	10	10	8	8	12	12	12
			Ae	.0007	.0004	.0004	.0004	.0003	.0015	.0015	.0015	.0009	.0009	.0009	.0006	.0006	.0027	.0019	.0019
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	400	400	355	355	355	465	465	465	415	415	415	370	370	490	490	490
			IPT(fz)	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	19440	19440	17280	17280	17280	18000	18000	18000	16200	16200	16200	14400	14400	15900	15900	15900
			IPM(FEED)	12	12	10	10	10	15	15	15	12	12	12	10	10	16	16	16
			Ae	.0009	.0006	.0006	.0006	.0004	.0021	.0021	.0021	.0012	.0012	.0012	.0007	.0007	.0035	.0025	.0025
H	38.1-38.2	Hardened steel	SFM(Vc)	160	160	140	140	140	190	190	190	170	170	170	150	150	195	195	195
			IPT(fz)	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	7780	7780	6910	6910	6910	7320	7320	7320	6590	6590	6590	5860	5860	6300	6300	6300
			IPM(FEED)	5	5	4	4	4	6	6	6	5	5	5	4	4	6	6	6
			Ae	.0006	.0004	.0004	.0004	.0002	.0013	.0013	.0013	.0007	.0007	.0007	.0004	.0004	.0021	.0015	.0015
	40	Chilled Cast Iron	SFM(Vc)	255	255	230	230	230	295	295	295	265	265	265	235	235	320	320	320
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003
			RPM	12420	12420	11040	11040	11040	11400	11400	11400	10260	10260	10260	9120	9120	10300	10300	10300
			IPM(FEED)	9	9	7	7	7	12	12	12	10	10	10	8	8	12	12	12
			Ae	.0007	.0004	.0004	.0004	.0003	.0015	.0015	.0015	.0009	.0009	.0009	.0006	.0006	.0027	.0019	.0019
	41	Hardened Cast Iron	SFM(Vc)	160	160	140	140	140	190	190	190	170	170	170	150	150	195	195	195
			IPT(fz)	.0002	.0002	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	7780	7780	6910	6910	6910	7320	7320	7320	6590	6590	6590	5860	5860	6300	6300	6300
			IPM(FEED)	5	5	4	4	4	6	6	6	5	5	5	4	4	6	6	6
			Ae	.0006	.0004	.0004	.0004	.0002	.0013	.0013	.0013	.0007	.0007	.0007	.0004	.0004	.0021	.0015	.0015

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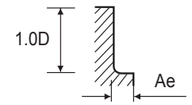

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4
			LBS	14	16	20	26	30	35	40	10	12	14	16	20	26	30	35	40
P	1-8	Non-alloy steel	SFM(Vc)	490	440	440	440	440	395	395	530	530	530	530	530	475	475	475	475
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	15900	14310	14310	14310	14310	12720	12720	12800	12800	12800	12800	12800	11520	11520	11520	11520
			IPM(FEED)	16	13	13	13	13	10	10	20	20	20	20	20	16	16	16	16
			Ae	.0025	.0014	.0014	.0009	.0009	.0009	.0006	.0047	.0047	.0033	.0033	.0033	.0019	.0019	.0012	.0012
	9	Low alloy steel	SFM(Vc)	320	285	285	285	285	255	255	340	340	340	340	340	305	305	305	305
			IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	10300	9270	9270	9270	9270	8240	8240	8200	8200	8200	8200	8200	7380	7380	7380	7380
			IPM(FEED)	12	10	10	10	10	8	8	14	14	14	14	14	11	11	11	11
			Ae	.0019	.0011	.0011	.0007	.0007	.0007	.0004	.0035	.0035	.0025	.0025	.0025	.0014	.0014	.0009	.0009
	10	High alloyed steel, and tool steel	SFM(Vc)	490	440	440	440	440	395	395	530	530	530	530	530	475	475	475	475
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	15900	14310	14310	14310	14310	12720	12720	12800	12800	12800	12800	12800	11520	11520	11520	11520
			IPM(FEED)	16	13	13	13	13	10	10	20	20	20	20	20	16	16	16	16
			Ae	.0025	.0014	.0014	.0009	.0009	.0009	.0006	.0047	.0047	.0033	.0033	.0033	.0019	.0019	.0012	.0012
	11.1-11.2		SFM(Vc)	320	285	285	285	285	255	255	340	340	340	340	340	305	305	305	305
			IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	10300	9270	9270	9270	9270	8240	8240	8200	8200	8200	8200	8200	7380	7380	7380	7380
			IPM(FEED)	12	10	10	10	10	8	8	14	14	14	14	14	11	11	11	11
			Ae	.0019	.0011	.0011	.0007	.0007	.0007	.0004	.0035	.0035	.0025	.0025	.0025	.0014	.0014	.0009	.0009
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	490	440	440	440	440	395	395	530	530	530	530	530	475	475	475	475
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003
			RPM	15900	14310	14310	14310	14310	12720	12720	12800	12800	12800	12800	12800	11520	11520	11520	11520
			IPM(FEED)	16	13	13	13	13	10	10	20	20	20	20	20	16	16	16	16
			Ae	.0025	.0014	.0014	.0009	.0009	.0009	.0006	.0047	.0047	.0033	.0033	.0033	.0019	.0019	.0012	.0012
H	38.1-38.2	Hardened steel	SFM(Vc)	195	175	175	175	175	155	155	210	210	210	210	210	190	190	190	190
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	6300	5670	5670	5670	5670	5040	5040	5150	5150	5150	5150	5150	4640	4640	4640	4640
			IPM(FEED)	6	5	5	5	5	4	4	6	6	6	6	6	5	5	5	5
			Ae	.0015	.0009	.0009	.0006	.0006	.0006	.0003	.0028	.0028	.0020	.0020	.0020	.0011	.0011	.0007	.0007
	40	Chilled Cast Iron	SFM(Vc)	320	285	285	285	285	255	255	340	340	340	340	340	305	305	305	305
			IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004	.0004
			RPM	10300	9270	9270	9270	9270	8240	8240	8200	8200	8200	8200	8200	7380	7380	7380	7380
			IPM(FEED)	12	10	10	10	10	8	8	14	14	14	14	14	11	11	11	11
			Ae	.0019	.0011	.0011	.0007	.0007	.0007	.0004	.0035	.0035	.0025	.0025	.0025	.0014	.0014	.0009	.0009
	41	Hardened Cast Iron	SFM(Vc)	195	175	175	175	175	155	155	210	210	210	210	210	190	190	190	190
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	6300	5670	5670	5670	5670	5040	5040	5150	5150	5150	5150	5150	4640	4640	4640	4640
			IPM(FEED)	6	5	5	5	5	4	4	6	6	6	6	6	5	5	5	5
			Ae	.0015	.0009	.0009	.0006	.0006	.0006	.0003	.0028	.0028	.0020	.0020	.0020	.0011	.0011	.0007	.0007

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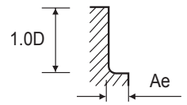
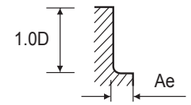


4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
SEME64 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				4	4	5	6	6	8	8	10	10	12	12	16	16	20	20	
			LBS	45	50	15	20	30	25	35	30	40	32	45	35	50	40	55	
P	1-8	Non-alloy steel	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620	
			IPT(fz)	.0003	.0003	.0005	.0005	.0005	.0008	.0008	.0009	.0009	.0008	.0008	.0009	.0009	.0009	.0009	
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000	
			IPM(FEED)	13	13	20	20	20	22	22	22	22	17	17	13	13	11	11	
			Ae	.0012	.0012	.0059	.0050	.0050	.0066	.0066	.0118	.0083	.0142	.0099	.0189	.0132	.0236	.0236	
	9	Low alloy steel	SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400	
			IPT(fz)	.0003	.0003	.0006	.0007	.0007	.0009	.0009	.0011	.0011	.0011	.0011	.0011	.0011	.0011	.0011	
			RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950	
			IPM(FEED)	9	9	17	17	17	17	17	17	17	15	15	11	11	8	8	
			Ae	.0009	.0009	.0044	.0037	.0037	.0050	.0050	.0089	.0062	.0106	.0074	.0142	.0099	.0177	.0177	
	10	High alloyed steel, and tool steel	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620	
			IPT(fz)	.0003	.0003	.0005	.0005	.0005	.0008	.0008	.0009	.0009	.0008	.0008	.0009	.0009	.0009	.0009	
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000	
			IPM(FEED)	13	13	20	20	20	22	22	22	22	17	17	13	13	11	11	
			Ae	.0012	.0012	.0059	.0050	.0050	.0066	.0066	.0118	.0083	.0142	.0099	.0189	.0132	.0236	.0236	
	11.1-11.2		SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400	
			IPT(fz)	.0003	.0003	.0006	.0007	.0007	.0009	.0009	.0011	.0011	.0011	.0011	.0011	.0011	.0011	.0011	
			RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950	
			IPM(FEED)	9	9	17	17	17	17	17	17	17	15	15	11	11	8	8	
			Ae	.0009	.0009	.0044	.0037	.0037	.0050	.0050	.0089	.0062	.0106	.0074	.0142	.0099	.0177	.0177	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	420	420	565	585	585	595	595	620	620	620	620	615	615	620	620	
			IPT(fz)	.0003	.0003	.0005	.0005	.0005	.0008	.0008	.0009	.0009	.0008	.0008	.0009	.0009	.0009	.0009	
			RPM	10240	10240	11000	9500	9500	7200	7200	6000	6000	5000	5000	3720	3720	3000	3000	
			IPM(FEED)	13	13	20	20	20	22	22	22	22	17	17	13	13	11	11	
			Ae	.0012	.0012	.0059	.0050	.0050	.0066	.0066	.0118	.0083	.0142	.0099	.0189	.0132	.0236	.0236	
H	38.1-38.2	Hardened steel	SFM(Vc)	170	170	235	245	245	250	250	250	250	245	245	255	255	245	245	
			IPT(fz)	.0002	.0002	.0004	.0005	.0005	.0007	.0007	.0008	.0008	.0008	.0008	.0009	.0009	.0008	.0008	
			RPM	4120	4120	4560	3930	3930	3020	3020	2420	2420	2000	2000	1540	1540	1200	1200	
			IPM(FEED)	4	4	8	8	8	8	8	8	8	6	6	5	5	4	4	
			Ae	.0007	.0007	.0035	.0030	.0030	.0040	.0040	.0071	.0050	.0085	.0059	.0113	.0080	.0142	.0142	
	40	Chilled Cast Iron	SFM(Vc)	270	270	360	370	370	375	375	410	410	415	415	415	415	400	400	
			IPT(fz)	.0003	.0003	.0006	.0007	.0007	.0009	.0009	.0011	.0011	.0011	.0011	.0011	.0011	.0011	.0011	
			RPM	6560	6560	7000	6000	6000	4550	4550	4000	4000	3340	3340	2520	2520	1950	1950	
			IPM(FEED)	9	9	17	17	17	17	17	17	17	15	15	11	11	8	8	
			Ae	.0009	.0009	.0044	.0037	.0037	.0050	.0050	.0089	.0062	.0106	.0074	.0142	.0099	.0177	.0177	
	41	Hardened Cast Iron	SFM(Vc)	170	170	235	245	245	250	250	250	250	245	245	255	255	245	245	
			IPT(fz)	.0002	.0002	.0004	.0005	.0005	.0007	.0007	.0008	.0008	.0008	.0008	.0009	.0009	.0008	.0008	
			RPM	4120	4120	4560	3930	3930	3020	3020	2420	2420	2000	2000	1540	1540	1200	1200	
			IPM(FEED)	4	4	8	8	8	8	8	8	8	6	6	5	5	4	4	
			Ae	.0007	.0007	.0035	.0030	.0030	.0040	.0040	.0071	.0050	.0085	.0059	.0113	.0080	.0142	.0142	



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME35 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.2	1.5	2
P	1-8	Non-alloy steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225	230	240
					IPT(fz)	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003
					RPM	42000	42000	39000	39000	36000	32000	28000	25000	23500	21500	18000	15000	11560
					IPM(FEED)	3	3	4	4	4	5	6	6	7	7	7	7	8
	9	Low alloy steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135	140	155
					IPT(fz)	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003
					RPM	25200	25200	23400	23400	21600	19200	16800	15000	14100	12900	10800	9000	7560
					IPM(FEED)	2	2	2	2	3	3	3	4	4	4	4	4	5
	10	High alloyed steel, and tool steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225	230	240
					IPT(fz)	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003
					RPM	42000	42000	39000	39000	36000	32000	28000	25000	23500	21500	18000	15000	11560
					IPM(FEED)	3	3	4	4	4	5	6	6	7	7	7	7	8
	11.1-11.2		1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135	140	155
					IPT(fz)	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003
					RPM	25200	25200	23400	23400	21600	19200	16800	15000	14100	12900	10800	9000	7560
					IPM(FEED)	2	2	2	2	3	3	3	4	4	4	4	4	5
M	14.1	Stainless steel	1D	0.05D (Up to Ø1 : 0.02D)	SFM(Vc)	20	45	60	80	95	100	100	105	110	110	110	115	130
					IPT(fz)	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003
					RPM	21000	21000	19500	19500	18000	16000	14000	12500	11750	10750	9000	7500	6300
					IPM(FEED)	2	2	2	2	2	3	3	3	3	3	3	4	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	45	85	120	160	185	200	200	205	220	220	225	230	240
					IPT(fz)	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003
					RPM	42000	42000	39000	39000	36000	32000	28000	25000	23500	21500	18000	15000	11560
					IPM(FEED)	3	3	4	4	4	5	6	6	7	7	7	7	8
H	38.1-38.2	Hardened steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	15	35	50	65	75	80	80	80	85	90	90	95	105
					IPT(fz)	.00002	.00002	.00002	.00002	.00003	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	16800	16800	15600	15600	14400	12800	11200	10000	9400	8600	7200	6000	5040
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	1	1	2
	40	Chilled Cast Iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	25	50	70	95	110	120	120	125	130	135	135	140	155
					IPT(fz)	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003
					RPM	25200	25200	23400	23400	21600	19200	16800	15000	14100	12900	10800	9000	7560
					IPM(FEED)	2	2	2	2	3	3	3	4	4	4	4	4	5
	41	Hardened Cast Iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	15	35	50	65	75	80	80	80	85	90	90	95	105
					IPT(fz)	.00002	.00002	.00002	.00002	.00003	.00004	.00005	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	16800	16800	15600	15600	14400	12800	11200	10000	9400	8600	7200	6000	5040
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	1	1	2

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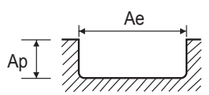

4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
SEME35 SERIES — 2 FLUTE SQUARE - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø) 2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9
P	1-8	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	265	275	295	310	320	325	335	345	350	350	350	345	345	345
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0010	.0012	.0013	.0014	.0016	.0017	.0019	.0019	.0020
				RPM	10240	8920	8240	7560	6930	6300	5930	5560	5220	4880	4540	4200	3965	3730
				IPM(FEED)	8	9	11	12	13	13	14	15	15	15	15	16	15	15
	9	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	170	170	185	190	195	195	200	210	210	210	210	210	210	210
				IPT(fz)	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0014	.0014	.0015	.0016	.0016	.0017	.0017
				RPM	6560	5560	5090	4620	4200	3780	3570	3360	3150	2940	2730	2520	2390	2260
				IPM(FEED)	5	6	7	8	8	8	9	9	9	9	9	8	8	8
	10	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	265	275	295	310	320	325	335	345	350	350	350	345	345	345
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0010	.0012	.0013	.0014	.0016	.0017	.0019	.0019	.0020
				RPM	10240	8920	8240	7560	6930	6300	5930	5560	5220	4880	4540	4200	3965	3730
				IPM(FEED)	8	9	11	12	13	13	14	15	15	15	15	16	15	15
	11.1-11.2	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	170	170	185	190	195	195	200	210	210	210	210	210	210	210
				IPT(fz)	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0014	.0014	.0015	.0016	.0016	.0017	.0017
				RPM	6560	5560	5090	4620	4200	3780	3570	3360	3150	2940	2730	2520	2390	2260
				IPM(FEED)	5	6	7	8	8	8	9	9	9	9	9	8	8	8
M	14.1	1D	0.05D (Up to Ø1 : 0.02D)	SFM(Vc)	140	145	155	160	165	165	170	175	180	180	175	175	175	175
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0011	.0012	.0013	.0014	.0015	.0016	.0018	.0018	.0019
				RPM	5460	4620	4250	3880	3520	3160	3000	2840	2655	2470	2285	2100	1995	1890
				IPM(FEED)	4	5	6	6	7	7	7	8	8	8	8	8	7	7
K	15-20	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	265	275	295	310	320	325	335	345	350	350	350	345	345	345
				IPT(fz)	.0004	.0005	.0006	.0008	.0009	.0010	.0012	.0013	.0014	.0016	.0017	.0019	.0019	.0020
				RPM	10240	8920	8240	7560	6930	6300	5930	5560	5220	4880	4540	4200	3965	3730
				IPM(FEED)	8	9	11	12	13	13	14	15	15	15	15	16	15	15
H	38.1-38.2	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	110	105	115	120	120	120	120	125	130	135	135	140	140	140
				IPT(fz)	.0002	.0003	.0003	.0003	.0004	.0005	.0005	.0006	.0007	.0007	.0008	.0009	.0009	.0009
				RPM	4200	3360	3150	2940	2630	2320	2160	2000	1920	1840	1760	1680	1600	1520
				IPM(FEED)	2	2	2	2	2	2	2	2	3	3	3	3	3	3
	40	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	170	170	185	190	195	195	200	210	210	210	210	210	210	210
				IPT(fz)	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0014	.0014	.0015	.0016	.0016	.0017	.0017
				RPM	6560	5560	5090	4620	4200	3780	3570	3360	3150	2940	2730	2520	2390	2260
				IPM(FEED)	5	6	7	8	8	8	9	9	9	9	9	8	8	8
	41	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	110	105	115	120	120	120	120	125	130	135	135	140	140	140
				IPT(fz)	.0002	.0003	.0003	.0003	.0004	.0005	.0005	.0006	.0007	.0007	.0008	.0009	.0009	.0009
				RPM	4200	3360	3150	2940	2630	2320	2160	2000	1920	1840	1760	1680	1600	1520
				IPM(FEED)	2	2	2	2	2	2	2	2	3	3	3	3	3	3

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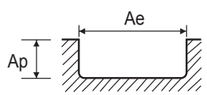

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME35 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 9.5	10	10.5	11	11.5	12	13	14	15	16
P	1-8	Non-alloy steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	340	335	340	340	340	340	350	355	360	365
					IPT(fz)	.0020	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021
					RPM	3495	3260	3130	3000	2870	2740	2605	2470	2335	2200
					IPM(FEED)	14	14	13	13	12	12	11	10	10	9
	9	Low alloy steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	210	205	210	210	210	210	215	220	225	225
					IPT(fz)	.0017	.0017	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0017
					RPM	2130	2000	1920	1840	1760	1680	1600	1520	1440	1360
					IPM(FEED)	7	7	6	6	6	5	5	5	5	5
	10	High alloyed steel, and tool steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	340	335	340	340	340	340	350	355	360	365
					IPT(fz)	.0020	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021
					RPM	3495	3260	3130	3000	2870	2740	2605	2470	2335	2200
					IPM(FEED)	14	14	13	13	12	12	11	10	10	9
	11.1-11.2		1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	210	205	210	210	210	210	215	220	225	225
					IPT(fz)	.0017	.0017	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0017
					RPM	2130	2000	1920	1840	1760	1680	1600	1520	1440	1360
					IPM(FEED)	7	7	6	6	6	5	5	5	5	5
M	14.1	Stainless steel	1D	0.05D (Up to Ø1 : 0.02D)	SFM(Vc)	175	175	175	170	170	170	170	175	175	175
					IPT(fz)	.0019	.0020	.0020	.0019	.0019	.0019	.0020	.0020	.0021	.0021
					RPM	1785	1680	1600	1520	1440	1360	1285	1210	1135	1060
					IPM(FEED)	7	7	6	6	6	5	5	5	5	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	340	335	340	340	340	340	350	355	360	365
					IPT(fz)	.0020	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021
					RPM	3495	3260	3130	3000	2870	2740	2605	2470	2335	2200
					IPM(FEED)	14	14	13	13	12	12	11	10	10	9
H	38.1-38.2	Hardened steel	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	140	140	140	145	145	145	145	150	150	150
					IPT(fz)	.0009	.0009	.0009	.0009	.0010	.0010	.0010	.0009	.0009	.0009
					RPM	1440	1360	1310	1260	1210	1160	1095	1030	965	900
					IPM(FEED)	3	3	2	2	2	2	2	2	2	2
	40	Chilled Cast Iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	210	205	210	210	210	210	215	220	225	225
					IPT(fz)	.0017	.0017	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0017
					RPM	2130	2000	1920	1840	1760	1680	1600	1520	1440	1360
					IPM(FEED)	7	7	6	6	6	5	5	5	5	5
	41	Hardened Cast Iron	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	140	140	140	145	145	145	145	150	150	150
					IPT(fz)	.0009	.0009	.0009	.0009	.0010	.0010	.0010	.0009	.0009	.0009
					RPM	1440	1360	1310	1260	1210	1160	1095	1030	965	900
					IPM(FEED)	3	3	2	2	2	2	2	2	2	2

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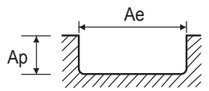
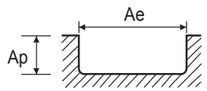


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME35 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø) 17	18	19	20	21	22	23	24	25
P	1-8	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	365	360	355	345	350	350	350	350	350
				IPT(fz)	.0021	.0021	.0021	.0021	.0021	.0021	.0020	.0019	.0019
				RPM	2070	1940	1810	1680	1615	1550	1480	1425	1360
				IPM(FEED)	9	8	8	7	7	7	6	6	5
	9	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	225	225	220	220	220	220	220	220	215
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0017	.0017	.0017
				RPM	1285	1210	1135	1060	1015	970	925	885	840
				IPM(FEED)	4	4	4	3	3	3	3	3	3
	10	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	365	360	355	345	350	350	350	350	350
				IPT(fz)	.0021	.0021	.0021	.0021	.0021	.0021	.0020	.0019	.0019
				RPM	2070	1940	1810	1680	1615	1550	1480	1425	1360
				IPM(FEED)	9	8	8	7	7	7	6	6	5
	11.1-11.2	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	225	225	220	220	220	220	220	220	215
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0017	.0017	.0017
				RPM	1285	1210	1135	1060	1015	970	925	885	840
				IPM(FEED)	4	4	4	3	3	3	3	3	3
M	14.1	1D	0.05D (Up to Ø1 : 0.02D)	SFM(Vc)	175	175	175	175	175	175	175	175	175
				IPT(fz)	.0020	.0021	.0020	.0020	.0019	.0019	.0019	.0018	.0018
				RPM	1005	950	895	840	800	775	745	715	680
				IPM(FEED)	4	4	4	3	3	3	3	3	3
K	15-20	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	365	360	355	345	350	350	350	350	350
				IPT(fz)	.0021	.0021	.0021	.0021	.0021	.0021	.0020	.0019	.0019
				RPM	2070	1940	1810	1680	1615	1550	1480	1425	1360
				IPM(FEED)	9	8	8	7	7	7	6	6	5
H	38.1-38.2	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	150	145	145	140	140	140	140	140	140
				IPT(fz)	.0009	.0009	.0009	.0010	.0008	.0009	.0008	.0008	.0007
				RPM	845	790	735	680	650	620	600	570	540
				IPM(FEED)	2	2	1	1	1	1	1	1	1
	40	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	225	225	220	220	220	220	220	220	215
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0017	.0017	.0017
				RPM	1285	1210	1135	1060	1015	970	925	885	840
				IPM(FEED)	4	4	4	3	3	3	3	3	3
	41	1D	0.5D (Up to Ø3 : 0.2D) (Up to Ø1 : 0.15D)	SFM(Vc)	150	145	145	140	140	140	140	140	140
				IPT(fz)	.0009	.0009	.0009	.0010	.0008	.0009	.0008	.0008	.0007
				RPM	845	790	735	680	650	620	600	570	540
				IPM(FEED)	2	2	1	1	1	1	1	1	1



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.5
					LOC	3	4	5	6	7	8	10	12	4	6	8	10	12	6
P	1-8	Non-alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	165	165	165	150	150	150	150	130	165	165	150	150	150	175
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	16000	16000	16000	14400	14400	14400	14400	12800	13500	13500	12150	12150	12150	11200
					IPM(FEED)	3	3	3	2	2	2	2	2	3	3	2	2	2	3
	9	Low alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	130	130	130	120	120	120	120	105	135	135	120	120	120	140
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002
					RPM	12800	12800	12800	11520	11520	11520	11520	10240	10800	10800	9720	9720	9720	8960
					IPM(FEED)	2	2	2	2	2	2	2	1	3	3	2	2	2	3
	10	High alloyed steel, and tool steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	165	165	165	150	150	150	150	130	165	165	150	150	150	175
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	16000	16000	16000	14400	14400	14400	14400	12800	13500	13500	12150	12150	12150	11200
					IPM(FEED)	3	3	3	2	2	2	2	2	3	3	2	2	2	3
	11.1-11.2		1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	130	130	130	120	120	120	120	105	135	135	120	120	120	140
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002
					RPM	12800	12800	12800	11520	11520	11520	11520	10240	10800	10800	9720	9720	9720	8960
					IPM(FEED)	2	2	2	2	2	2	2	1	3	3	2	2	2	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	165	165	165	150	150	150	150	130	165	165	150	150	150	175
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	16000	16000	16000	14400	14400	14400	14400	12800	13500	13500	12150	12150	12150	11200
					IPM(FEED)	3	3	3	2	2	2	2	2	3	3	2	2	2	3
H	38.1-38.2	Hardened steel	1D	0.05D	SFM(Vc)	80	80	80	75	75	75	75	65	85	85	75	75	75	85
					IPT(fz)	.0006	.0006	.0005	.0007	.0007	.0006	.0006	.0008	.0008	.0006	.0007	.0007	.0006	.0004
					RPM	8000	8000	8000	7200	7200	7200	7200	6400	6750	6750	6080	6080	6080	5600
					IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5
	40	Chilled Cast Iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	130	130	130	120	120	120	120	105	135	135	120	120	120	140
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002
					RPM	12800	12800	12800	11520	11520	11520	11520	10240	10800	10800	9720	9720	9720	8960
					IPM(FEED)	2	2	2	2	2	2	2	1	3	3	2	2	2	3
	41	Hardened Cast Iron	1D	0.05D	SFM(Vc)	80	80	80	75	75	75	75	65	85	85	75	75	75	85
					IPT(fz)	.0006	.0006	.0005	.0007	.0007	.0006	.0006	.0008	.0008	.0006	.0007	.0007	.0006	.0004
					RPM	8000	8000	8000	7200	7200	7200	7200	6400	6750	6750	6080	6080	6080	5600
					IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5

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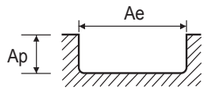

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)														
					1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2.5	2.5	2.5	2.5	3
				LOC	8	10	12	14	16	8	10	12	14	16	10	12	16	20	26	10
P	1-8	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	155	155	155	155	140	185	185	170	170	170	200	200	180	180	160	195
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0003
				RPM	10080	10080	10080	10080	8960	9070	9070	8160	8160	8160	7700	7700	6930	6930	6160	6350
				IPM(FEED)	3	3	2	2	2	3	3	3	3	2	4	4	3	3	2	4
	9	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	125	125	125	125	110	150	150	135	135	135	160	160	145	145	130	160
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0002	.0002	.0002	.0003
				RPM	8060	8060	8060	8060	7170	7260	7260	6530	6530	6530	6200	6200	5580	5580	4960	5150
				IPM(FEED)	2	2	2	2	2	3	3	2	2	2	3	3	3	2	2	3
	10	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	155	155	155	155	140	185	185	170	170	170	200	200	180	180	160	195
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0003
				RPM	10080	10080	10080	10080	8960	9070	9070	8160	8160	8160	7700	7700	6930	6930	6160	6350
				IPM(FEED)	3	3	2	2	2	3	3	3	3	2	4	4	3	3	2	4
	11.1-11.2	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	125	125	125	125	110	150	150	135	135	135	160	160	145	145	130	160
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0002	.0002	.0002	.0003
				RPM	8060	8060	8060	8060	7170	7260	7260	6530	6530	6530	6200	6200	5580	5580	4960	5150
				IPM(FEED)	2	2	2	2	2	3	3	2	2	2	3	3	3	2	2	3
K	15-20	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	155	155	155	155	140	185	185	170	170	170	200	200	180	180	160	195
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0003
				RPM	10080	10080	10080	10080	8960	9070	9070	8160	8160	8160	7700	7700	6930	6930	6160	6350
				IPM(FEED)	3	3	2	2	2	3	3	3	3	2	4	4	3	3	2	4
H	38.1-38.2	1D	0.05D	SFM(Vc)	80	80	80	80	70	95	95	85	85	85	100	100	90	90	80	100
				IPT(fz)	.0015	.0015	.0015	.0012	.0014	.0013	.0011	.0012	.0008	.0003	.0022	.0022	.0024	.0024	.0022	.0021
				RPM	5040	5040	5040	5040	4480	4540	4540	4090	4090	4090	3850	3850	3470	3470	3080	3170
				IPM(FEED)	15	15	15	12	12	12	10	10	6	3	17	17	17	17	14	14
	40	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	125	125	125	125	110	150	150	135	135	135	160	160	145	145	130	160
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003	.0003	.0002	.0002	.0002	.0003
				RPM	8060	8060	8060	8060	7170	7260	7260	6530	6530	6530	6200	6200	5580	5580	4960	5150
				IPM(FEED)	2	2	2	2	2	3	3	2	2	2	3	3	3	2	2	3
	41	1D	0.05D	SFM(Vc)	80	80	80	80	70	95	95	85	85	85	100	100	90	90	80	100
				IPT(fz)	.0015	.0015	.0015	.0012	.0014	.0013	.0011	.0012	.0008	.0003	.0022	.0022	.0024	.0024	.0022	.0021
				RPM	5040	5040	5040	5040	4480	4540	4540	4090	4090	4090	3850	3850	3470	3470	3080	3170
				IPM(FEED)	15	15	15	12	12	12	10	10	6	3	17	17	17	17	14	14

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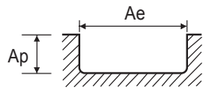

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						3	3	3	3	3	3	4	4	4	4	4	5	5	5
					LOC	12	14	16	20	26	30	12	16	20	26	30	20	25	30
P	1-8	Non-alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	175	175	210	210	210	190	190	225	225	205
					IPT(fz)	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006
					RPM	6350	6350	5720	5720	5720	5720	5150	5150	5150	4640	4640	4400	4400	3960
					IPM(FEED)	4	4	4	3	3	3	5	5	5	4	4	6	6	5
	9	Low alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	160	160	145	145	145	145	170	170	170	150	150	180	180	160
					IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006
					RPM	5150	5150	4640	4640	4640	4640	4100	4100	4100	3690	3690	3480	3480	3130
					IPM(FEED)	3	3	3	3	2	2	4	4	4	3	3	5	5	4
	10	High alloyed steel, and tool steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	175	175	210	210	210	190	190	225	225	205
					IPT(fz)	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006
					RPM	6350	6350	5720	5720	5720	5720	5150	5150	5150	4640	4640	4400	4400	3960
					IPM(FEED)	4	4	4	3	3	3	5	5	5	4	4	6	6	5
	11.1-11.2		1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	160	160	145	145	145	145	170	170	170	150	150	180	180	160
					IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006
					RPM	5150	5150	4640	4640	4640	4640	4100	4100	4100	3690	3690	3480	3480	3130
					IPM(FEED)	3	3	3	3	2	2	4	4	4	3	3	5	5	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	175	175	210	210	210	190	190	225	225	205
					IPT(fz)	.0003	.0003	.0003	.0003	.0002	.0002	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006
					RPM	6350	6350	5720	5720	5720	5720	5150	5150	5150	4640	4640	4400	4400	3960
					IPM(FEED)	4	4	4	3	3	3	5	5	5	4	4	6	6	5
H	38.1-38.2	Hardened steel	1D	0.05D	SFM(Vc)	100	100	90	90	90	90	105	105	105	95	95	115	115	105
					IPT(fz)	.0021	.0017	.0012	.0012	.0005	.0005	.0002	.0042	.0042	.0037	.0037	.0038	.0030	.0022
					RPM	3170	3170	2850	2850	2850	2850	2580	2580	2580	2320	2320	2280	2280	2050
					IPM(FEED)	14	11	7	7	3	3	1	22	22	17	17	17	14	9
	40	Chilled Cast Iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	160	160	145	145	145	145	170	170	170	150	150	180	180	160
					IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006
					RPM	5150	5150	4640	4640	4640	4640	4100	4100	4100	3690	3690	3480	3480	3130
					IPM(FEED)	3	3	3	3	2	2	4	4	4	3	3	5	5	4
	41	Hardened Cast Iron	1D	0.05D	SFM(Vc)	100	100	90	90	90	90	105	105	105	95	95	115	115	105
					IPT(fz)	.0021	.0017	.0012	.0012	.0005	.0005	.0002	.0042	.0042	.0037	.0037	.0038	.0030	.0022
					RPM	3170	3170	2850	2850	2850	2850	2580	2580	2580	2320	2320	2280	2280	2050
					IPM(FEED)	14	11	7	7	3	3	1	22	22	17	17	17	14	9

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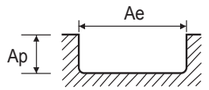

4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
SEME70 SERIES — 2 FLUTE SQUARE - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)														
					5	5	6	6	6	6	6	6	6	8	8	8	8	8	8	10
				LOC	35	40	15	20	25	30	35	40	45	25	30	35	40	45	50	30
P	1-8	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	205	205	235	235	235	235	210	210	210	235	235	235	235	215	215	255
				IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0015
				RPM	3960	3960	3800	3800	3800	3800	3420	3420	3420	2880	2880	2880	2880	2590	2590	2450
				IPM(FEED)	5	4	7	7	7	6	6	5	5	8	8	8	6	6	5	8
	9	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	160	160	190	190	190	190	170	170	170	190	190	190	190	170	170	205
				IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0015
				RPM	3130	3130	3050	3050	3050	3050	2750	2750	2750	2280	2280	2280	2280	2050	2050	2000
				IPM(FEED)	4	4	6	6	6	5	5	4	4	6	6	6	5	5	4	6
	10	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	205	205	235	235	235	235	210	210	210	235	235	235	235	215	215	255
				IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0015
				RPM	3960	3960	3800	3800	3800	3800	3420	3420	3420	2880	2880	2880	2880	2590	2590	2450
				IPM(FEED)	5	4	7	7	7	6	6	5	5	8	8	8	6	6	5	8
	11.1-11.2	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	160	160	190	190	190	190	170	170	170	190	190	190	190	170	170	205
				IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0015
				RPM	3130	3130	3050	3050	3050	3050	2750	2750	2750	2280	2280	2280	2280	2050	2050	2000
				IPM(FEED)	4	4	6	6	6	5	5	4	4	6	6	6	5	5	4	6
K	15-20	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	205	205	235	235	235	235	210	210	210	235	235	235	235	215	215	255
				IPT(fz)	.0006	.0005	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0015
				RPM	3960	3960	3800	3800	3800	3800	3420	3420	3420	2880	2880	2880	2880	2590	2590	2450
				IPM(FEED)	5	4	7	7	7	6	6	5	5	8	8	8	6	6	5	8
H	38.1-38.2	1D	0.05D	SFM(Vc)	105	105	120	120	120	120	110	110	110	125	125	125	125	110	110	125
				IPT(fz)	.0022	.0010	.0010	.0055	.0044	.0044	.0039	.0039	.0026	.0079	.0079	.0079	.0064	.0071	.0071	.0063
				RPM	2050	2050	1970	1970	1970	1970	1770	1770	1770	1510	1510	1510	1510	1360	1360	1210
				IPM(FEED)	9	4	4	22	17	17	14	14	9	24	24	24	19	19	19	15
	40	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	160	160	190	190	190	190	170	170	170	190	190	190	190	170	170	205
				IPT(fz)	.0006	.0006	.0010	.0010	.0010	.0008	.0008	.0007	.0007	.0013	.0013	.0013	.0011	.0011	.0010	.0015
				RPM	3130	3130	3050	3050	3050	3050	2750	2750	2750	2280	2280	2280	2280	2050	2050	2000
				IPM(FEED)	4	4	6	6	6	5	5	4	4	6	6	6	5	5	4	6
	41	1D	0.05D	SFM(Vc)	105	105	120	120	120	120	110	110	110	125	125	125	125	110	110	125
				IPT(fz)	.0022	.0010	.0010	.0055	.0044	.0044	.0039	.0039	.0026	.0079	.0079	.0079	.0064	.0071	.0071	.0063
				RPM	2050	2050	1970	1970	1970	1970	1770	1770	1770	1510	1510	1510	1510	1360	1360	1210
				IPM(FEED)	9	4	4	22	17	17	14	14	9	24	24	24	19	19	19	15

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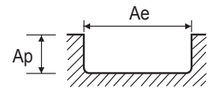

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						10	10	10	10	10	10	12	12	12	12	12	12	12	12
					LOC	35	40	45	50	55	60	35	40	45	50	55	60	65	70
P	1-8	Non-alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	255	255	255	255	230	230	245	245	245	245	245	245	225	225
					IPT(fz)	.0015	.0015	.0013	.0013	.0013	.0012	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011
					RPM	2450	2450	2450	2450	2210	2210	2000	2000	2000	2000	2000	2000	1800	1800
					IPM(FEED)	8	8	6	6	6	5	6	6	5	5	5	4	4	4
	9	Low alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	205	205	205	205	185	185	205	205	205	205	205	205	185	185
					IPT(fz)	.0015	.0015	.0012	.0012	.0013	.0011	.0016	.0016	.0013	.0013	.0013	.0012	.0012	.0012
					RPM	2000	2000	2000	2000	1800	1800	1670	1670	1670	1670	1670	1670	1500	1500
					IPM(FEED)	6	6	5	5	5	4	5	5	5	5	5	4	4	4
	10	High alloyed steel, and tool steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	255	255	255	255	230	230	245	245	245	245	245	245	225	225
					IPT(fz)	.0015	.0015	.0013	.0013	.0013	.0012	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011
					RPM	2450	2450	2450	2450	2210	2210	2000	2000	2000	2000	2000	2000	1800	1800
					IPM(FEED)	8	8	6	6	6	5	6	6	5	5	5	4	4	4
	11.1-11.2		1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	205	205	205	205	185	185	205	205	205	205	205	205	185	185
					IPT(fz)	.0015	.0015	.0012	.0012	.0013	.0011	.0016	.0016	.0013	.0013	.0013	.0012	.0012	.0012
					RPM	2000	2000	2000	2000	1800	1800	1670	1670	1670	1670	1670	1670	1500	1500
					IPM(FEED)	6	6	5	5	5	4	5	5	5	5	5	4	4	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	255	255	255	255	230	230	245	245	245	245	245	245	225	225
					IPT(fz)	.0015	.0015	.0013	.0013	.0013	.0012	.0015	.0015	.0013	.0013	.0013	.0011	.0011	.0011
					RPM	2450	2450	2450	2450	2210	2210	2000	2000	2000	2000	2000	2000	1800	1800
					IPM(FEED)	8	8	6	6	6	5	6	6	5	5	5	4	4	4
H	38.1-38.2	Hardened steel	1D	0.05D	SFM(Vc)	125	125	125	125	110	110	125	125	125	125	125	125	115	115
					IPT(fz)	.0063	.0041	.0041	.0018	.0079	.0079	.0068	.0173	.0173	.0173	.0173	.0140	.0155	.0155
					RPM	1210	1210	1210	1210	1090	1090	1010	1010	1010	1010	1010	1010	910	910
					IPM(FEED)	15	10	10	4	17	17	14	35	35	35	35	28	28	28
	40	Chilled Cast Iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	205	205	205	205	185	185	205	205	205	205	205	205	185	185
					IPT(fz)	.0015	.0015	.0012	.0012	.0013	.0011	.0016	.0016	.0013	.0013	.0013	.0012	.0012	.0012
					RPM	2000	2000	2000	2000	1800	1800	1670	1670	1670	1670	1670	1670	1500	1500
					IPM(FEED)	6	6	5	5	5	4	5	5	5	5	5	4	4	4
	41	Hardened Cast Iron	1D	0.05D	SFM(Vc)	125	125	125	125	110	110	125	125	125	125	125	125	115	115
					IPT(fz)	.0063	.0041	.0041	.0018	.0079	.0079	.0068	.0173	.0173	.0173	.0173	.0140	.0155	.0155
					RPM	1210	1210	1210	1210	1090	1090	1010	1010	1010	1010	1010	1010	910	910
					IPM(FEED)	15	10	10	4	17	17	14	35	35	35	35	28	28	28

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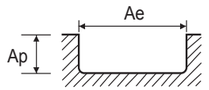

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)														
					14	14	16	16	16	16	16	16	16	16	18	18	18	20	20	20
				LOC	50	60	40	50	60	70	80	90	110	120	50	70	100	50	60	70
P	1-8	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	265	265	280	280	280	280	280	250	250	250	270	270	245	250	250	250
				IPT(fz)	.0013	.0013	.0016	.0016	.0014	.0014	.0012	.0012	.0012	.0012	.0016	.0013	.0012	.0016	.0016	.0014
				RPM	1850	1850	1700	1700	1700	1700	1700	1530	1530	1530	1450	1450	1310	1220	1220	1220
				IPM(FEED)	5	5	6	6	5	5	4	4	4	4	5	4	3	4	4	3
	9	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	215	215	210	210	210	210	210	190	190	190	210	210	185	195	195	195
				IPT(fz)	.0013	.0013	.0016	.0016	.0014	.0014	.0012	.0012	.0012	.0012	.0016	.0013	.0012	.0016	.0016	.0014
				RPM	1480	1480	1280	1280	1280	1280	1280	1150	1150	1150	1120	1120	1000	950	950	950
				IPM(FEED)	4	4	4	4	4	4	3	3	3	3	4	3	2	3	3	3
	10	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	265	265	280	280	280	280	280	250	250	250	270	270	245	250	250	250
				IPT(fz)	.0013	.0013	.0016	.0016	.0014	.0014	.0012	.0012	.0012	.0012	.0016	.0013	.0012	.0016	.0016	.0014
				RPM	1850	1850	1700	1700	1700	1700	1700	1530	1530	1530	1450	1450	1310	1220	1220	1220
				IPM(FEED)	5	5	6	6	5	5	4	4	4	4	5	4	3	4	4	3
	11.1-11.2	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	215	215	210	210	210	210	210	190	190	190	210	210	185	195	195	195
				IPT(fz)	.0013	.0013	.0016	.0016	.0014	.0014	.0012	.0012	.0012	.0012	.0016	.0013	.0012	.0016	.0016	.0014
				RPM	1480	1480	1280	1280	1280	1280	1280	1150	1150	1150	1120	1120	1000	950	950	950
				IPM(FEED)	4	4	4	4	4	4	3	3	3	3	4	3	2	3	3	3
K	15-20	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	265	265	280	280	280	280	280	250	250	250	270	270	245	250	250	250
				IPT(fz)	.0013	.0013	.0016	.0016	.0014	.0014	.0012	.0012	.0012	.0012	.0016	.0013	.0012	.0016	.0016	.0014
				RPM	1850	1850	1700	1700	1700	1700	1700	1530	1530	1530	1450	1450	1310	1220	1220	1220
				IPM(FEED)	5	5	6	6	5	5	4	4	4	4	5	4	3	4	4	3
H	38.1-38.2	1D	0.05D	SFM(Vc)	130	130	130	130	130	130	130	120	120	120	130	130	115	125	125	125
				IPT(fz)	.0155	.0123	.0140	.0093	.0093	.0093	.0039	.0044	.0044	.0013	.0013	.0202	.0225	.0192	.0192	.0192
				RPM	910	910	800	800	800	800	800	720	720	720	700	700	630	600	600	600
				IPM(FEED)	28	22	22	15	15	15	6	6	6	2	2	28	28	23	23	23
	40	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	215	215	210	210	210	210	210	190	190	190	210	210	185	195	195	195
				IPT(fz)	.0013	.0013	.0016	.0016	.0014	.0014	.0012	.0012	.0012	.0012	.0016	.0013	.0012	.0016	.0016	.0014
				RPM	1480	1480	1280	1280	1280	1280	1280	1150	1150	1150	1120	1120	1000	950	950	950
				IPM(FEED)	4	4	4	4	4	4	3	3	3	3	4	3	2	3	3	3
	41	1D	0.05D	SFM(Vc)	130	130	130	130	130	130	130	120	120	120	130	130	115	125	125	125
				IPT(fz)	.0155	.0123	.0140	.0093	.0093	.0093	.0039	.0044	.0044	.0013	.0013	.0202	.0225	.0192	.0192	.0192
				RPM	910	910	800	800	800	800	800	720	720	720	700	700	630	600	600	600
				IPM(FEED)	28	22	22	15	15	15	6	6	6	2	2	28	28	23	23	23

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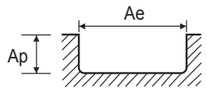


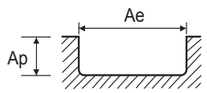
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME70 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)									
						20	20	20	20	22	22	25	25	25	25
					LOC	80	90	110	120	75	110	70	90	110	120
P	1-8	Non-alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	250	250	225	225	250	250	255	255	255	255
					IPT(fz)	.0014	.0012	.0013	.0013	.0014	.0013	.0016	.0014	.0014	.0012
					RPM	1220	1220	1100	1100	1100	1100	980	980	980	980
					IPM(FEED)	3	3	3	3	3	3	3	3	3	2
	9	Low alloy steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	190	190	195	195	195	195
					IPT(fz)	.0014	.0012	.0012	.0012	.0013	.0012	.0016	.0013	.0013	.0012
					RPM	950	950	860	860	840	840	750	750	750	750
					IPM(FEED)	3	2	2	2	2	2	2	2	2	2
	10	High alloyed steel, and tool steel	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	250	250	225	225	250	250	255	255	255	255
					IPT(fz)	.0014	.0012	.0013	.0013	.0014	.0013	.0016	.0014	.0014	.0012
					RPM	1220	1220	1100	1100	1100	1100	980	980	980	980
					IPM(FEED)	3	3	3	3	3	3	3	3	3	2
	11.1-11.2		1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	190	190	195	195	195	195
					IPT(fz)	.0014	.0012	.0012	.0012	.0013	.0012	.0016	.0013	.0013	.0012
					RPM	950	950	860	860	840	840	750	750	750	750
					IPM(FEED)	3	2	2	2	2	2	2	2	2	2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	250	250	225	225	250	250	255	255	255	255
					IPT(fz)	.0014	.0012	.0013	.0013	.0014	.0013	.0016	.0014	.0014	.0012
					RPM	1220	1220	1100	1100	1100	1100	980	980	980	980
					IPM(FEED)	3	3	3	3	3	3	3	3	3	2
H	38.1-38.2	Hardened steel	1D	0.05D	SFM(Vc)	125	125	110	110	125	125	125	125	125	125
					IPT(fz)	.0151	.0151	.0109	.0047	.0046	.0204	.0189	.0189	.0189	.0150
					RPM	600	600	540	540	550	550	480	480	480	480
					IPM(FEED)	18	18	12	5	5	22	18	18	18	14
	40	Chilled Cast Iron	1D	0.3D (Up to Ø3 : 0.4mm)	SFM(Vc)	195	195	175	175	190	190	195	195	195	195
					IPT(fz)	.0014	.0012	.0012	.0012	.0013	.0012	.0016	.0013	.0013	.0012
					RPM	950	950	860	860	840	840	750	750	750	750
					IPM(FEED)	3	2	2	2	2	2	2	2	2	2
	41	Hardened Cast Iron	1D	0.05D	SFM(Vc)	125	125	110	110	125	125	125	125	125	125
					IPT(fz)	.0151	.0151	.0109	.0047	.0046	.0204	.0189	.0189	.0189	.0150
					RPM	600	600	540	540	550	550	480	480	480	480
					IPM(FEED)	18	18	12	5	5	22	18	18	18	14



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																	
				0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
			LBS	0.3	0.5	1	0.5	1	1.5	2	1	1.5	2	2.5	3	4	5	1	1.5	2
P	1-8	Non-alloy steel	SFM(Vc)	50	50	45	80	80	70	70	105	105	95	95	95	85	65	115	115	115
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004
			RPM	50000	50000	45000	38500	38500	34650	34650	34200	34200	30780	30780	30780	27360	20520	27400	27400	27400
			IPM(FEED)	12	12	10	15	15	12	12	15	15	12	12	12	10	7	21	21	21
			Ap	.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014	.0010	.0010
	9	Low alloy steel	SFM(Vc)	50	50	45	75	75	65	65	100	100	90	90	90	80	60	105	105	105
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003
			RPM	46200	46200	41580	36300	36300	32670	32670	32300	32300	29070	29070	29070	25840	19380	25800	25800	25800
			IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5	15	15	15
			Ap	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0006	.0006	.0003	.0002	.0002	.0001	.0001	.0011	.0008	.0008
	10	High alloyed steel, and tool steel	SFM(Vc)	50	50	45	80	80	70	70	105	105	95	95	95	85	65	115	115	115
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004
			RPM	50000	50000	45000	38500	38500	34650	34650	34200	34200	30780	30780	30780	27360	20520	27400	27400	27400
			IPM(FEED)	12	12	10	15	15	12	12	15	15	12	12	12	10	7	21	21	21
			Ap	.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014	.0010	.0010
	11.1-11.2		SFM(Vc)	50	50	45	75	75	65	65	100	100	90	90	90	80	60	105	105	105
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003
			RPM	46200	46200	41580	36300	36300	32670	32670	32300	32300	29070	29070	29070	25840	19380	25800	25800	25800
			IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5	15	15	15
			Ap	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0006	.0006	.0003	.0002	.0002	.0001	.0001	.0011	.0008	.0008
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	50	50	45	80	80	70	70	105	105	95	95	95	85	65	115	115	115
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004
			RPM	50000	50000	45000	38500	38500	34650	34650	34200	34200	30780	30780	30780	27360	20520	27400	27400	27400
			IPM(FEED)	12	12	10	15	15	12	12	15	15	12	12	12	10	7	21	21	21
			Ap	.0004	.0002	.0001	.0007	.0005	.0003	.0002	.0007	.0007	.0004	.0003	.0003	.0002	.0001	.0014	.0010	.0010
H	38.1-38.2	Hardened steel	SFM(Vc)	40	40	40	65	65	60	60	90	90	80	80	80	70	55	95	95	95
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	40600	40600	36540	32100	32100	28890	28890	28500	28500	25650	25650	25650	22800	17100	22800	22800	22800
			IPM(FEED)	7	7	6	8	8	6	6	9	9	7	7	7	6	4	11	11	11
			Ap	.0002	.0002	.0000	.0004	.0003	.0002	.0001	.0004	.0004	.0002	.0002	.0002	.0001	.0001	.0008	.0006	.0006
	40	Chilled Cast Iron	SFM(Vc)	50	50	45	75	75	65	65	100	100	90	90	90	80	60	105	105	105
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0003	.0003	.0003
			RPM	46200	46200	41580	36300	36300	32670	32670	32300	32300	29070	29070	29070	25840	19380	25800	25800	25800
			IPM(FEED)	9	9	7	11	11	9	9	11	11	9	9	9	7	5	15	15	15
			Ap	.0003	.0002	.0001	.0006	.0004	.0002	.0002	.0006	.0006	.0003	.0002	.0002	.0001	.0001	.0011	.0008	.0008
	41	Hardened Cast Iron	SFM(Vc)	40	40	40	65	65	60	60	90	90	80	80	80	70	55	95	95	95
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
			RPM	40600	40600	36540	32100	32100	28890	28890	28500	28500	25650	25650	25650	22800	17100	22800	22800	22800
			IPM(FEED)	7	7	6	8	8	6	6	9	9	7	7	7	6	4	11	11	11
			Ap	.0002	.0002	.0000	.0004	.0003	.0002	.0001	.0004	.0004	.0002	.0002	.0002	.0001	.0001	.0008	.0006	.0006

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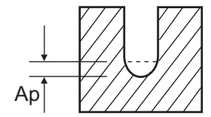
(Depth of Cut per one pass)



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
				LBS	2.5	3	4	5	6	8	10	1	1.5	2	2.5	3	4	5	6	8	10
P	1-8	Non-alloy steel	SFM(Vc)	100	100	100	90	90	70	35	140	140	140	140	125	125	125	115	85	85
			IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	24660	24660	24660	21920	21920	16440	8220	27400	27400	27400	27400	24660	24660	24660	21920	16440	16440
			IPM(FEED)	17	17	17	14	14	9	4	21	21	21	21	17	17	17	14	9	9
			Ap	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0018	.0018	.0013	.0013	.0007	.0007	.0004	.0004	.0003	.0002
	9	Low alloy steel	SFM(Vc)	95	95	95	85	85	65	30	135	135	135	135	120	120	120	105	80	80
			IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	23220	23220	23220	20640	20640	15480	7740	25800	25800	25800	25800	23220	23220	23220	20640	15480	15480
			IPM(FEED)	12	12	12	10	10	6	3	17	17	17	17	14	14	14	11	7	7
			Ap	.0004	.0004	.0003	.0003	.0002	.0001	.0001	.0014	.0014	.0010	.0010	.0006	.0006	.0004	.0004	.0002	.0002
	10	High alloyed steel, and tool steel	SFM(Vc)	100	100	100	90	90	70	35	140	140	140	140	125	125	125	115	85	85
			IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	24660	24660	24660	21920	21920	16440	8220	27400	27400	27400	27400	24660	24660	24660	21920	16440	16440
			IPM(FEED)	17	17	17	14	14	9	4	21	21	21	21	17	17	17	14	9	9
			Ap	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0018	.0018	.0013	.0013	.0007	.0007	.0004	.0004	.0003	.0002
	11.1-11.2		SFM(Vc)	95	95	95	85	85	65	30	135	135	135	135	120	120	120	105	80	80
			IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	23220	23220	23220	20640	20640	15480	7740	25800	25800	25800	25800	23220	23220	23220	20640	15480	15480
			IPM(FEED)	12	12	12	10	10	6	3	17	17	17	17	14	14	14	11	7	7
			Ap	.0004	.0004	.0003	.0003	.0002	.0001	.0001	.0014	.0014	.0010	.0010	.0006	.0006	.0004	.0004	.0002	.0002
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	100	100	100	90	90	70	35	140	140	140	140	125	125	125	115	85	85
			IPT(fz)	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	24660	24660	24660	21920	21920	16440	8220	27400	27400	27400	27400	24660	24660	24660	21920	16440	16440
			IPM(FEED)	17	17	17	14	14	9	4	21	21	21	21	17	17	17	14	9	9
			Ap	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0018	.0018	.0013	.0013	.0007	.0007	.0004	.0004	.0003	.0002
H	38.1-38.2	Hardened steel	SFM(Vc)	85	85	85	75	75	55	30	115	115	115	115	105	105	105	95	70	70
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	20520	20520	20520	18240	18240	13680	6840	22800	22800	22800	22800	20520	20520	20520	18240	13680	13680
			IPM(FEED)	9	9	9	7	7	5	2	11	11	11	11	9	9	9	7	5	5
			Ap	.0003	.0003	.0002	.0002	.0001	.0001	.0001	.0010	.0010	.0007	.0007	.0004	.0004	.0002	.0002	.0002	.0001
	40	Chilled Cast Iron	SFM(Vc)	95	95	95	85	85	65	30	135	135	135	135	120	120	120	105	80	80
			IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	23220	23220	23220	20640	20640	15480	7740	25800	25800	25800	25800	23220	23220	23220	20640	15480	15480
			IPM(FEED)	12	12	12	10	10	6	3	17	17	17	17	14	14	14	11	7	7
			Ap	.0004	.0004	.0003	.0003	.0002	.0001	.0001	.0014	.0014	.0010	.0010	.0006	.0006	.0004	.0004	.0002	.0002
	41	Hardened Cast Iron	SFM(Vc)	85	85	85	75	75	55	30	115	115	115	115	105	105	105	95	70	70
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
			RPM	20520	20520	20520	18240	18240	13680	6840	22800	22800	22800	22800	20520	20520	20520	18240	13680	13680
			IPM(FEED)	9	9	9	7	7	5	2	11	11	11	11	9	9	9	7	5	5
			Ap	.0003	.0003	.0002	.0002	.0001	.0001	.0001	.0010	.0010	.0007	.0007	.0004	.0004	.0002	.0002	.0002	.0001

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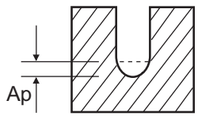
(Depth of Cut per one pass)



4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																						
			0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8
		LBS	12	14	16	2	3	4	5	6	8	10	12	14	16	2	4	6	8	10	12	2
P	1-8	SFM(Vc)	40	40	15	170	170	150	150	150	135	100	100	50	50	200	180	180	160	160	120	225
		IPT(fz)	.0002	.0002	.0002	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0003	.0006	.0005	.0005	.0004	.0004	.0004	.0006
		RPM	8220	8220	2740	27400	27400	24660	24660	24660	21920	16440	16440	8220	8220	27400	24660	24660	21920	21920	16440	27400
		IPM(FEED)	4	4	1	31	31	25	25	25	20	13	13	6	6	31	25	25	20	20	13	31
		Ap	.0002	.0002	.0002	.0015	.0015	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0002	.0025	.0010	.0006	.0006	.0004	.0002	.0028
	9	SFM(Vc)	40	40	15	160	160	145	145	145	130	95	95	50	50	185	170	170	150	150	110	215
		IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0003	.0003	.0003	.0005
		RPM	7740	7740	2580	25800	25800	23220	23220	23220	20640	15480	15480	7740	7740	25800	23220	23220	20640	20640	15480	25800
		IPM(FEED)	3	3	1	22	22	17	17	17	14	9	9	4	4	22	17	17	14	14	9	24
		Ap	.0002	.0002	.0002	.0011	.0011	.0007	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0019	.0008	.0005	.0005	.0003	.0002	.0022
	10	SFM(Vc)	40	40	15	170	170	150	150	150	135	100	100	50	50	200	180	180	160	160	120	225
		IPT(fz)	.0002	.0002	.0002	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0003	.0006	.0005	.0005	.0004	.0004	.0004	.0006
		RPM	8220	8220	2740	27400	27400	24660	24660	24660	21920	16440	16440	8220	8220	27400	24660	24660	21920	21920	16440	27400
		IPM(FEED)	4	4	1	31	31	25	25	25	20	13	13	6	6	31	25	25	20	20	13	31
		Ap	.0002	.0002	.0002	.0015	.0015	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0002	.0025	.0010	.0006	.0006	.0004	.0002	.0028
	11.1-11.2	SFM(Vc)	40	40	15	160	160	145	145	145	130	95	95	50	50	185	170	170	150	150	110	215
		IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0003	.0003	.0003	.0005
		RPM	7740	7740	2580	25800	25800	23220	23220	23220	20640	15480	15480	7740	7740	25800	23220	23220	20640	20640	15480	25800
		IPM(FEED)	3	3	1	22	22	17	17	17	14	9	9	4	4	22	17	17	14	14	9	24
		Ap	.0002	.0002	.0002	.0011	.0011	.0007	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0019	.0008	.0005	.0005	.0003	.0002	.0022
K	15-20	SFM(Vc)	40	40	15	170	170	150	150	150	135	100	100	50	50	200	180	180	160	160	120	225
		IPT(fz)	.0002	.0002	.0002	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0003	.0003	.0006	.0005	.0005	.0004	.0004	.0004	.0006
		RPM	8220	8220	2740	27400	27400	24660	24660	24660	21920	16440	16440	8220	8220	27400	24660	24660	21920	21920	16440	27400
		IPM(FEED)	4	4	1	31	31	25	25	25	20	13	13	6	6	31	25	25	20	20	13	31
		Ap	.0002	.0002	.0002	.0015	.0015	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0002	.0025	.0010	.0006	.0006	.0004	.0002	.0028
H	38.1-38.2	SFM(Vc)	35	35	10	140	140	125	125	125	115	85	85	40	40	165	150	150	130	130	100	190
		IPT(fz)	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0002	.0004
		RPM	6840	6840	2280	22800	22800	20520	20520	20520	18240	13680	13680	6840	6840	22800	20520	20520	18240	18240	13680	22800
		IPM(FEED)	2	2	1	16	16	13	13	13	10	7	7	3	3	16	13	13	10	10	7	18
		Ap	.0001	.0001	.0001	.0008	.0008	.0005	.0003	.0003	.0002	.0001	.0001	.0001	.0001	.0014	.0006	.0004	.0004	.0002	.0002	.0016
	40	SFM(Vc)	40	40	15	160	160	145	145	145	130	95	95	50	50	185	170	170	150	150	110	215
		IPT(fz)	.0002	.0002	.0002	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0003	.0003	.0003	.0005
		RPM	7740	7740	2580	25800	25800	23220	23220	23220	20640	15480	15480	7740	7740	25800	23220	23220	20640	20640	15480	25800
		IPM(FEED)	3	3	1	22	22	17	17	17	14	9	9	4	4	22	17	17	14	14	9	24
		Ap	.0002	.0002	.0002	.0011	.0011	.0007	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0019	.0008	.0005	.0005	.0003	.0002	.0022
	41	SFM(Vc)	35	35	10	140	140	125	125	125	115	85	85	40	40	165	150	150	130	130	100	190
		IPT(fz)	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0002	.0004
		RPM	6840	6840	2280	22800	22800	20520	20520	20520	18240	13680	13680	6840	6840	22800	20520	20520	18240	18240	13680	22800
		IPM(FEED)	2	2	1	16	16	13	13	13	10	7	7	3	3	16	13	13	10	10	7	18
		Ap	.0001	.0001	.0001	.0008	.0008	.0005	.0003	.0003	.0002	.0001	.0001	.0001	.0001	.0014	.0006	.0004	.0004	.0002	.0002	.0016

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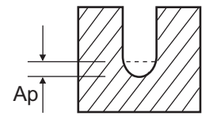
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1	1	1	1
			LBS	3	4	5	6	8	10	12	14	16	20	6	8	10	2	3	4	5
P	1-8	Non-alloy steel	SFM(Vc)	225	225	205	205	205	180	180	135	135	70	205	205	185	255	255	255	255
			IPT(fz)	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0005	.0005	.0005	.0008	.0008	.0008	.0008
			RPM	27400	27400	24660	24660	24660	21920	21920	16440	16440	8220	22140	22140	19680	24600	24600	24600	24600
			IPM(FEED)	31	31	25	25	25	20	20	13	13	6	23	23	18	41	41	41	41
			Ap	.0020	.0020	.0011	.0011	.0007	.0007	.0004	.0003	.0003	.0003	.0013	.0008	.0008	.0035	.0035	.0025	.0025
	9	Low alloy steel	SFM(Vc)	215	215	190	190	190	170	170	130	130	65	195	195	175	240	240	240	240
			IPT(fz)	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0004	.0004	.0004	.0008	.0008	.0008	.0008
			RPM	25800	25800	23220	23220	23220	20640	20640	15480	15480	7740	20970	20970	18640	23300	23300	23300	23300
			IPM(FEED)	24	24	19	19	19	15	15	10	10	4	17	17	14	35	35	35	35
			Ap	.0015	.0015	.0009	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0010	.0006	.0006	.0028	.0028	.0019	.0019
	10	High alloyed steel, and tool steel	SFM(Vc)	225	225	205	205	205	180	180	135	135	70	205	205	185	255	255	255	255
			IPT(fz)	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0005	.0005	.0005	.0008	.0008	.0008	.0008
			RPM	27400	27400	24660	24660	24660	21920	21920	16440	16440	8220	22140	22140	19680	24600	24600	24600	24600
			IPM(FEED)	31	31	25	25	25	20	20	13	13	6	23	23	18	41	41	41	41
			Ap	.0020	.0020	.0011	.0011	.0007	.0007	.0004	.0003	.0003	.0003	.0013	.0008	.0008	.0035	.0035	.0025	.0025
	11.1-11.2		SFM(Vc)	215	215	190	190	190	170	170	130	130	65	195	195	175	240	240	240	240
			IPT(fz)	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0004	.0004	.0004	.0008	.0008	.0008	.0008
			RPM	25800	25800	23220	23220	23220	20640	20640	15480	15480	7740	20970	20970	18640	23300	23300	23300	23300
			IPM(FEED)	24	24	19	19	19	15	15	10	10	4	17	17	14	35	35	35	35
			Ap	.0015	.0015	.0009	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0010	.0006	.0006	.0028	.0028	.0019	.0019
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	225	225	205	205	205	180	180	135	135	70	205	205	185	255	255	255	255
			IPT(fz)	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0003	.0005	.0005	.0005	.0008	.0008	.0008	.0008
			RPM	27400	27400	24660	24660	24660	21920	21920	16440	16440	8220	22140	22140	19680	24600	24600	24600	24600
			IPM(FEED)	31	31	25	25	25	20	20	13	13	6	23	23	18	41	41	41	41
			Ap	.0020	.0020	.0011	.0011	.0007	.0007	.0004	.0003	.0003	.0003	.0013	.0008	.0008	.0035	.0035	.0025	.0025
H	38.1-38.2	Hardened steel	SFM(Vc)	190	190	170	170	170	150	150	115	115	55	170	170	150	210	210	210	210
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0003	.0006	.0006	.0006	.0006
			RPM	22800	22800	20520	20520	20520	18240	18240	13680	13680	6840	18450	18450	16400	20500	20500	20500	20500
			IPM(FEED)	18	18	14	14	14	11	11	8	8	3	13	13	10	26	26	26	26
			Ap	.0011	.0011	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0002	.0007	.0004	.0004	.0020	.0020	.0014	.0014
	40	Chilled Cast Iron	SFM(Vc)	215	215	190	190	190	170	170	130	130	65	195	195	175	240	240	240	240
			IPT(fz)	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0004	.0004	.0004	.0008	.0008	.0008	.0008
			RPM	25800	25800	23220	23220	23220	20640	20640	15480	15480	7740	20970	20970	18640	23300	23300	23300	23300
			IPM(FEED)	24	24	19	19	19	15	15	10	10	4	17	17	14	35	35	35	35
			Ap	.0015	.0015	.0009	.0009	.0006	.0006	.0003	.0002	.0002	.0002	.0010	.0006	.0006	.0028	.0028	.0019	.0019
	41	Hardened Cast Iron	SFM(Vc)	190	190	170	170	170	150	150	115	115	55	170	170	150	210	210	210	210
			IPT(fz)	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0003	.0002	.0004	.0004	.0003	.0006	.0006	.0006	.0006
			RPM	22800	22800	20520	20520	20520	18240	18240	13680	13680	6840	18450	18450	16400	20500	20500	20500	20500
			IPM(FEED)	18	18	14	14	14	11	11	8	8	3	13	13	10	26	26	26	26
			Ap	.0011	.0011	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0002	.0007	.0004	.0004	.0020	.0020	.0014	.0014

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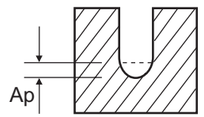
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																					
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.2
		LBS	6	7	8	10	12	14	16	18	20	22	26	30	40	50	4	6	8	10	12	14
P	1-8	SFM(Vc)	230	230	230	230	205	205	150	150	150	75	75	75	25	25	270	270	245	245	245	215
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0008	.0008	.0008	.0008	.0008	.0007
		RPM	22140	22140	22140	22140	19680	19680	14760	14760	14760	7380	7380	7380	2460	2460	21900	21900	19710	19710	19710	17520
		IPM(FEED)	33	33	33	33	26	26	17	17	17	8	8	8	2	2	37	37	30	30	30	23
		Ap	.0014	.0014	.0014	.0009	.0009	.0006	.0006	.0004	.0004	.0004	.0004	.0004	.0004	.0002	.0030	.0030	.0017	.0011	.0011	.0011
	9	SFM(Vc)	215	215	215	215	190	190	145	145	145	70	70	70	25	25	255	255	230	230	230	205
		IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006	.0006	.0006	.0005
		RPM	20970	20970	20970	20970	18640	18640	13980	13980	13980	6990	6990	6990	2330	2330	20700	20700	18630	18630	18630	16560
		IPM(FEED)	28	28	28	28	22	22	15	15	15	6	6	6	2	2	28	28	23	23	23	18
		Ap	.0011	.0011	.0011	.0007	.0007	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0023	.0023	.0013	.0008	.0008	.0008
	10	SFM(Vc)	230	230	230	230	205	205	150	150	150	75	75	75	25	25	270	270	245	245	245	215
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0008	.0008	.0008	.0008	.0008	.0007
		RPM	22140	22140	22140	22140	19680	19680	14760	14760	14760	7380	7380	7380	2460	2460	21900	21900	19710	19710	19710	17520
		IPM(FEED)	33	33	33	33	26	26	17	17	17	8	8	8	2	2	37	37	30	30	30	23
		Ap	.0014	.0014	.0014	.0009	.0009	.0006	.0006	.0004	.0004	.0004	.0004	.0004	.0004	.0002	.0030	.0030	.0017	.0011	.0011	.0011
	11.1-11.2	SFM(Vc)	215	215	215	215	190	190	145	145	145	70	70	70	25	25	255	255	230	230	230	205
		IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006	.0006	.0006	.0005
		RPM	20970	20970	20970	20970	18640	18640	13980	13980	13980	6990	6990	6990	2330	2330	20700	20700	18630	18630	18630	16560
		IPM(FEED)	28	28	28	28	22	22	15	15	15	6	6	6	2	2	28	28	23	23	23	18
		Ap	.0011	.0011	.0011	.0007	.0007	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0023	.0023	.0013	.0008	.0008	.0008
K	15-20	SFM(Vc)	230	230	230	230	205	205	150	150	150	75	75	75	25	25	270	270	245	245	245	215
		IPT(fz)	.0008	.0008	.0008	.0008	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0004	.0004	.0008	.0008	.0008	.0008	.0008	.0007
		RPM	22140	22140	22140	22140	19680	19680	14760	14760	14760	7380	7380	7380	2460	2460	21900	21900	19710	19710	19710	17520
		IPM(FEED)	33	33	33	33	26	26	17	17	17	8	8	8	2	2	37	37	30	30	30	23
		Ap	.0014	.0014	.0014	.0009	.0009	.0006	.0006	.0004	.0004	.0004	.0004	.0004	.0004	.0002	.0030	.0030	.0017	.0011	.0011	.0011
H	38.1-38.2	SFM(Vc)	190	190	190	190	170	170	125	125	125	65	65	65	20	20	225	225	205	205	205	180
		IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0005	.0005	.0004
		RPM	18450	18450	18450	18450	16400	16400	12300	12300	12300	6150	6150	6150	2050	2050	18200	18200	16380	16380	16380	14560
		IPM(FEED)	21	21	21	21	17	17	11	11	11	5	5	5	1	1	19	19	16	16	16	12
		Ap	.0008	.0008	.0008	.0005	.0005	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0017	.0017	.0009	.0006	.0006	.0006
	40	SFM(Vc)	215	215	215	215	190	190	145	145	145	70	70	70	25	25	255	255	230	230	230	205
		IPT(fz)	.0007	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0007	.0006	.0006	.0006	.0005
		RPM	20970	20970	20970	20970	18640	18640	13980	13980	13980	6990	6990	6990	2330	2330	20700	20700	18630	18630	18630	16560
		IPM(FEED)	28	28	28	28	22	22	15	15	15	6	6	6	2	2	28	28	23	23	23	18
		Ap	.0011	.0011	.0011	.0007	.0007	.0004	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0023	.0023	.0013	.0008	.0008	.0008
	41	SFM(Vc)	190	190	190	190	170	170	125	125	125	65	65	65	20	20	225	225	205	205	205	180
		IPT(fz)	.0006	.0006	.0006	.0006	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0005	.0005	.0004
		RPM	18450	18450	18450	18450	16400	16400	12300	12300	12300	6150	6150	6150	2050	2050	18200	18200	16380	16380	16380	14560
		IPM(FEED)	21	21	21	21	17	17	11	11	11	5	5	5	1	1	19	19	16	16	16	12
		Ap	.0008	.0008	.0008	.0005	.0005	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0017	.0017	.0009	.0006	.0006	.0006

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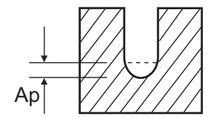
(Depth of Cut per one pass)



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5
			LBS	16	20	26	30	6	8	10	14	16	20	4	5	6	7	8	10	12
P	1-8	Non-alloy steel	SFM(Vc)	215	165	80	80	275	250	250	250	220	220	295	295	295	295	265	265	265
			IPT(fz)	.0007	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0009	.0009	.0008	.0008	.0008
			RPM	17520	13140	6570	6570	19200	17280	17280	17280	15360	15360	19200	19200	19200	19200	17280	17280	17280
			IPM(FEED)	23	15	7	7	32	26	26	26	21	21	36	36	36	36	29	29	29
			Ap	.0006	.0004	.0004	.0004	.0035	.0020	.0020	.0013	.0013	.0007	.0053	.0037	.0037	.0037	.0021	.0021	.0021
	9	Low alloy steel	SFM(Vc)	205	155	75	75	260	235	235	235	210	210	280	280	280	280	250	250	250
			IPT(fz)	.0005	.0005	.0004	.0004	.0006	.0006	.0006	.0006	.0005	.0005	.0007	.0007	.0007	.0007	.0006	.0006	.0006
			RPM	16560	12420	6210	6210	18100	16290	16290	16290	14480	14480	18100	18100	18100	18100	16290	16290	16290
			IPM(FEED)	18	12	5	5	22	18	18	18	14	14	25	25	25	25	20	20	20
			Ap	.0005	.0003	.0003	.0003	.0027	.0015	.0015	.0010	.0010	.0006	.0041	.0029	.0029	.0029	.0017	.0017	.0017
	10	High alloyed steel, and tool steel	SFM(Vc)	215	165	80	80	275	250	250	250	220	220	295	295	295	295	265	265	265
			IPT(fz)	.0007	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0009	.0009	.0008	.0008	.0008
			RPM	17520	13140	6570	6570	19200	17280	17280	17280	15360	15360	19200	19200	19200	19200	17280	17280	17280
			IPM(FEED)	23	15	7	7	32	26	26	26	21	21	36	36	36	36	29	29	29
			Ap	.0006	.0004	.0004	.0004	.0035	.0020	.0020	.0013	.0013	.0007	.0053	.0037	.0037	.0037	.0021	.0021	.0021
	11.1-11.2		SFM(Vc)	205	155	75	75	260	235	235	235	210	210	280	280	280	280	250	250	250
			IPT(fz)	.0005	.0005	.0004	.0004	.0006	.0006	.0006	.0006	.0005	.0005	.0007	.0007	.0007	.0007	.0006	.0006	.0006
			RPM	16560	12420	6210	6210	18100	16290	16290	16290	14480	14480	18100	18100	18100	18100	16290	16290	16290
			IPM(FEED)	18	12	5	5	22	18	18	18	14	14	25	25	25	25	20	20	20
			Ap	.0005	.0003	.0003	.0003	.0027	.0015	.0015	.0010	.0010	.0006	.0041	.0029	.0029	.0029	.0017	.0017	.0017
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	215	165	80	80	275	250	250	250	220	220	295	295	295	295	265	265	265
			IPT(fz)	.0007	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0007	.0009	.0009	.0009	.0009	.0008	.0008	.0008
			RPM	17520	13140	6570	6570	19200	17280	17280	17280	15360	15360	19200	19200	19200	19200	17280	17280	17280
			IPM(FEED)	23	15	7	7	32	26	26	26	21	21	36	36	36	36	29	29	29
			Ap	.0006	.0004	.0004	.0004	.0035	.0020	.0020	.0013	.0013	.0007	.0053	.0037	.0037	.0037	.0021	.0021	.0021
H	38.1-38.2	Hardened steel	SFM(Vc)	180	135	70	70	230	210	210	210	185	185	245	245	245	245	225	225	225
			IPT(fz)	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0004	.0006	.0006	.0006	.0006	.0005	.0005	.0005
			RPM	14560	10920	5460	5460	16000	14400	14400	14400	12800	12800	16000	16000	16000	16000	14400	14400	14400
			IPM(FEED)	12	8	3	3	17	14	14	14	11	11	19	19	19	19	15	15	15
			Ap	.0004	.0002	.0002	.0002	.0019	.0011	.0011	.0007	.0007	.0004	.0030	.0021	.0021	.0021	.0012	.0012	.0012
	40	Chilled Cast Iron	SFM(Vc)	205	155	75	75	260	235	235	235	210	210	280	280	280	280	250	250	250
			IPT(fz)	.0005	.0005	.0004	.0004	.0006	.0006	.0006	.0006	.0005	.0005	.0007	.0007	.0007	.0007	.0006	.0006	.0006
			RPM	16560	12420	6210	6210	18100	16290	16290	16290	14480	14480	18100	18100	18100	18100	16290	16290	16290
			IPM(FEED)	18	12	5	5	22	18	18	18	14	14	25	25	25	25	20	20	20
			Ap	.0005	.0003	.0003	.0003	.0027	.0015	.0015	.0010	.0010	.0006	.0041	.0029	.0029	.0029	.0017	.0017	.0017
	41	Hardened Cast Iron	SFM(Vc)	180	135	70	70	230	210	210	210	185	185	245	245	245	245	225	225	225
			IPT(fz)	.0004	.0004	.0003	.0003	.0005	.0005	.0005	.0005	.0004	.0004	.0006	.0006	.0006	.0006	.0005	.0005	.0005
			RPM	14560	10920	5460	5460	16000	14400	14400	14400	12800	12800	16000	16000	16000	16000	14400	14400	14400
			IPM(FEED)	12	8	3	3	17	14	14	14	11	11	19	19	19	19	15	15	15
			Ap	.0004	.0002	.0002	.0002	.0019	.0011	.0011	.0007	.0007	.0004	.0030	.0021	.0021	.0021	.0012	.0012	.0012

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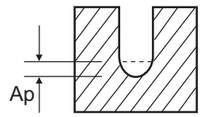
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																			
			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.8	1.8	1.8	1.8	1.8	2	2	2
		LBS	14	16	18	20	22	26	30	8	10	12	16	20	8	10	12	16	20	6	8	10
P	1-8	SFM(Vc)	265	235	235	235	235	180	180	295	265	265	265	235	330	295	295	295	265	295	295	295
		IPT(fz)	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0008	.0008	.0007	.0009	.0008	.0008	.0008	.0007	.0011	.0011	.0011
		RPM	17280	15360	15360	15360	15360	11520	11520	17800	16020	16020	16020	14240	17800	16020	16020	16020	14240	14400	14400	14400
		IPM(FEED)	29	23	23	23	23	15	15	33	27	27	27	21	33	27	27	27	21	32	32	32
		Ap	.0013	.0013	.0013	.0008	.0008	.0006	.0006	.0040	.0023	.0023	.0014	.0014	.0044	.0026	.0026	.0016	.0016	.0071	.0050	.0050
	9	SFM(Vc)	250	225	225	225	225	170	170	275	250	250	250	220	310	280	280	280	250	280	280	280
		IPT(fz)	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0008	.0007	.0007	.0007	.0006	.0008	.0007	.0007	.0007	.0006	.0009	.0009	.0009
		RPM	16290	14480	14480	14480	14480	10860	10860	16800	15120	15120	15120	13440	16800	15120	15120	15120	13440	13600	13600	13600
		IPM(FEED)	20	16	16	16	16	10	10	26	21	21	21	17	26	21	21	21	17	24	24	24
		Ap	.0010	.0010	.0010	.0006	.0006	.0004	.0004	.0031	.0018	.0018	.0011	.0011	.0035	.0020	.0020	.0013	.0013	.0055	.0039	.0039
	10	SFM(Vc)	265	235	235	235	235	180	180	295	265	265	265	235	330	295	295	295	265	295	295	295
		IPT(fz)	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0008	.0008	.0007	.0009	.0008	.0008	.0008	.0007	.0011	.0011	.0011
		RPM	17280	15360	15360	15360	15360	11520	11520	17800	16020	16020	16020	14240	17800	16020	16020	16020	14240	14400	14400	14400
		IPM(FEED)	29	23	23	23	23	15	15	33	27	27	27	21	33	27	27	27	21	32	32	32
		Ap	.0013	.0013	.0013	.0008	.0008	.0006	.0006	.0040	.0023	.0023	.0014	.0014	.0044	.0026	.0026	.0016	.0016	.0071	.0050	.0050
	11.1-11.2	SFM(Vc)	250	225	225	225	225	170	170	275	250	250	250	220	310	280	280	280	250	280	280	280
		IPT(fz)	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0008	.0007	.0007	.0007	.0006	.0008	.0007	.0007	.0007	.0006	.0009	.0009	.0009
		RPM	16290	14480	14480	14480	14480	10860	10860	16800	15120	15120	15120	13440	16800	15120	15120	15120	13440	13600	13600	13600
		IPM(FEED)	20	16	16	16	16	10	10	26	21	21	21	17	26	21	21	21	17	24	24	24
		Ap	.0010	.0010	.0010	.0006	.0006	.0004	.0004	.0031	.0018	.0018	.0011	.0011	.0035	.0020	.0020	.0013	.0013	.0055	.0039	.0039
K	15-20	SFM(Vc)	265	235	235	235	235	180	180	295	265	265	265	235	330	295	295	295	265	295	295	295
		IPT(fz)	.0008	.0007	.0007	.0007	.0007	.0007	.0007	.0009	.0008	.0008	.0008	.0007	.0009	.0008	.0008	.0008	.0007	.0011	.0011	.0011
		RPM	17280	15360	15360	15360	15360	11520	11520	17800	16020	16020	16020	14240	17800	16020	16020	16020	14240	14400	14400	14400
		IPM(FEED)	29	23	23	23	23	15	15	33	27	27	27	21	33	27	27	27	21	32	32	32
		Ap	.0013	.0013	.0013	.0008	.0008	.0006	.0006	.0040	.0023	.0023	.0014	.0014	.0044	.0026	.0026	.0016	.0016	.0071	.0050	.0050
H	38.1-38.2	SFM(Vc)	225	200	200	200	200	150	150	245	220	220	220	195	275	245	245	245	220	245	245	245
		IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0006	.0006	.0006	.0005	.0007	.0006	.0006	.0006	.0005	.0008	.0008	.0008
		RPM	14400	12800	12800	12800	12800	9600	9600	14800	13320	13320	13320	11840	14800	13320	13320	13320	11840	12000	12000	12000
		IPM(FEED)	15	12	12	12	12	8	8	19	16	16	16	12	19	16	16	16	12	19	19	19
		Ap	.0007	.0007	.0007	.0004	.0004	.0003	.0003	.0022	.0013	.0013	.0008	.0008	.0025	.0014	.0014	.0009	.0009	.0039	.0028	.0028
	40	SFM(Vc)	250	225	225	225	225	170	170	275	250	250	250	220	310	280	280	280	250	280	280	280
		IPT(fz)	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0008	.0007	.0007	.0007	.0006	.0008	.0007	.0007	.0007	.0006	.0009	.0009	.0009
		RPM	16290	14480	14480	14480	14480	10860	10860	16800	15120	15120	15120	13440	16800	15120	15120	15120	13440	13600	13600	13600
		IPM(FEED)	20	16	16	16	16	10	10	26	21	21	21	17	26	21	21	21	17	24	24	24
		Ap	.0010	.0010	.0010	.0006	.0006	.0004	.0004	.0031	.0018	.0018	.0011	.0011	.0035	.0020	.0020	.0013	.0013	.0055	.0039	.0039
	41	SFM(Vc)	225	200	200	200	200	150	150	245	220	220	220	195	275	245	245	245	220	245	245	245
		IPT(fz)	.0005	.0005	.0005	.0005	.0005	.0004	.0004	.0007	.0006	.0006	.0006	.0005	.0007	.0006	.0006	.0006	.0005	.0008	.0008	.0008
		RPM	14400	12800	12800	12800	12800	9600	9600	14800	13320	13320	13320	11840	14800	13320	13320	13320	11840	12000	12000	12000
		IPM(FEED)	15	12	12	12	12	8	8	19	16	16	16	12	19	16	16	16	12	19	19	19
		Ap	.0007	.0007	.0007	.0004	.0004	.0003	.0003	.0022	.0013	.0013	.0008	.0008	.0025	.0014	.0014	.0009	.0009	.0039	.0028	.0028

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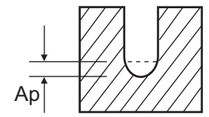
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				2	2	2	2	2	2	2	2	2	2	2	2	2.5	2.5	2.5	2.5
			LBS	12	14	16	18	20	22	26	30	35	40	45	50	60	8	10	12	14
P	1-8	Non-alloy steel	SFM(Vc)	265	265	265	265	265	235	235	235	180	180	90	90	90	315	315	315	285
			IPT(fz)	.0010	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0007	.0016	.0016	.0016	.0014
			RPM	12960	12960	12960	12960	12960	11520	11520	11520	8640	8640	4320	4320	4320	12300	12300	12300	11070
			IPM(FEED)	26	26	26	26	26	21	21	21	14	14	6	6	6	38	38	38	31
			Ap	.0028	.0028	.0028	.0018	.0018	.0018	.0018	.0011	.0007	.0007	.0007	.0007	.0007	.0062	.0062	.0062	.0035
	9	Low alloy steel	SFM(Vc)	250	250	250	250	250	225	225	225	170	170	85	85	85	300	300	300	270
			IPT(fz)	.0008	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0012	.0012	.0012	.0010
			RPM	12240	12240	12240	12240	12240	10880	10880	10880	8160	8160	4080	4080	4080	11600	11600	11600	10440
			IPM(FEED)	20	20	20	20	20	16	16	16	10	10	4	4	4	27	27	27	22
			Ap	.0022	.0022	.0022	.0014	.0014	.0014	.0014	.0008	.0006	.0006	.0006	.0006	.0006	.0048	.0048	.0048	.0028
	10	High alloyed steel, and tool steel	SFM(Vc)	265	265	265	265	265	235	235	235	180	180	90	90	90	315	315	315	285
			IPT(fz)	.0010	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0007	.0016	.0016	.0016	.0014
			RPM	12960	12960	12960	12960	12960	11520	11520	11520	8640	8640	4320	4320	4320	12300	12300	12300	11070
			IPM(FEED)	26	26	26	26	26	21	21	21	14	14	6	6	6	38	38	38	31
			Ap	.0028	.0028	.0028	.0018	.0018	.0018	.0018	.0011	.0007	.0007	.0007	.0007	.0007	.0062	.0062	.0062	.0035
	11.1-11.2		SFM(Vc)	250	250	250	250	250	225	225	225	170	170	85	85	85	300	300	300	270
			IPT(fz)	.0008	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0012	.0012	.0012	.0010
			RPM	12240	12240	12240	12240	12240	10880	10880	10880	8160	8160	4080	4080	4080	11600	11600	11600	10440
			IPM(FEED)	20	20	20	20	20	16	16	16	10	10	4	4	4	27	27	27	22
			Ap	.0022	.0022	.0022	.0014	.0014	.0014	.0014	.0008	.0006	.0006	.0006	.0006	.0006	.0048	.0048	.0048	.0028
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	265	265	265	265	265	235	235	235	180	180	90	90	90	315	315	315	285
			IPT(fz)	.0010	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0007	.0007	.0007	.0016	.0016	.0016	.0014
			RPM	12960	12960	12960	12960	12960	11520	11520	11520	8640	8640	4320	4320	4320	12300	12300	12300	11070
			IPM(FEED)	26	26	26	26	26	21	21	21	14	14	6	6	6	38	38	38	31
			Ap	.0028	.0028	.0028	.0018	.0018	.0018	.0018	.0011	.0007	.0007	.0007	.0007	.0007	.0062	.0062	.0062	.0035
H	38.1-38.2	Hardened steel	SFM(Vc)	225	225	225	225	225	200	200	200	150	150	75	75	75	265	265	265	240
			IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0010	.0010	.0010	.0009
			RPM	10800	10800	10800	10800	10800	9600	9600	9600	7200	7200	3600	3600	3600	10300	10300	10300	9270
			IPM(FEED)	15	15	15	15	15	12	12	12	8	8	3	3	3	20	20	20	16
			Ap	.0016	.0016	.0016	.0010	.0010	.0010	.0010	.0006	.0004	.0004	.0004	.0004	.0004	.0035	.0035	.0035	.0020
	40	Chilled Cast Iron	SFM(Vc)	250	250	250	250	250	225	225	225	170	170	85	85	85	300	300	300	270
			IPT(fz)	.0008	.0008	.0008	.0008	.0008	.0007	.0007	.0007	.0006	.0006	.0005	.0005	.0005	.0012	.0012	.0012	.0010
			RPM	12240	12240	12240	12240	12240	10880	10880	10880	8160	8160	4080	4080	4080	11600	11600	11600	10440
			IPM(FEED)	20	20	20	20	20	16	16	16	10	10	4	4	4	27	27	27	22
			Ap	.0022	.0022	.0022	.0014	.0014	.0014	.0014	.0008	.0006	.0006	.0006	.0006	.0006	.0048	.0048	.0048	.0028
	41	Hardened Cast Iron	SFM(Vc)	225	225	225	225	225	200	200	200	150	150	75	75	75	265	265	265	240
			IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0010	.0010	.0010	.0009
			RPM	10800	10800	10800	10800	10800	9600	9600	9600	7200	7200	3600	3600	3600	10300	10300	10300	9270
			IPM(FEED)	15	15	15	15	15	12	12	12	8	8	3	3	3	20	20	20	16
			Ap	.0016	.0016	.0016	.0010	.0010	.0010	.0010	.0006	.0004	.0004	.0004	.0004	.0004	.0035	.0035	.0035	.0020

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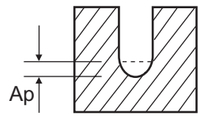
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)																
			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	3	3	3	3	3
		LBS	16	18	20	22	26	30	35	40	45	50	6	8	10	12	14	16	18	20	22	26
P	1-8	SFM(Vc)	285	285	285	285	255	255	255	190	190	190	335	335	335	335	335	305	305	305	305	305
		IPT(fz)	.0014	.0014	.0014	.0014	.0012	.0012	.0012	.0011	.0011	.0011	.0016	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0014	.0014
		RPM	11070	11070	11070	11070	9840	9840	9840	7380	7380	7380	10900	10900	10900	10900	10900	9810	9810	9810	9810	9810
		IPM(FEED)	31	31	31	31	24	24	24	16	16	16	34	34	34	34	34	27	27	27	27	27
		Ap	.0035	.0035	.0035	.0022	.0022	.0022	.0013	.0013	.0009	.0009	.0106	.0106	.0074	.0074	.0074	.0043	.0043	.0043	.0043	.0027
	9	SFM(Vc)	270	270	270	270	240	240	240	180	180	180	320	320	320	320	320	285	285	285	285	285
		IPT(fz)	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0012	.0012	.0012	.0012	.0012	.0010	.0010	.0010	.0010	.0010
		RPM	10440	10440	10440	10440	9280	9280	9280	6960	6960	6960	10300	10300	10300	10300	10300	9270	9270	9270	9270	9270
		IPM(FEED)	22	22	22	22	17	17	17	11	11	11	24	24	24	24	24	19	19	19	19	19
		Ap	.0028	.0028	.0028	.0017	.0017	.0017	.0010	.0010	.0007	.0007	.0083	.0083	.0058	.0058	.0058	.0033	.0033	.0033	.0033	.0021
	10	SFM(Vc)	285	285	285	285	255	255	255	190	190	190	335	335	335	335	335	305	305	305	305	305
		IPT(fz)	.0014	.0014	.0014	.0014	.0012	.0012	.0012	.0011	.0011	.0011	.0016	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0014	.0014
		RPM	11070	11070	11070	11070	9840	9840	9840	7380	7380	7380	10900	10900	10900	10900	10900	9810	9810	9810	9810	9810
		IPM(FEED)	31	31	31	31	24	24	24	16	16	16	34	34	34	34	34	27	27	27	27	27
		Ap	.0035	.0035	.0035	.0022	.0022	.0022	.0013	.0013	.0009	.0009	.0106	.0106	.0074	.0074	.0074	.0043	.0043	.0043	.0043	.0027
	11.1-11.2	SFM(Vc)	270	270	270	270	240	240	240	180	180	180	320	320	320	320	320	285	285	285	285	285
		IPT(fz)	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0012	.0012	.0012	.0012	.0012	.0010	.0010	.0010	.0010	.0010
		RPM	10440	10440	10440	10440	9280	9280	9280	6960	6960	6960	10300	10300	10300	10300	10300	9270	9270	9270	9270	9270
		IPM(FEED)	22	22	22	22	17	17	17	11	11	11	24	24	24	24	24	19	19	19	19	19
		Ap	.0028	.0028	.0028	.0017	.0017	.0017	.0010	.0010	.0007	.0007	.0083	.0083	.0058	.0058	.0058	.0033	.0033	.0033	.0033	.0021
K	15-20	SFM(Vc)	285	285	285	285	255	255	255	190	190	190	335	335	335	335	335	305	305	305	305	305
		IPT(fz)	.0014	.0014	.0014	.0014	.0012	.0012	.0012	.0011	.0011	.0011	.0016	.0016	.0016	.0016	.0016	.0014	.0014	.0014	.0014	.0014
		RPM	11070	11070	11070	11070	9840	9840	9840	7380	7380	7380	10900	10900	10900	10900	10900	9810	9810	9810	9810	9810
		IPM(FEED)	31	31	31	31	24	24	24	16	16	16	34	34	34	34	34	27	27	27	27	27
		Ap	.0035	.0035	.0035	.0022	.0022	.0022	.0013	.0013	.0009	.0009	.0106	.0106	.0074	.0074	.0074	.0043	.0043	.0043	.0043	.0027
H	38.1-38.2	SFM(Vc)	240	240	240	240	210	210	210	160	160	160	205	205	205	205	205	185	185	185	185	185
		IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0013	.0013	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0012
		RPM	9270	9270	9270	9270	8240	8240	8240	6180	6180	6180	6600	6600	6600	6600	6600	5940	5940	5940	5940	5940
		IPM(FEED)	16	16	16	16	13	13	13	9	9	9	18	18	18	18	18	14	14	14	14	14
		Ap	.0020	.0020	.0020	.0012	.0012	.0012	.0007	.0007	.0005	.0005	.0059	.0059	.0041	.0041	.0041	.0024	.0024	.0024	.0024	.0015
	40	SFM(Vc)	270	270	270	270	240	240	240	180	180	180	320	320	320	320	320	285	285	285	285	285
		IPT(fz)	.0010	.0010	.0010	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0012	.0012	.0012	.0012	.0012	.0010	.0010	.0010	.0010	.0010
		RPM	10440	10440	10440	10440	9280	9280	9280	6960	6960	6960	10300	10300	10300	10300	10300	9270	9270	9270	9270	9270
		IPM(FEED)	22	22	22	22	17	17	17	11	11	11	24	24	24	24	24	19	19	19	19	19
		Ap	.0028	.0028	.0028	.0017	.0017	.0017	.0010	.0010	.0007	.0007	.0083	.0083	.0058	.0058	.0058	.0033	.0033	.0033	.0033	.0021
	41	SFM(Vc)	240	240	240	240	210	210	210	160	160	160	205	205	205	205	205	185	185	185	185	185
		IPT(fz)	.0009	.0009	.0009	.0009	.0008	.0008	.0008	.0007	.0007	.0007	.0013	.0013	.0013	.0013	.0013	.0012	.0012	.0012	.0012	.0012
		RPM	9270	9270	9270	9270	8240	8240	8240	6180	6180	6180	6600	6600	6600	6600	6600	5940	5940	5940	5940	5940
		IPM(FEED)	16	16	16	16	13	13	13	9	9	9	18	18	18	18	18	14	14	14	14	14
		Ap	.0020	.0020	.0020	.0012	.0012	.0012	.0007	.0007	.0005	.0005	.0059	.0059	.0041	.0041	.0041	.0024	.0024	.0024	.0024	.0015

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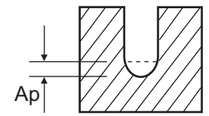
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)																
				3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4
			LBS	30	35	40	45	50	60	8	10	12	14	16	18	20	22	26	30	35
P	1-8	Non-alloy steel	SFM(Vc)	305	270	270	270	200	200	330	330	330	330	330	330	330	295	295	295	295
			IPT(fz)	.0014	.0012	.0012	.0012	.0011	.0011	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0029	.0029
			RPM	9810	8720	8720	8720	6540	6540	8000	8000	8000	8000	8000	8000	8000	7200	7200	7200	7200
			IPM(FEED)	27	22	22	22	14	14	51	51	51	51	51	51	51	42	42	42	42
			Ap	.0027	.0027	.0016	.0016	.0011	.0011	.0142	.0142	.0142	.0099	.0099	.0099	.0099	.0057	.0057	.0057	.0035
	9	Low alloy steel	SFM(Vc)	285	255	255	255	190	190	315	315	315	315	315	315	315	280	280	280	280
			IPT(fz)	.0010	.0009	.0009	.0009	.0008	.0008	.0030	.0030	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0027	.0027
			RPM	9270	8240	8240	8240	6180	6180	7600	7600	7600	7600	7600	7600	7600	6840	6840	6840	6840
			IPM(FEED)	19	15	15	15	10	10	46	46	46	46	46	46	46	37	37	37	37
			Ap	.0021	.0021	.0013	.0013	.0008	.0008	.0110	.0110	.0110	.0077	.0077	.0077	.0077	.0044	.0044	.0044	.0028
	10	High alloyed steel, and tool steel	SFM(Vc)	305	270	270	270	200	200	330	330	330	330	330	330	330	295	295	295	295
			IPT(fz)	.0014	.0012	.0012	.0012	.0011	.0011	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0029	.0029
			RPM	9810	8720	8720	8720	6540	6540	8000	8000	8000	8000	8000	8000	8000	7200	7200	7200	7200
			IPM(FEED)	27	22	22	22	14	14	51	51	51	51	51	51	51	42	42	42	42
			Ap	.0027	.0027	.0016	.0016	.0011	.0011	.0142	.0142	.0142	.0099	.0099	.0099	.0099	.0057	.0057	.0057	.0035
	11.1-11.2		SFM(Vc)	285	255	255	255	190	190	315	315	315	315	315	315	315	280	280	280	280
			IPT(fz)	.0010	.0009	.0009	.0009	.0008	.0008	.0030	.0030	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0027	.0027
			RPM	9270	8240	8240	8240	6180	6180	7600	7600	7600	7600	7600	7600	7600	6840	6840	6840	6840
			IPM(FEED)	19	15	15	15	10	10	46	46	46	46	46	46	46	37	37	37	37
			Ap	.0021	.0021	.0013	.0013	.0008	.0008	.0110	.0110	.0110	.0077	.0077	.0077	.0077	.0044	.0044	.0044	.0028
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	305	270	270	270	200	200	330	330	330	330	330	330	330	295	295	295	295
			IPT(fz)	.0014	.0012	.0012	.0012	.0011	.0011	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0029	.0029	.0029	.0029
			RPM	9810	8720	8720	8720	6540	6540	8000	8000	8000	8000	8000	8000	8000	7200	7200	7200	7200
			IPM(FEED)	27	22	22	22	14	14	51	51	51	51	51	51	51	42	42	42	42
			Ap	.0027	.0027	.0016	.0016	.0011	.0011	.0142	.0142	.0142	.0099	.0099	.0099	.0099	.0057	.0057	.0057	.0035
H	38.1-38.2	Hardened steel	SFM(Vc)	185	165	165	165	120	120	275	275	275	275	275	275	275	250	250	250	250
			IPT(fz)	.0012	.0011	.0011	.0011	.0009	.0009	.0023	.0023	.0023	.0023	.0023	.0023	.0023	.0020	.0020	.0020	.0020
			RPM	5940	5280	5280	5280	3960	3960	6700	6700	6700	6700	6700	6700	6700	6030	6030	6030	6030
			IPM(FEED)	14	11	11	11	8	8	30	30	30	30	30	30	30	25	25	25	25
			Ap	.0015	.0015	.0009	.0009	.0006	.0006	.0079	.0079	.0079	.0055	.0055	.0055	.0055	.0031	.0031	.0031	.0020
	40	Chilled Cast Iron	SFM(Vc)	285	255	255	255	190	190	315	315	315	315	315	315	315	280	280	280	280
			IPT(fz)	.0010	.0009	.0009	.0009	.0008	.0008	.0030	.0030	.0030	.0030	.0030	.0030	.0030	.0027	.0027	.0027	.0027
			RPM	9270	8240	8240	8240	6180	6180	7600	7600	7600	7600	7600	7600	7600	6840	6840	6840	6840
			IPM(FEED)	19	15	15	15	10	10	46	46	46	46	46	46	46	37	37	37	37
			Ap	.0021	.0021	.0013	.0013	.0008	.0008	.0110	.0110	.0110	.0077	.0077	.0077	.0077	.0044	.0044	.0044	.0028
	41	Hardened Cast Iron	SFM(Vc)	185	165	165	165	120	120	275	275	275	275	275	275	275	250	250	250	250
			IPT(fz)	.0012	.0011	.0011	.0011	.0009	.0009	.0023	.0023	.0023	.0023	.0023	.0023	.0023	.0020	.0020	.0020	.0020
			RPM	5940	5280	5280	5280	3960	3960	6700	6700	6700	6700	6700	6700	6700	6030	6030	6030	6030
			IPM(FEED)	14	11	11	11	8	8	30	30	30	30	30	30	30	25	25	25	25
			Ap	.0015	.0015	.0009	.0009	.0006	.0006	.0079	.0079	.0079	.0055	.0055	.0055	.0055	.0031	.0031	.0031	.0020

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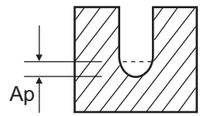
(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)															
			4	4	4	4	5	5	5	5	5	5	5	5	6	6
		LBS	40	45	50	60	16	20	26	30	35	40	50	60	15	20
P	1-8	SFM(Vc)	295	265	265	265	330	330	295	295	295	295	295	265	330	330
		IPT(fz)	.0029	.0026	.0026	.0026	.0036	.0036	.0032	.0032	.0032	.0032	.0032	.0028	.0039	.0039
		RPM	7200	6400	6400	6400	6400	6400	5760	5760	5760	5760	5760	5120	5300	5300
		IPM(FEED)	42	33	33	33	46	46	37	37	37	37	37	29	42	42
		Ap	.0035	.0035	.0035	.0021	.0124	.0124	.0071	.0071	.0071	.0071	.0044	.0044	.0213	.0149
	9	SFM(Vc)	280	250	250	250	315	315	285	285	285	285	285	250	310	310
		IPT(fz)	.0027	.0024	.0024	.0024	.0029	.0029	.0026	.0026	.0026	.0026	.0026	.0023	.0032	.0032
		RPM	6840	6080	6080	6080	6100	6100	5490	5490	5490	5490	5490	4880	5000	5000
		IPM(FEED)	37	29	29	29	35	35	29	29	29	29	29	23	32	32
		Ap	.0028	.0028	.0028	.0017	.0096	.0096	.0055	.0055	.0055	.0055	.0035	.0035	.0165	.0116
	10	SFM(Vc)	295	265	265	265	330	330	295	295	295	295	295	265	330	330
		IPT(fz)	.0029	.0026	.0026	.0026	.0036	.0036	.0032	.0032	.0032	.0032	.0032	.0028	.0039	.0039
		RPM	7200	6400	6400	6400	6400	6400	5760	5760	5760	5760	5760	5120	5300	5300
		IPM(FEED)	42	33	33	33	46	46	37	37	37	37	37	29	42	42
		Ap	.0035	.0035	.0035	.0021	.0124	.0124	.0071	.0071	.0071	.0071	.0044	.0044	.0213	.0149
	11.1-11.2	SFM(Vc)	280	250	250	250	315	315	285	285	285	285	285	250	310	310
		IPT(fz)	.0027	.0024	.0024	.0024	.0029	.0029	.0026	.0026	.0026	.0026	.0026	.0023	.0032	.0032
		RPM	6840	6080	6080	6080	6100	6100	5490	5490	5490	5490	5490	4880	5000	5000
		IPM(FEED)	37	29	29	29	35	35	29	29	29	29	29	23	32	32
		Ap	.0028	.0028	.0028	.0017	.0096	.0096	.0055	.0055	.0055	.0055	.0035	.0035	.0165	.0116
K	15-20	SFM(Vc)	295	265	265	265	330	330	295	295	295	295	295	265	330	330
		IPT(fz)	.0029	.0026	.0026	.0026	.0036	.0036	.0032	.0032	.0032	.0032	.0032	.0028	.0039	.0039
		RPM	7200	6400	6400	6400	6400	6400	5760	5760	5760	5760	5760	5120	5300	5300
		IPM(FEED)	42	33	33	33	46	46	37	37	37	37	37	29	42	42
		Ap	.0035	.0035	.0035	.0021	.0124	.0124	.0071	.0071	.0071	.0071	.0044	.0044	.0213	.0149
H	38.1-38.2	SFM(Vc)	250	220	220	220	280	280	250	250	250	250	250	225	270	270
		IPT(fz)	.0020	.0018	.0018	.0018	.0022	.0022	.0020	.0020	.0020	.0020	.0020	.0018	.0025	.0025
		RPM	6030	5360	5360	5360	5400	5400	4860	4860	4860	4860	4860	4320	4400	4400
		IPM(FEED)	25	20	20	20	24	24	19	19	19	19	19	15	22	22
		Ap	.0020	.0020	.0020	.0012	.0069	.0069	.0039	.0039	.0039	.0039	.0025	.0025	.0118	.0083
	40	SFM(Vc)	280	250	250	250	315	315	285	285	285	285	285	250	310	310
		IPT(fz)	.0027	.0024	.0024	.0024	.0029	.0029	.0026	.0026	.0026	.0026	.0026	.0023	.0032	.0032
		RPM	6840	6080	6080	6080	6100	6100	5490	5490	5490	5490	5490	4880	5000	5000
		IPM(FEED)	37	29	29	29	35	35	29	29	29	29	29	23	32	32
		Ap	.0028	.0028	.0028	.0017	.0096	.0096	.0055	.0055	.0055	.0055	.0035	.0035	.0165	.0116
	41	SFM(Vc)	250	220	220	220	280	280	250	250	250	250	250	225	270	270
		IPT(fz)	.0020	.0018	.0018	.0018	.0022	.0022	.0020	.0020	.0020	.0020	.0020	.0018	.0025	.0025
		RPM	6030	5360	5360	5360	5400	5400	4860	4860	4860	4860	4860	4320	4400	4400
		IPM(FEED)	25	20	20	20	24	24	19	19	19	19	19	15	22	22
		Ap	.0020	.0020	.0020	.0012	.0069	.0069	.0039	.0039	.0039	.0039	.0025	.0025	.0118	.0083

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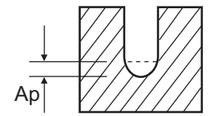
(Depth of Cut per one pass)



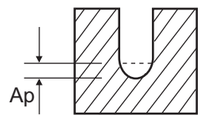
4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEM845 SERIES — 2 FLUTE SQUARE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)										
				6	6	8	8	8	10	10	10	12	12	12
			LBS	30	32	25	30	42	30	35	45	35	40	50
P	1-8	Non-alloy steel	SFM(Vc)	330	295	330	330	295	330	330	330	330	330	330
			IPT(fz)	.0039	.0035	.0047	.0047	.0042	.0055	.0055	.0055	.0059	.0059	.0059
			RPM	5300	4770	4000	4000	3600	3200	3200	3200	2650	2650	2650
			IPM(FEED)	42	34	37	37	30	35	35	35	32	32	32
			Ap	.0149	.0085	.0198	.0198	.0113	.0354	.0248	.0248	.0425	.0298	.0298
	9	Low alloy steel	SFM(Vc)	310	280	315	315	280	315	315	315	310	310	310
			IPT(fz)	.0032	.0029	.0039	.0039	.0035	.0044	.0044	.0044	.0047	.0047	.0047
			RPM	5000	4500	3800	3800	3400	3050	3050	3050	2520	2520	2520
			IPM(FEED)	32	26	30	30	24	27	27	27	24	24	24
			Ap	.0116	.0066	.0154	.0154	.0088	.0276	.0193	.0193	.0331	.0231	.0231
	10	High alloyed steel, and tool steel	SFM(Vc)	330	295	330	330	295	330	330	330	330	330	330
			IPT(fz)	.0039	.0035	.0047	.0047	.0042	.0055	.0055	.0055	.0059	.0059	.0059
			RPM	5300	4770	4000	4000	3600	3200	3200	3200	2650	2650	2650
			IPM(FEED)	42	34	37	37	30	35	35	35	32	32	32
			Ap	.0149	.0085	.0198	.0198	.0113	.0354	.0248	.0248	.0425	.0298	.0298
	11.1-11.2		SFM(Vc)	310	280	315	315	280	315	315	315	310	310	310
			IPT(fz)	.0032	.0029	.0039	.0039	.0035	.0044	.0044	.0044	.0047	.0047	.0047
			RPM	5000	4500	3800	3800	3400	3050	3050	3050	2520	2520	2520
			IPM(FEED)	32	26	30	30	24	27	27	27	24	24	24
			Ap	.0116	.0066	.0154	.0154	.0088	.0276	.0193	.0193	.0331	.0231	.0231
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	330	295	330	330	295	330	330	330	330	330	330
			IPT(fz)	.0039	.0035	.0047	.0047	.0042	.0055	.0055	.0055	.0059	.0059	.0059
			RPM	5300	4770	4000	4000	3600	3200	3200	3200	2650	2650	2650
			IPM(FEED)	42	34	37	37	30	35	35	35	32	32	32
			Ap	.0149	.0085	.0198	.0198	.0113	.0354	.0248	.0248	.0425	.0298	.0298
H	38.1-38.2	Hardened steel	SFM(Vc)	270	245	270	270	245	270	270	270	270	270	270
			IPT(fz)	.0025	.0022	.0030	.0030	.0027	.0030	.0030	.0030	.0032	.0032	.0032
			RPM	4400	3960	3300	3300	2950	2630	2630	2630	2180	2180	2180
			IPM(FEED)	22	18	20	20	16	16	16	16	14	14	14
			Ap	.0083	.0047	.0110	.0110	.0063	.0197	.0138	.0138	.0236	.0165	.0165
	40	Chilled Cast Iron	SFM(Vc)	310	280	315	315	280	315	315	315	310	310	310
			IPT(fz)	.0032	.0029	.0039	.0039	.0035	.0044	.0044	.0044	.0047	.0047	.0047
			RPM	5000	4500	3800	3800	3400	3050	3050	3050	2520	2520	2520
			IPM(FEED)	32	26	30	30	24	27	27	27	24	24	24
			Ap	.0116	.0066	.0154	.0154	.0088	.0276	.0193	.0193	.0331	.0231	.0231
	41	Hardened Cast Iron	SFM(Vc)	270	245	270	270	245	270	270	270	270	270	270
			IPT(fz)	.0025	.0022	.0030	.0030	.0027	.0030	.0030	.0030	.0032	.0032	.0032
			RPM	4400	3960	3300	3300	2950	2630	2630	2630	2180	2180	2180
			IPM(FEED)	22	18	20	20	16	16	16	16	14	14	14
			Ap	.0083	.0047	.0110	.0110	.0063	.0197	.0138	.0138	.0236	.0165	.0165

(Depth of Cut per one pass)



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME36, SEME71 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						0.8	0.9	1	1.2	1.5	2	2.5	3	3.5	4	4.5	5	5.5
P	1-8	Non-alloy steel	0.05D	1D	SFM(Vc)	260	270	275	280	290	300	330	345	370	390	400	405	420
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0008	.0009
					RPM	31250	29300	26800	22500	18750	14450	12800	11150	10300	9450	8660	7880	7410
					IPM(FEED)	9	10	10	10	11	12	12	13	18	24	24	25	26
	9	Low alloy steel	0.05D	1D	SFM(Vc)	155	165	165	165	175	195	210	215	230	240	245	245	255
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0008	.0009
					RPM	18750	17580	16080	13500	11250	9450	8200	6950	6360	5780	5250	4730	4460
					IPM(FEED)	6	6	6	6	7	7	8	8	11	15	15	15	16
	10	High alloyed steel, and tool steel	0.05D	1D	SFM(Vc)	260	270	275	280	290	300	330	345	370	390	400	405	420
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0008	.0009
					RPM	31250	29300	26800	22500	18750	14450	12800	11150	10300	9450	8660	7880	7410
					IPM(FEED)	9	10	10	10	11	12	12	13	18	24	24	25	26
	11.1-11.2		0.05D	1D	SFM(Vc)	155	165	165	165	175	195	210	215	230	240	245	245	255
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0008	.0009
					RPM	18750	17580	16080	13500	11250	9450	8200	6950	6360	5780	5250	4730	4460
					IPM(FEED)	6	6	6	6	7	7	8	8	11	15	15	15	16
M	14.1	Stainless steel	0.05D	1D	SFM(Vc)	130	135	140	140	145	160	175	180	190	200	205	205	215
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0008	.0009
					RPM	15630	14650	13400	11250	9380	7880	6830	5780	5310	4850	4400	3950	3750
					IPM(FEED)	5	5	5	5	5	6	7	7	9	12	12	12	13
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1D	SFM(Vc)	260	270	275	280	290	300	330	345	370	390	400	405	420
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0008	.0009
					RPM	31250	29300	26800	22500	18750	14450	12800	11150	10300	9450	8660	7880	7410
					IPM(FEED)	9	10	10	10	11	12	12	13	18	24	24	25	26
H	38.1-38.2	Hardened steel	0.05D	1D	SFM(Vc)	105	110	110	110	115	130	135	130	140	150	155	150	155
					IPT(fz)	.00003	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003
					RPM	12500	11720	10720	9000	7500	6300	5250	4200	3940	3680	3290	2900	2700
					IPM(FEED)	2	2	2	2	2	2	2	3	3	3	3	3	3
	40	Chilled Cast Iron	0.05D	1D	SFM(Vc)	155	165	165	165	175	195	210	215	230	240	245	245	255
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0008	.0009
					RPM	18750	17580	16080	13500	11250	9450	8200	6950	6360	5780	5250	4730	4460
					IPM(FEED)	6	6	6	6	7	7	8	8	11	15	15	15	16
	41	Hardened Cast Iron	0.05D	1D	SFM(Vc)	105	110	110	110	115	130	135	130	140	150	155	150	155
					IPT(fz)	.00003	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003
					RPM	12500	11720	10720	9000	7500	6300	5250	4200	3940	3680	3290	2900	2700
					IPM(FEED)	2	2	2	2	2	2	2	3	3	3	3	3	3

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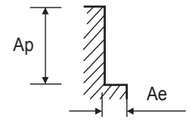

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME36, SEME71 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
P	1-8	Non-alloy steel	0.05D	1D	SFM(Vc)	430	435	440	440	435	435	430	430	420	425	425	425	425
					IPT(fz)	.0010	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0015	.0016	.0016	.0016	.0016
					RPM	6950	6530	6100	5680	5250	4960	4660	4370	4080	3910	3750	3590	3430
					IPM(FEED)	27	28	28	29	29	28	27	26	25	24	23	22	22
	9	Low alloy steel	0.05D	1D	SFM(Vc)	260	265	265	265	260	260	265	260	260	260	260	260	260
					IPT(fz)	.0010	.0011	.0011	.0012	.0012	.0013	.0012	.0012	.0012	.0013	.0012	.0013	.0012
					RPM	4200	3940	3680	3410	3150	2990	2830	2660	2500	2400	2300	2200	2100
					IPM(FEED)	17	17	16	16	16	15	14	13	12	12	11	11	10
	10	High alloyed steel, and tool steel	0.05D	1D	SFM(Vc)	430	435	440	440	435	435	430	430	420	425	425	425	425
					IPT(fz)	.0010	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0015	.0016	.0016	.0016	.0016
					RPM	6950	6530	6100	5680	5250	4960	4660	4370	4080	3910	3750	3590	3430
					IPM(FEED)	27	28	28	29	29	28	27	26	25	24	23	22	22
	11.1-11.2		0.05D	1D	SFM(Vc)	260	265	265	265	260	260	265	260	260	260	260	260	260
					IPT(fz)	.0010	.0011	.0011	.0012	.0012	.0013	.0012	.0012	.0012	.0013	.0012	.0013	.0012
					RPM	4200	3940	3680	3410	3150	2990	2830	2660	2500	2400	2300	2200	2100
					IPM(FEED)	17	17	16	16	16	15	14	13	12	12	11	11	10
M	14.1	Stainless steel	0.05D	1D	SFM(Vc)	220	220	225	220	215	220	220	220	215	215	215	215	210
					IPT(fz)	.0010	.0010	.0011	.0012	.0014	.0014	.0014	.0015	.0015	.0015	.0015	.0015	.0014
					RPM	3550	3320	3090	2860	2630	2490	2360	2230	2100	2000	1900	1800	1700
					IPM(FEED)	14	14	14	14	15	14	13	13	12	12	11	11	10
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1D	SFM(Vc)	430	435	440	440	435	435	430	430	420	425	425	425	425
					IPT(fz)	.0010	.0011	.0012	.0013	.0014	.0014	.0015	.0015	.0015	.0016	.0016	.0016	.0016
					RPM	6950	6530	6100	5680	5250	4960	4660	4370	4080	3910	3750	3590	3430
					IPM(FEED)	27	28	28	29	29	28	27	26	25	24	23	22	22
H	38.1-38.2	Hardened steel	0.05D	1D	SFM(Vc)	155	160	165	170	175	175	175	175	175	175	180	180	180
					IPT(fz)	.0003	.0004	.0004	.0005	.0005	.0005	.0005	.0005	.0005	.0006	.0006	.0006	.0006
					RPM	2500	2400	2300	2200	2100	2000	1900	1800	1700	1640	1580	1510	1450
					IPM(FEED)	3	4	4	4	5	4	4	4	4	4	4	4	3
	40	Chilled Cast Iron	0.05D	1D	SFM(Vc)	260	265	265	265	260	260	265	260	260	260	260	260	260
					IPT(fz)	.0010	.0011	.0011	.0012	.0012	.0013	.0012	.0012	.0012	.0013	.0012	.0013	.0012
					RPM	4200	3940	3680	3410	3150	2990	2830	2660	2500	2400	2300	2200	2100
					IPM(FEED)	17	17	16	16	16	15	14	13	12	12	11	11	10
	41	Hardened Cast Iron	0.05D	1D	SFM(Vc)	155	160	165	170	175	175	175	175	175	175	180	180	180
					IPT(fz)	.0003	.0004	.0004	.0005	.0005	.0005	.0005	.0005	.0005	.0006	.0006	.0006	.0006
					RPM	2500	2400	2300	2200	2100	2000	1900	1800	1700	1640	1580	1510	1450
					IPM(FEED)	3	4	4	4	5	4	4	4	4	4	4	4	3

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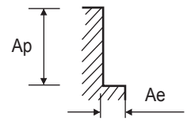
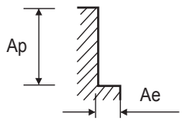


4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
SEME36, SEME71 SERIES — 4 FLUTE SQUARE - SIDE CUTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø) 13	14	15	16	17	18	19	20	21	22	23	24	25
P	1-8	0.05D	1D	SFM(Vc)	435	445	450	455	455	450	445	435	435	440	440	440	440
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0015	.0015
				RPM	3260	3090	2920	2750	2590	2430	2260	2100	2020	1940	1860	1780	1700
				IPM(FEED)	21	19	18	17	16	15	14	13	13	12	12	11	10
	9	0.05D	1D	SFM(Vc)	270	275	280	280	280	280	280	275	275	275	275	275	270
				IPT(fz)	.0012	.0012	.0012	.0013	.0012	.0012	.0013	.0013	.0013	.0013	.0012	.0012	.0013
				RPM	2000	1900	1800	1700	1610	1510	1420	1330	1270	1220	1160	1110	1050
				IPM(FEED)	10	9	9	9	8	8	7	7	7	6	6	6	5
	10	0.05D	1D	SFM(Vc)	435	445	450	455	455	450	445	435	435	440	440	440	440
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0015	.0015
				RPM	3260	3090	2920	2750	2590	2430	2260	2100	2020	1940	1860	1780	1700
				IPM(FEED)	21	19	18	17	16	15	14	13	13	12	12	11	10
	11.1-11.2	0.05D	1D	SFM(Vc)	270	275	280	280	280	280	280	275	275	275	275	275	270
				IPT(fz)	.0012	.0012	.0012	.0013	.0012	.0012	.0013	.0013	.0013	.0013	.0012	.0012	.0013
				RPM	2000	1900	1800	1700	1610	1510	1420	1330	1270	1220	1160	1110	1050
				IPM(FEED)	10	9	9	9	8	8	7	7	7	6	6	6	5
M	14.1	0.05D	1D	SFM(Vc)	215	220	225	230	225	225	220	215	220	220	220	220	220
				IPT(fz)	.0015	.0015	.0015	.0015	.0015	.0015	.0015	.0015	.0015	.0015	.0015	.0014	.0014
				RPM	1620	1540	1460	1380	1290	1210	1130	1050	1010	970	930	890	850
				IPM(FEED)	9	9	9	8	8	7	7	6	6	6	6	5	5
K	15-20	0.05D	1D	SFM(Vc)	435	445	450	455	455	450	445	435	435	440	440	440	440
				IPT(fz)	.0016	.0016	.0015	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0016	.0015	.0015
				RPM	3260	3090	2920	2750	2590	2430	2260	2100	2020	1940	1860	1780	1700
				IPM(FEED)	21	19	18	17	16	15	14	13	13	12	12	11	10
H	38.1-38.2	0.05D	1D	SFM(Vc)	185	185	185	185	185	185	180	175	175	175	180	175	175
				IPT(fz)	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0005
				RPM	1370	1290	1210	1130	1060	990	920	850	820	780	750	710	680
				IPM(FEED)	3	3	3	3	2	2	2	2	2	2	2	1	1
	40	0.05D	1D	SFM(Vc)	270	275	280	280	280	280	280	275	275	275	275	275	270
				IPT(fz)	.0012	.0012	.0012	.0013	.0012	.0012	.0013	.0013	.0013	.0013	.0012	.0012	.0013
				RPM	2000	1900	1800	1700	1610	1510	1420	1330	1270	1220	1160	1110	1050
				IPM(FEED)	10	9	9	9	8	8	7	7	7	6	6	6	5
	41	0.05D	1D	SFM(Vc)	185	185	185	185	185	185	180	175	175	175	180	175	175
				IPT(fz)	.0006	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005	.0005	.0005	.0005	.0005
				RPM	1370	1290	1210	1130	1060	990	920	850	820	780	750	710	680
				IPM(FEED)	3	3	3	3	2	2	2	2	2	2	2	1	1



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1	1	1	1	1	1	1	1	1.2	1.2	1.2	1.2
					LOC	3	4	5	6	7	8	10	12	4	6	8	10
P	1-8	Non-alloy steel	0.05D	2.5D	SFM(Vc)	200	200	200	180	180	180	180	160	200	200	180	180
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	19200	19200	19200	17280	17280	17280	17280	15360	16200	16200	14580	14580
					IPM(FEED)	7	7	7	6	6	5	5	4	8	8	7	6
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	115	115	115	100	100	100	100	90	115	115	105	105
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	10940	10940	10940	9850	9850	9850	9850	8760	9230	9230	8310	8310
					IPM(FEED)	3	3	3	2	2	2	2	2	3	3	3	2
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	200	200	200	180	180	180	180	160	200	200	180	180
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	19200	19200	19200	17280	17280	17280	17280	15360	16200	16200	14580	14580
					IPM(FEED)	7	7	7	6	6	5	5	4	8	8	7	6
	11.1-11.2		0.05D	2.5D	SFM(Vc)	115	115	115	100	100	100	100	90	115	115	105	105
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	10940	10940	10940	9850	9850	9850	9850	8760	9230	9230	8310	8310
					IPM(FEED)	3	3	3	2	2	2	2	2	3	3	3	2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	200	200	200	180	180	180	180	160	200	200	180	180
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	19200	19200	19200	17280	17280	17280	17280	15360	16200	16200	14580	14580
					IPM(FEED)	7	7	7	6	6	5	5	4	8	8	7	6
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	70	70	70	60	60	60	60	55	70	70	65	65
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0	.0	.0	.0001	.0001	.0001	.0001
					RPM	6720	6720	6720	6050	6050	6050	6050	5380	5670	5670	5100	5100
					IPM(FEED)	1	1	1	1	1	1	1	1	2	2	1	1
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	115	115	115	100	100	100	100	90	115	115	105	105
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
					RPM	10940	10940	10940	9850	9850	9850	9850	8760	9230	9230	8310	8310
					IPM(FEED)	3	3	3	2	2	2	2	2	3	3	3	2
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	70	70	70	60	60	60	60	55	70	70	65	65
					IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0	.0	.0	.0001	.0001	.0001	.0001
					RPM	6720	6720	6720	6050	6050	6050	6050	5380	5670	5670	5100	5100
					IPM(FEED)	1	1	1	1	1	1	1	1	2	2	1	1

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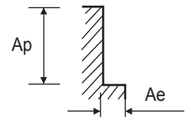

4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)												
					1.2	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2.5
				LOC	12	6	8	10	12	14	16	8	10	12	14	16	10
P	1-8	0.05D	2.5D	SFM(Vc)	180	215	190	190	190	190	170	220	220	195	195	195	230
				IPT(fz)	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003
				RPM	14580	13800	12420	12420	12420	12420	11040	10580	10580	9530	9530	9530	8990
				IPM(FEED)	6	9	8	7	6	6	5	9	9	8	8	7	10
	9	0.05D	2.5D	SFM(Vc)	105	120	110	110	110	110	95	125	125	110	110	110	135
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002
				RPM	8310	7870	7080	7080	7080	7080	6290	6050	6050	5440	5440	5440	5170
				IPM(FEED)	2	3	3	3	2	2	2	4	4	3	3	3	4
	10	0.05D	2.5D	SFM(Vc)	180	215	190	190	190	190	170	220	220	195	195	195	230
				IPT(fz)	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003
				RPM	14580	13800	12420	12420	12420	12420	11040	10580	10580	9530	9530	9530	8990
				IPM(FEED)	6	9	8	7	6	6	5	9	9	8	8	7	10
	11.1-11.2	0.05D	2.5D	SFM(Vc)	105	120	110	110	110	110	95	125	125	110	110	110	135
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002
				RPM	8310	7870	7080	7080	7080	7080	6290	6050	6050	5440	5440	5440	5170
				IPM(FEED)	2	3	3	3	2	2	2	4	4	3	3	3	4
K	15-20	0.05D	2.5D	SFM(Vc)	180	215	190	190	190	190	170	220	220	195	195	195	230
				IPT(fz)	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0003
				RPM	14580	13800	12420	12420	12420	12420	11040	10580	10580	9530	9530	9530	8990
				IPM(FEED)	6	9	8	7	6	6	5	9	9	8	8	7	10
H	38.1-38.2	0.02D	2.0D	SFM(Vc)	65	75	65	65	65	65	60	80	80	70	70	70	85
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002
				RPM	5100	4830	4350	4350	4350	4350	3860	3780	3780	3400	3400	3400	3210
				IPM(FEED)	1	2	2	1	1	1	1	2	2	2	2	2	2
	40	0.05D	2.5D	SFM(Vc)	105	120	110	110	110	110	95	125	125	110	110	110	135
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002
				RPM	8310	7870	7080	7080	7080	7080	6290	6050	6050	5440	5440	5440	5170
				IPM(FEED)	2	3	3	3	2	2	2	4	4	3	3	3	4
	41	0.02D	2.0D	SFM(Vc)	65	75	65	65	65	65	60	80	80	70	70	70	85
				IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0002
				RPM	5100	4830	4350	4350	4350	4350	3860	3780	3780	3400	3400	3400	3210
				IPM(FEED)	1	2	2	1	1	1	1	2	2	2	2	2	2

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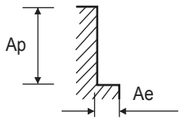

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						2.5	2.5	2.5	2.5	3	3	3	3	3	3	3	4
					LOC	12	16	20	26	10	12	14	16	20	26	30	12
P	1-8	Non-alloy steel	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	205	245
					IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0006
					RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000
					IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	135	120	120	105	130	130	130	120	120	120	120	140
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004
					RPM	5170	4650	4650	4130	4280	4280	4280	3860	3860	3860	3860	3410
					IPM(FEED)	4	3	3	2	5	5	5	4	4	3	3	6
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	205	245
					IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0006
					RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000
					IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13
	11.1-11.2		0.05D	2.5D	SFM(Vc)	135	120	120	105	130	130	130	120	120	120	120	140
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004
					RPM	5170	4650	4650	4130	4280	4280	4280	3860	3860	3860	3860	3410
					IPM(FEED)	4	3	3	2	5	5	5	4	4	3	3	6
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	230	210	210	185	230	230	230	205	205	205	205	245
					IPT(fz)	.0003	.0003	.0002	.0002	.0004	.0004	.0004	.0004	.0003	.0003	.0003	.0006
					RPM	8990	8090	8090	7200	7400	7400	7400	6660	6660	6660	6660	6000
					IPM(FEED)	10	8	7	6	11	11	11	10	9	8	8	13
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	85	75	75	65	80	80	80	75	75	75	75	90
					IPT(fz)	.0002	.0002	.0002	.0001	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0003
					RPM	3210	2890	2890	2570	2640	2640	2640	2380	2380	2380	2380	2150
					IPM(FEED)	2	2	2	1	3	3	3	2	2	2	2	3
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	135	120	120	105	130	130	130	120	120	120	120	140
					IPT(fz)	.0002	.0002	.0002	.0002	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0004
					RPM	5170	4650	4650	4130	4280	4280	4280	3860	3860	3860	3860	3410
					IPM(FEED)	4	3	3	2	5	5	5	4	4	3	3	6
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	85	75	75	65	80	80	80	75	75	75	75	90
					IPT(fz)	.0002	.0002	.0002	.0001	.0003	.0003	.0003	.0003	.0002	.0002	.0002	.0003
					RPM	3210	2890	2890	2570	2640	2640	2640	2380	2380	2380	2380	2150
					IPM(FEED)	2	2	2	1	3	3	3	2	2	2	2	3

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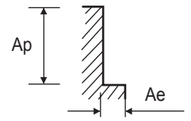

4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS
SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)											
					4	4	4	4	5	5	5	5	5	6	6	6	6
				LOC	16	20	26	30	20	25	30	35	40	15	20	25	30
P	1-8	0.05D	2.5D	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275	275
				IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012	.001
				RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	4420
				IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	17
	9	0.05D	2.5D	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155	155
				IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008	.0007
				RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520	2520
				IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9	7
	10	0.05D	2.5D	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275	275
				IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012	.001
				RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	4420
				IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	17
	11.1-11.2	0.05D	2.5D	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155	155
				IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008	.0007
				RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520	2520
				IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9	7
K	15-20	0.05D	2.5D	SFM(Vc)	245	245	225	225	265	265	240	240	240	275	275	275	275
				IPT(fz)	.0006	.0006	.0005	.0005	.0008	.0008	.0008	.0008	.0007	.0012	.0012	.0012	.001
				RPM	6000	6000	5400	5400	5120	5120	4610	4610	4610	4420	4420	4420	4420
				IPM(FEED)	13	13	11	11	17	17	14	14	12	20	20	20	17
H	38.1-38.2	0.02D	2.0D	SFM(Vc)	90	90	80	80	100	100	90	90	90	100	100	100	100
				IPT(fz)	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0007	.0007	.0007	.0005
				RPM	2150	2150	1930	1930	1900	1900	1710	1710	1710	1640	1640	1640	1640
				IPM(FEED)	3	3	2	2	3	3	3	3	2	4	4	4	4
	40	0.05D	2.5D	SFM(Vc)	140	140	125	125	150	150	135	135	135	155	155	155	155
				IPT(fz)	.0004	.0004	.0004	.0004	.0006	.0006	.0005	.0005	.0005	.0008	.0008	.0008	.0007
				RPM	3410	3410	3070	3070	2900	2900	2610	2610	2610	2520	2520	2520	2520
				IPM(FEED)	6	6	4	4	7	7	5	5	5	9	9	9	7
	41	0.02D	2.0D	SFM(Vc)	90	90	80	80	100	100	90	90	90	100	100	100	100
				IPT(fz)	.0003	.0003	.0003	.0003	.0004	.0004	.0004	.0004	.0004	.0007	.0007	.0007	.0005
				RPM	2150	2150	1930	1930	1900	1900	1710	1710	1710	1640	1640	1640	1640
				IPM(FEED)	3	3	2	2	3	3	3	3	2	4	4	4	4

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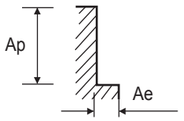

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						6	6	6	8	8	8	8	8	8	10	10	10
					LOC	35	40	45	25	30	35	40	45	50	30	35	40
P	1-8	Non-alloy steel	0.05D	2.5D	SFM(Vc)	245	245	245	275	275	275	275	250	250	290	290	290
					IPT(fz)	.001	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019
					RPM	3970	3970	3970	3360	3360	3360	3360	3020	3020	2820	2820	2820
					IPM(FEED)	16	14	14	22	22	22	19	17	15	22	22	22
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	140	140	140	155	155	155	155	140	140	170	170	170
					IPT(fz)	.0007	.0006	.0006	.0011	.0011	.0011	.001	.001	.0008	.0013	.0013	.0013
					RPM	2270	2270	2270	1900	1900	1900	1900	1710	1710	1640	1640	1640
					IPM(FEED)	7	6	6	9	9	9	7	7	6	9	9	9
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	245	245	245	275	275	275	275	250	250	290	290	290
					IPT(fz)	.001	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019
					RPM	3970	3970	3970	3360	3360	3360	3360	3020	3020	2820	2820	2820
					IPM(FEED)	16	14	14	22	22	22	19	17	15	22	22	22
	11.1-11.2		0.05D	2.5D	SFM(Vc)	140	140	140	155	155	155	155	140	140	170	170	170
					IPT(fz)	.0007	.0006	.0006	.0011	.0011	.0011	.001	.001	.0008	.0013	.0013	.0013
					RPM	2270	2270	2270	1900	1900	1900	1900	1710	1710	1640	1640	1640
					IPM(FEED)	7	6	6	9	9	9	7	7	6	9	9	9
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	245	245	245	275	275	275	275	250	250	290	290	290
					IPT(fz)	.001	.0009	.0009	.0016	.0016	.0016	.0014	.0014	.0012	.0019	.0019	.0019
					RPM	3970	3970	3970	3360	3360	3360	3360	3020	3020	2820	2820	2820
					IPM(FEED)	16	14	14	22	22	22	19	17	15	22	22	22
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	90	90	90	105	105	105	105	95	95	105	105	105
					IPT(fz)	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0007	.0007	.0011	.0011	.0011
					RPM	1480	1480	1480	1260	1260	1260	1260	1130	1130	1010	1010	1010
					IPM(FEED)	3	3	3	4	4	4	4	3	3	4	4	4
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	140	140	140	155	155	155	155	140	140	170	170	170
					IPT(fz)	.0007	.0006	.0006	.0011	.0011	.0011	.001	.001	.0008	.0013	.0013	.0013
					RPM	2270	2270	2270	1900	1900	1900	1900	1710	1710	1640	1640	1640
					IPM(FEED)	7	6	6	9	9	9	7	7	6	9	9	9
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	90	90	90	105	105	105	105	95	95	105	105	105
					IPT(fz)	.0006	.0005	.0005	.0009	.0009	.0009	.0007	.0007	.0007	.0011	.0011	.0011
					RPM	1480	1480	1480	1260	1260	1260	1260	1130	1130	1010	1010	1010
					IPM(FEED)	3	3	3	4	4	4	4	3	3	4	4	4

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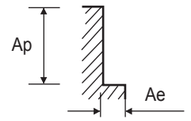

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)												
					10	10	10	10	12	12	12	12	12	12	12	12	14
				LOC	45	50	55	60	35	40	45	50	55	60	65	70	50
P	1-8	0.05D	2.5D	SFM(Vc)	290	290	260	260	285	285	285	285	285	285	255	255	305
				IPT(fz)	.0016	.0016	.0016	.0015	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0014	.0016
				RPM	2820	2820	2540	2540	2300	2300	2300	2300	2300	2300	2070	2070	2120
				IPM(FEED)	19	19	17	15	17	17	14	14	14	13	11	11	14
	9	0.05D	2.5D	SFM(Vc)	170	170	155	155	170	170	170	170	170	170	155	155	175
				IPT(fz)	.0011	.0011	.0011	.001	.0014	.0014	.0012	.0012	.0012	.001	.001	.001	.0012
				RPM	1640	1640	1480	1480	1390	1390	1390	1390	1390	1390	1250	1250	1230
				IPM(FEED)	7	7	7	6	8	8	7	7	7	6	5	5	6
	10	0.05D	2.5D	SFM(Vc)	290	290	260	260	285	285	285	285	285	285	255	255	305
				IPT(fz)	.0016	.0016	.0016	.0015	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0014	.0016
				RPM	2820	2820	2540	2540	2300	2300	2300	2300	2300	2300	2070	2070	2120
				IPM(FEED)	19	19	17	15	17	17	14	14	14	13	11	11	14
	11.1-11.2	0.05D	2.5D	SFM(Vc)	170	170	155	155	170	170	170	170	170	170	155	155	175
				IPT(fz)	.0011	.0011	.0011	.001	.0014	.0014	.0012	.0012	.0012	.001	.001	.001	.0012
				RPM	1640	1640	1480	1480	1390	1390	1390	1390	1390	1390	1250	1250	1230
				IPM(FEED)	7	7	7	6	8	8	7	7	7	6	5	5	6
K	15-20	0.05D	2.5D	SFM(Vc)	290	290	260	260	285	285	285	285	285	285	255	255	305
				IPT(fz)	.0016	.0016	.0016	.0015	.0018	.0018	.0016	.0016	.0016	.0014	.0014	.0014	.0016
				RPM	2820	2820	2540	2540	2300	2300	2300	2300	2300	2300	2070	2070	2120
				IPM(FEED)	19	19	17	15	17	17	14	14	14	13	11	11	14
H	38.1-38.2	0.02D	2.0D	SFM(Vc)	105	105	95	95	105	105	105	105	105	105	95	95	110
				IPT(fz)	.0009	.0009	.0009	.0008	.001	.001	.0008	.0008	.0008	.0008	.0007	.0007	.0009
				RPM	1010	1010	910	910	840	840	840	840	840	840	760	760	760
				IPM(FEED)	4	4	3	3	3	3	3	3	3	3	2	2	3
	40	0.05D	2.5D	SFM(Vc)	170	170	155	155	170	170	170	170	170	170	155	155	175
				IPT(fz)	.0011	.0011	.0011	.001	.0014	.0014	.0012	.0012	.0012	.001	.001	.001	.0012
				RPM	1640	1640	1480	1480	1390	1390	1390	1390	1390	1390	1250	1250	1230
				IPM(FEED)	7	7	7	6	8	8	7	7	7	6	5	5	6
	41	0.02D	2.0D	SFM(Vc)	105	105	95	95	105	105	105	105	105	105	95	95	110
				IPT(fz)	.0009	.0009	.0009	.0008	.001	.001	.0008	.0008	.0008	.0008	.0007	.0007	.0009
				RPM	1010	1010	910	910	840	840	840	840	840	840	760	760	760
				IPM(FEED)	4	4	3	3	3	3	3	3	3	3	2	2	3

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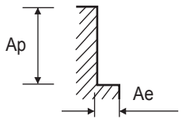

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						14	16	16	16	16	16	16	16	16	18	18	18
					LOC	60	40	50	60	70	80	90	110	120	50	70	100
P	1-8	Non-alloy steel	0.05D	2.5D	SFM(Vc)	305	320	320	320	320	320	290	290	290	310	310	280
					IPT(fz)	.0016	.002	.002	.0017	.0017	.0015	.0015	.0015	.0015	.0019	.0016	.0015
					RPM	2120	1940	1940	1940	1940	1940	1750	1750	1750	1680	1680	1510
					IPM(FEED)	14	15	15	13	13	11	10	10	10	13	11	9
	9	Low alloy steel	0.05D	2.5D	SFM(Vc)	175	175	175	175	175	175	160	160	160	175	175	160
					IPT(fz)	.0012	.0014	.0014	.0012	.0012	.0011	.001	.001	.001	.0014	.0011	.001
					RPM	1230	1070	1070	1070	1070	1070	960	960	960	940	940	850
					IPM(FEED)	6	6	6	5	5	5	4	4	4	5	4	3
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	305	320	320	320	320	320	290	290	290	310	310	280
					IPT(fz)	.0016	.002	.002	.0017	.0017	.0015	.0015	.0015	.0015	.0019	.0016	.0015
					RPM	2120	1940	1940	1940	1940	1940	1750	1750	1750	1680	1680	1510
					IPM(FEED)	14	15	15	13	13	11	10	10	10	13	11	9
	11.1-11.2		0.05D	2.5D	SFM(Vc)	175	175	175	175	175	175	160	160	160	175	175	160
					IPT(fz)	.0012	.0014	.0014	.0012	.0012	.0011	.001	.001	.001	.0014	.0011	.001
					RPM	1230	1070	1070	1070	1070	1070	960	960	960	940	940	850
					IPM(FEED)	6	6	6	5	5	5	4	4	4	5	4	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	305	320	320	320	320	320	290	290	290	310	310	280
					IPT(fz)	.0016	.002	.002	.0017	.0017	.0015	.0015	.0015	.0015	.0019	.0016	.0015
					RPM	2120	1940	1940	1940	1940	1940	1750	1750	1750	1680	1680	1510
					IPM(FEED)	14	15	15	13	13	11	10	10	10	13	11	9
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	110	110	110	110	110	110	100	100	100	110	110	100
					IPT(fz)	.0009	.001	.001	.0009	.0009	.0008	.0008	.0008	.0008	.0011	.0009	.0009
					RPM	760	670	670	670	670	670	600	600	600	590	590	530
					IPM(FEED)	3	3	3	2	2	2	2	2	2	3	2	2
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	175	175	175	175	175	175	160	160	160	175	175	160
					IPT(fz)	.0012	.0014	.0014	.0012	.0012	.0011	.001	.001	.001	.0014	.0011	.001
					RPM	1230	1070	1070	1070	1070	1070	960	960	960	940	940	850
					IPM(FEED)	6	6	6	5	5	5	4	4	4	5	4	3
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	110	110	110	110	110	110	100	100	100	110	110	100
					IPT(fz)	.0009	.001	.001	.0009	.0009	.0008	.0008	.0008	.0008	.0011	.0009	.0009
					RPM	760	670	670	670	670	670	600	600	600	590	590	530
					IPM(FEED)	3	3	3	2	2	2	2	2	2	3	2	2

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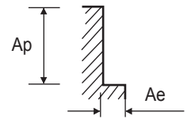
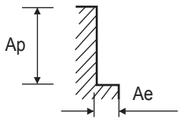


4G MILL END MILLS
RECOMMENDED CUTTING CONDITIONS

SEME72 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)												
					20	20	20	20	20	20	20	22	22	25	25	25	25
				LOC	50	60	70	80	90	110	120	75	110	70	90	110	120
P	1-8	0.05D	2.5D	SFM(Vc)	295	295	295	295	295	260	260	285	285	285	285	285	285
				IPT(fz)	.0019	.0019	.0016	.0016	.0014	.0014	.0014	.0016	.0014	.0019	.0017	.0017	.0014
				RPM	1420	1420	1420	1420	1420	1270	1270	1260	1260	1100	1100	1100	1100
				IPM(FEED)	11	11	9	9	8	7	7	8	7	9	7	7	6
	9	0.05D	2.5D	SFM(Vc)	170	170	170	170	170	150	150	185	185	210	210	210	210
				IPT(fz)	.0013	.0013	.0011	.0011	.001	.001	.001	.0011	.001	.0013	.0011	.0011	.001
				RPM	820	820	820	820	820	730	730	820	820	820	820	820	820
				IPM(FEED)	4	4	4	4	3	3	3	4	3	4	4	4	3
	10	0.05D	2.5D	SFM(Vc)	295	295	295	295	295	260	260	285	285	285	285	285	285
				IPT(fz)	.0019	.0019	.0016	.0016	.0014	.0014	.0014	.0016	.0014	.0019	.0017	.0017	.0014
				RPM	1420	1420	1420	1420	1420	1270	1270	1260	1260	1100	1100	1100	1100
				IPM(FEED)	11	11	9	9	8	7	7	8	7	9	7	7	6
	11.1-11.2	0.05D	2.5D	SFM(Vc)	170	170	170	170	170	150	150	185	185	210	210	210	210
				IPT(fz)	.0013	.0013	.0011	.0011	.001	.001	.001	.0011	.001	.0013	.0011	.0011	.001
				RPM	820	820	820	820	820	730	730	820	820	820	820	820	820
				IPM(FEED)	4	4	4	4	3	3	3	4	3	4	4	4	3
K	15-20	0.05D	2.5D	SFM(Vc)	295	295	295	295	295	260	260	285	285	285	285	285	285
				IPT(fz)	.0019	.0019	.0016	.0016	.0014	.0014	.0014	.0016	.0014	.0019	.0017	.0017	.0014
				RPM	1420	1420	1420	1420	1420	1270	1270	1260	1260	1100	1100	1100	1100
				IPM(FEED)	11	11	9	9	8	7	7	8	7	9	7	7	6
H	38.1-38.2	0.02D	2.0D	SFM(Vc)	105	105	105	105	105	95	95	115	115	130	130	130	130
				IPT(fz)	.0011	.0011	.0009	.0009	.0008	.0008	.0008	.0009	.0008	.0011	.0009	.0009	.0008
				RPM	500	500	500	500	500	450	450	500	500	500	500	500	500
				IPM(FEED)	2	2	2	2	2	1	1	2	2	2	2	2	2
	40	0.05D	2.5D	SFM(Vc)	170	170	170	170	170	150	150	185	185	210	210	210	210
				IPT(fz)	.0013	.0013	.0011	.0011	.001	.001	.001	.0011	.001	.0013	.0011	.0011	.001
				RPM	820	820	820	820	820	730	730	820	820	820	820	820	820
				IPM(FEED)	4	4	4	4	3	3	3	4	3	4	4	4	3
	41	0.02D	2.0D	SFM(Vc)	105	105	105	105	105	95	95	115	115	130	130	130	130
				IPT(fz)	.0011	.0011	.0009	.0009	.0008	.0008	.0008	.0009	.0008	.0011	.0009	.0009	.0008
				RPM	500	500	500	500	500	450	450	500	500	500	500	500	500
				IPM(FEED)	2	2	2	2	2	1	1	2	2	2	2	2	2



4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				1	1	1	1	1	1	1	1	1	1	1	1
			LBS	2	3	4	5	6	7	8	10	12	14	16	18
P	1-8	Non-alloy steel	SFM(Vc)	225	225	225	225	205	205	205	205	180	180	135	135
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	22000	22000	22000	22000	19800	19800	19800	19800	17600	17600	13200	13200
			IPM(FEED)	12	12	12	12	10	10	10	10	8	8	5	5
			Ae	.0008	.0008	.0006	.0006	.0003	.0003	.0003	.0002	.0002	.0001	.0001	.0001
	9	Low alloy steel	SFM(Vc)	140	140	140	140	125	125	125	125	110	110	85	85
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	13500	13500	13500	13500	12150	12150	12150	12150	10800	10800	8100	8100
			IPM(FEED)	7	7	7	7	6	6	6	6	5	5	3	3
			Ae	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001
	10	High alloyed steel, and tool steel	SFM(Vc)	225	225	225	225	205	205	205	205	180	180	135	135
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	22000	22000	22000	22000	19800	19800	19800	19800	17600	17600	13200	13200
			IPM(FEED)	12	12	12	12	10	10	10	10	8	8	5	5
			Ae	.0008	.0008	.0006	.0006	.0003	.0003	.0003	.0002	.0002	.0001	.0001	.0001
	11.1-11.2		SFM(Vc)	140	140	140	140	125	125	125	125	110	110	85	85
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	13500	13500	13500	13500	12150	12150	12150	12150	10800	10800	8100	8100
			IPM(FEED)	7	7	7	7	6	6	6	6	5	5	3	3
			Ae	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	225	225	225	225	205	205	205	205	180	180	135	135
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	22000	22000	22000	22000	19800	19800	19800	19800	17600	17600	13200	13200
			IPM(FEED)	12	12	12	12	10	10	10	10	8	8	5	5
			Ae	.0008	.0008	.0006	.0006	.0003	.0003	.0003	.0002	.0002	.0001	.0001	.0001
H	38.1-38.2	Hardened steel	SFM(Vc)	90	90	90	90	80	80	80	80	70	70	55	55
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.00004	.00004	.00004	.00004
			RPM	8500	8500	8500	8500	7650	7650	7650	7650	6800	6800	5100	5100
			IPM(FEED)	2	2	2	2	1.6	1.6	1.6	1.6	1.2	1.2	0.8	0.8
			Ae	.0005	.0005	.0004	.0004	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0000
	40	Chilled Cast Iron	SFM(Vc)	140	140	140	140	125	125	125	125	110	110	85	85
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	13500	13500	13500	13500	12150	12150	12150	12150	10800	10800	8100	8100
			IPM(FEED)	7	7	7	7	6	6	6	6	5	5	3	3
			Ae	.0006	.0006	.0004	.0004	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001
	41	Hardened Cast Iron	SFM(Vc)	90	90	90	90	80	80	80	80	70	70	55	55
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.00004	.00004	.00004	.00004
			RPM	8500	8500	8500	8500	7650	7650	7650	7650	6800	6800	5100	5100
			IPM(FEED)	2	2	2	2	1.6	1.6	1.6	1.6	1.2	1.2	0.8	0.8
			Ae	.0005	.0005	.0004	.0004	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0000

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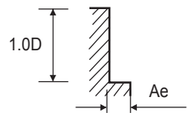

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)											
			1	1	1	1	1	1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		LBS	20	22	26	30	40	50	4	6	8	10	12	14	16
P	1-8	SFM(Vc)	135	70	70	70	25	25	240	240	215	215	215	195	195
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001
		RPM	13200	6600	6600	6600	2200	2200	19500	19500	17550	17550	17550	15600	15600
		IPM(FEED)	5	2	2	2	1	1	12	12	10	10	10	8	8
		Ae	.0001	.0001	.0001	.0001	.0001	.0001	.0007	.0007	.0004	.0002	.0002	.0002	.0002
	9	SFM(Vc)	85	40	40	40	15	15	150	150	135	135	135	120	120
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001
		RPM	8100	4050	4050	4050	1350	1350	12100	12100	10890	10890	10890	9680	9680
		IPM(FEED)	3	1	1	1	0	0	7	7	6	6	6	5	5
		Ae	.0001	.0001	.0001	.0001	.0001	.0001	.0005	.0005	.0003	.0002	.0002	.0002	.0001
	10	SFM(Vc)	135	70	70	70	25	25	240	240	215	215	215	195	195
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001
		RPM	13200	6600	6600	6600	2200	2200	19500	19500	17550	17550	17550	15600	15600
		IPM(FEED)	5	2	2	2	1	1	12	12	10	10	10	8	8
		Ae	.0001	.0001	.0001	.0001	.0001	.0001	.0007	.0007	.0004	.0002	.0002	.0002	.0002
	11.1-11.2	SFM(Vc)	85	40	40	40	15	15	150	150	135	135	135	120	120
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001
		RPM	8100	4050	4050	4050	1350	1350	12100	12100	10890	10890	10890	9680	9680
		IPM(FEED)	3	1	1	1	0	0	7	7	6	6	6	5	5
		Ae	.0001	.0001	.0001	.0001	.0001	.0001	.0005	.0005	.0003	.0002	.0002	.0002	.0001
K	15-20	SFM(Vc)	135	70	70	70	25	25	240	240	215	215	215	195	195
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001
		RPM	13200	6600	6600	6600	2200	2200	19500	19500	17550	17550	17550	15600	15600
		IPM(FEED)	5	2	2	2	1	1	12	12	10	10	10	8	8
		Ae	.0001	.0001	.0001	.0001	.0001	.0001	.0007	.0007	.0004	.0002	.0002	.0002	.0002
H	38.1-38.2	SFM(Vc)	55	25	25	25	10	10	95	95	85	85	85	75	75
		IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	5100	2550	2550	2550	850	850	7500	7500	6750	6750	6750	6000	6000
		IPM(FEED)	0.8	0.4	0.4	0.4	0.2	0.2	2	2	1.6	1.6	1.6	1.2	1.2
		Ae	.0000	.0000	.0000	.0000	.0000	.0000	.0004	.0004	.0002	.0002	.0002	.0002	.0001
	40	SFM(Vc)	85	40	40	40	15	15	150	150	135	135	135	120	120
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0001	.0001	.0001	.0001	.0001
		RPM	8100	4050	4050	4050	1350	1350	12100	12100	10890	10890	10890	9680	9680
		IPM(FEED)	3	1	1	1	0	0	7	7	6	6	6	5	5
		Ae	.0001	.0001	.0001	.0001	.0001	.0001	.0005	.0005	.0003	.0002	.0002	.0002	.0001
	41	SFM(Vc)	55	25	25	25	10	10	95	95	85	85	85	75	75
		IPT(fz)	.00004	.00004	.00004	.00004	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	5100	2550	2550	2550	850	850	7500	7500	6750	6750	6750	6000	6000
		IPM(FEED)	0.8	0.4	0.4	0.4	0.2	0.2	2	2	1.6	1.6	1.6	1.2	1.2
		Ae	.0000	.0000	.0000	.0000	.0000	.0000	.0004	.0004	.0002	.0002	.0002	.0002	.0001

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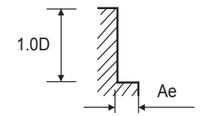

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)												
				1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
			LBS	20	26	30	4	5	6	7	8	10	12	14	16	
P	1-8	Non-alloy steel	SFM(Vc)	145	70	70	265	265	265	265	235	235	235	235	210	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	
			RPM	11700	5850	5850	17000	17000	17000	17000	15300	15300	15300	15300	13600	
			IPM(FEED)	5	2	2	13	13	13	13	10	10	10	10	8	
			Ae	.0001	.0001	.0001	.0013	.0009	.0009	.0009	.0005	.0005	.0005	.0003	.0003	
	9	Low alloy steel	SFM(Vc)	90	45	45	165	165	165	165	150	150	150	150	130	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	
			RPM	7260	3630	3630	10700	10700	10700	10700	9630	9630	9630	9630	8560	
			IPM(FEED)	3	1	1	8	8	8	8	6	6	6	6	5	
			Ae	.0001	.0001	.0001	.0009	.0007	.0007	.0007	.0004	.0004	.0004	.0002	.0002	
	10	High alloyed steel, and tool steel	SFM(Vc)	145	70	70	265	265	265	265	235	235	235	235	210	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	
			RPM	11700	5850	5850	17000	17000	17000	17000	15300	15300	15300	15300	13600	
			IPM(FEED)	5	2	2	13	13	13	13	10	10	10	10	8	
			Ae	.0001	.0001	.0001	.0013	.0009	.0009	.0009	.0005	.0005	.0005	.0003	.0003	
	11.1-11.2		SFM(Vc)	90	45	45	165	165	165	165	150	150	150	150	130	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	
			RPM	7260	3630	3630	10700	10700	10700	10700	9630	9630	9630	9630	8560	
			IPM(FEED)	3	1	1	8	8	8	8	6	6	6	6	5	
			Ae	.0001	.0001	.0001	.0009	.0007	.0007	.0007	.0004	.0004	.0004	.0002	.0002	
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	145	70	70	265	265	265	265	235	235	235	235	210	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	
			RPM	11700	5850	5850	17000	17000	17000	17000	15300	15300	15300	15300	13600	
			IPM(FEED)	5	2	2	13	13	13	13	10	10	10	10	8	
			Ae	.0001	.0001	.0001	.0013	.0009	.0009	.0009	.0005	.0005	.0005	.0003	.0003	
H	38.1-38.2	Hardened steel	SFM(Vc)	55	30	30	100	100	100	100	90	90	90	90	80	
			IPT(fz)	-	-	-	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	
			RPM	4500	2250	2250	6500	6500	6500	6500	5850	5850	5850	5850	5200	
			IPM(FEED)	0.8	0.4	0.4	2	2	2	2	1.6	1.6	1.6	1.6	1.2	
			Ae	.0001	.0001	.0001	.0007	.0005	.0005	.0005	.0003	.0003	.0003	.0002	.0002	
	40	Chilled Cast Iron	SFM(Vc)	90	45	45	165	165	165	165	150	150	150	150	130	
			IPT(fz)	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	
			RPM	7260	3630	3630	10700	10700	10700	10700	9630	9630	9630	9630	8560	
			IPM(FEED)	3	1	1	8	8	8	8	6	6	6	6	5	
			Ae	.0001	.0001	.0001	.0009	.0007	.0007	.0007	.0004	.0004	.0004	.0002	.0002	
	41	Hardened Cast Iron	SFM(Vc)	55	30	30	100	100	100	100	90	90	90	90	80	
			IPT(fz)	-	-	-	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	
			RPM	4500	2250	2250	6500	6500	6500	6500	5850	5850	5850	5850	5200	
			IPM(FEED)	0.8	0.4	0.4	2	2	2	2	1.6	1.6	1.6	1.6	1.2	
			Ae	.0001	.0001	.0001	.0007	.0005	.0005	.0005	.0003	.0003	.0003	.0002	.0002	

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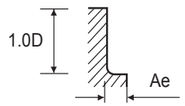

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)												
			1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2	2	2
		LBS	18	20	22	26	30	6	8	10	12	16	18	20	22
P	1-8	SFM(Vc)	210	210	210	160	160	285	285	285	260	260	260	260	230
		IPT(fz)	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	13600	13600	13600	10200	10200	13900	13900	13900	12510	12510	12510	12510	11120
		IPM(FEED)	8	8	8	5	5	13	13	13	10	10	10	10	8
		Ae	.0003	.0002	.0002	.0001	.0001	.0017	.0011	.0011	.0007	.0007	.0004	.0004	.0004
	9	SFM(Vc)	130	130	130	100	100	185	185	185	170	170	170	170	150
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	8560	8560	8560	6420	6420	9070	9070	9070	8160	8160	8160	8160	7260
		IPM(FEED)	5	5	5	3	3	8	8	8	6	6	6	6	5
		Ae	.0002	.0002	.0002	.0001	.0001	.0013	.0009	.0009	.0005	.0005	.0003	.0003	.0003
	10	SFM(Vc)	210	210	210	160	160	285	285	285	260	260	260	260	230
		IPT(fz)	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	13600	13600	13600	10200	10200	13900	13900	13900	12510	12510	12510	12510	11120
		IPM(FEED)	8	8	8	5	5	13	13	13	10	10	10	10	8
		Ae	.0003	.0002	.0002	.0001	.0001	.0017	.0011	.0011	.0007	.0007	.0004	.0004	.0004
	11.1-11.2	SFM(Vc)	130	130	130	100	100	185	185	185	170	170	170	170	150
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	8560	8560	8560	6420	6420	9070	9070	9070	8160	8160	8160	8160	7260
		IPM(FEED)	5	5	5	3	3	8	8	8	6	6	6	6	5
		Ae	.0002	.0002	.0002	.0001	.0001	.0013	.0009	.0009	.0005	.0005	.0003	.0003	.0003
K	15-20	SFM(Vc)	210	210	210	160	160	285	285	285	260	260	260	260	230
		IPT(fz)	.0002	.0002	.0002	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	13600	13600	13600	10200	10200	13900	13900	13900	12510	12510	12510	12510	11120
		IPM(FEED)	8	8	8	5	5	13	13	13	10	10	10	10	8
		Ae	.0003	.0002	.0002	.0001	.0001	.0017	.0011	.0011	.0007	.0007	.0004	.0004	.0004
H	38.1-38.2	SFM(Vc)	80	80	80	60	60	125	125	125	110	110	110	110	100
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	5200	5200	5200	3900	3900	6000	6000	6000	5400	5400	5400	5400	4800
		IPM(FEED)	1.2	1.2	1.2	0.8	0.8	2.4	2.4	2.4	2	2	2	2	1.6
		Ae	.0002	.0001	.0001	.0001	.0001	.0010	.0007	.0007	.0004	.0004	.0002	.0002	.0002
	40	SFM(Vc)	130	130	130	100	100	185	185	185	170	170	170	170	150
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	8560	8560	8560	6420	6420	9070	9070	9070	8160	8160	8160	8160	7260
		IPM(FEED)	5	5	5	3	3	8	8	8	6	6	6	6	5
		Ae	.0002	.0002	.0002	.0001	.0001	.0013	.0009	.0009	.0005	.0005	.0003	.0003	.0003
	41	SFM(Vc)	80	80	80	60	60	125	125	125	110	110	110	110	100
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
		RPM	5200	5200	5200	3900	3900	6000	6000	6000	5400	5400	5400	5400	4800
		IPM(FEED)	1.2	1.2	1.2	0.8	0.8	2.4	2.4	2.4	2	2	2	2	1.6
		Ae	.0002	.0001	.0001	.0001	.0001	.0010	.0007	.0007	.0004	.0004	.0002	.0002	.0002

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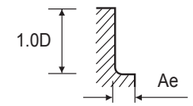

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				2	2	2	2	2	2	2	2.5	2.5	2.5	2.5	2.5
			LBS	26	30	35	40	45	50	60	8	10	12	14	16
P	1-8	Non-alloy steel	SFM(Vc)	230	230	170	170	85	85	85	310	310	310	280	280
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003
			RPM	11120	11120	8340	8340	4170	4170	4170	12000	12000	12000	10800	10800
			IPM(FEED)	8	8	6	6	2	2	2	14	14	14	11	11
			Ae	.0004	.0002	.0002	.0002	.0002	.0002	.0002	.0015	.0015	.0015	.0008	.0008
	9	Low alloy steel	SFM(Vc)	150	150	110	110	55	55	55	195	195	195	175	175
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003
			RPM	7260	7260	5440	5440	2720	2720	2720	7600	7600	7600	6840	6840
			IPM(FEED)	5	5	3	3	1	1	1	9	9	9	7	7
			Ae	.0003	.0002	.0001	.0001	.0001	.0001	.0001	.0011	.0011	.0011	.0006	.0006
	10	High alloyed steel, and tool steel	SFM(Vc)	230	230	170	170	85	85	85	310	310	310	280	280
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003
			RPM	11120	11120	8340	8340	4170	4170	4170	12000	12000	12000	10800	10800
			IPM(FEED)	8	8	6	6	2	2	2	14	14	14	11	11
			Ae	.0004	.0002	.0002	.0002	.0002	.0002	.0002	.0015	.0015	.0015	.0008	.0008
	11.1-11.2		SFM(Vc)	150	150	110	110	55	55	55	195	195	195	175	175
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003
			RPM	7260	7260	5440	5440	2720	2720	2720	7600	7600	7600	6840	6840
			IPM(FEED)	5	5	3	3	1	1	1	9	9	9	7	7
			Ae	.0003	.0002	.0001	.0001	.0001	.0001	.0001	.0011	.0011	.0011	.0006	.0006
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	230	230	170	170	85	85	85	310	310	310	280	280
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003
			RPM	11120	11120	8340	8340	4170	4170	4170	12000	12000	12000	10800	10800
			IPM(FEED)	8	8	6	6	2	2	2	14	14	14	11	11
			Ae	.0004	.0002	.0002	.0002	.0002	.0002	.0002	.0015	.0015	.0015	.0008	.0008
H	38.1-38.2	Hardened steel	SFM(Vc)	100	100	75	75	35	35	35	115	115	115	105	105
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	4800	4800	3600	3600	1800	1800	1800	4500	4500	4500	4050	4050
			IPM(FEED)	1.6	1.6	1	1	0.4	0.4	0.4	2.4	2.4	2.4	2	2
			Ae	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0009	.0009	.0009	.0005	.0005
	40	Chilled Cast Iron	SFM(Vc)	150	150	110	110	55	55	55	195	195	195	175	175
			IPT(fz)	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0003	.0003	.0003	.0003	.0003
			RPM	7260	7260	5440	5440	2720	2720	2720	7600	7600	7600	6840	6840
			IPM(FEED)	5	5	3	3	1	1	1	9	9	9	7	7
			Ae	.0003	.0002	.0001	.0001	.0001	.0001	.0001	.0011	.0011	.0011	.0006	.0006
	41	Hardened Cast Iron	SFM(Vc)	100	100	75	75	35	35	35	115	115	115	105	105
			IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
			RPM	4800	4800	3600	3600	1800	1800	1800	4500	4500	4500	4050	4050
			IPM(FEED)	1.6	1.6	1	1	0.4	0.4	0.4	2.4	2.4	2.4	2	2
			Ae	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0009	.0009	.0009	.0005	.0005

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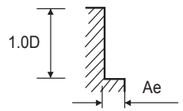

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)											
			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3
		LBS	18	20	22	26	30	35	40	45	50	6	8	10	12
P	1-8	SFM(Vc)	280	280	280	245	245	245	185	185	185	330	330	330	330
		IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	10800	10800	10800	9600	9600	9600	7200	7200	7200	10700	10700	10700	10700
		IPM(FEED)	11	11	11	9	9	9	6	6	6	15	15	15	15
		Ae	.0008	.0008	.0005	.0005	.0005	.0003	.0003	.0002	.0002	.0025	.0025	.0017	.0017
	9	SFM(Vc)	175	175	175	155	155	155	115	115	115	205	205	205	205
		IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	6840	6840	6840	6080	6080	6080	4560	4560	4560	6670	6670	6670	6670
		IPM(FEED)	7	7	7	6	6	6	4	4	4	9	9	9	9
		Ae	.0006	.0006	.0004	.0004	.0004	.0002	.0002	.0002	.0002	.0019	.0019	.0013	.0013
	10	SFM(Vc)	280	280	280	245	245	245	185	185	185	330	330	330	330
		IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	10800	10800	10800	9600	9600	9600	7200	7200	7200	10700	10700	10700	10700
		IPM(FEED)	11	11	11	9	9	9	6	6	6	15	15	15	15
		Ae	.0008	.0008	.0005	.0005	.0005	.0003	.0003	.0002	.0002	.0025	.0025	.0017	.0017
	11.1-11.2	SFM(Vc)	175	175	175	155	155	155	115	115	115	205	205	205	205
		IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	6840	6840	6840	6080	6080	6080	4560	4560	4560	6670	6670	6670	6670
		IPM(FEED)	7	7	7	6	6	6	4	4	4	9	9	9	9
		Ae	.0006	.0006	.0004	.0004	.0004	.0002	.0002	.0002	.0002	.0019	.0019	.0013	.0013
K	15-20	SFM(Vc)	280	280	280	245	245	245	185	185	185	330	330	330	330
		IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	10800	10800	10800	9600	9600	9600	7200	7200	7200	10700	10700	10700	10700
		IPM(FEED)	11	11	11	9	9	9	6	6	6	15	15	15	15
		Ae	.0008	.0008	.0005	.0005	.0005	.0003	.0003	.0002	.0002	.0025	.0025	.0017	.0017
H	38.1-38.2	SFM(Vc)	105	105	105	95	95	95	70	70	70	125	125	125	125
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
		RPM	4050	4050	4050	3600	3600	3600	2700	2700	2700	4030	4030	4030	4030
		IPM(FEED)	2	2	2	1.6	1.6	1.6	1	1	1	2.8	2.8	2.8	2.8
		Ae	.0005	.0005	.0003	.0003	.0003	.0002	.0002	.0001	.0001	.0015	.0015	.0010	.0010
	40	SFM(Vc)	175	175	175	155	155	155	115	115	115	205	205	205	205
		IPT(fz)	.0003	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0004	.0004	.0004	.0004
		RPM	6840	6840	6840	6080	6080	6080	4560	4560	4560	6670	6670	6670	6670
		IPM(FEED)	7	7	7	6	6	6	4	4	4	9	9	9	9
		Ae	.0006	.0006	.0004	.0004	.0004	.0002	.0002	.0002	.0002	.0019	.0019	.0013	.0013
	41	SFM(Vc)	105	105	105	95	95	95	70	70	70	125	125	125	125
		IPT(fz)	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002
		RPM	4050	4050	4050	3600	3600	3600	2700	2700	2700	4030	4030	4030	4030
		IPM(FEED)	2	2	2	1.6	1.6	1.6	1	1	1	2.8	2.8	2.8	2.8
		Ae	.0005	.0005	.0003	.0003	.0003	.0002	.0002	.0001	.0001	.0015	.0015	.0010	.0010

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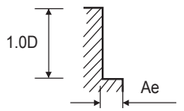

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				3	3	3	3	3	3	3	3	3	3	3	3
			LBS	14	16	18	20	22	26	30	35	40	45	50	60
P	1-8	Non-alloy steel	SFM(Vc)	330	300	300	300	300	300	300	265	265	265	200	200
			IPT(fz)	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	10700	9630	9630	9630	9630	9630	9630	8560	8560	8560	6420	6420
			IPM(FEED)	15	12	12	12	12	12	12	10	10	10	6	6
			Ae	.0017	.0010	.0010	.0010	.0010	.0006	.0006	.0006	.0004	.0004	.0002	.0002
	9	Low alloy steel	SFM(Vc)	205	185	185	185	185	185	185	165	165	165	125	125
			IPT(fz)	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	6670	6000	6000	6000	6000	6000	6000	5340	5340	5340	4000	4000
			IPM(FEED)	9	8	8	8	8	8	8	6	6	6	4	4
			Ae	.0013	.0007	.0007	.0007	.0007	.0005	.0005	.0005	.0003	.0003	.0002	.0002
	10	High alloyed steel, and tool steel	SFM(Vc)	330	300	300	300	300	300	300	265	265	265	200	200
			IPT(fz)	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	10700	9630	9630	9630	9630	9630	9630	8560	8560	8560	6420	6420
			IPM(FEED)	15	12	12	12	12	12	12	10	10	10	6	6
			Ae	.0017	.0010	.0010	.0010	.0010	.0006	.0006	.0006	.0004	.0004	.0002	.0002
	11.1-11.2		SFM(Vc)	205	185	185	185	185	185	185	165	165	165	125	125
			IPT(fz)	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	6670	6000	6000	6000	6000	6000	6000	5340	5340	5340	4000	4000
			IPM(FEED)	9	8	8	8	8	8	8	6	6	6	4	4
			Ae	.0013	.0007	.0007	.0007	.0007	.0005	.0005	.0005	.0003	.0003	.0002	.0002
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	330	300	300	300	300	300	300	265	265	265	200	200
			IPT(fz)	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003
			RPM	10700	9630	9630	9630	9630	9630	9630	8560	8560	8560	6420	6420
			IPM(FEED)	15	12	12	12	12	12	12	10	10	10	6	6
			Ae	.0017	.0010	.0010	.0010	.0010	.0006	.0006	.0006	.0004	.0004	.0002	.0002
H	38.1-38.2	Hardened steel	SFM(Vc)	125	110	110	110	110	110	110	100	100	100	75	75
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001
			RPM	4030	3630	3630	3630	3630	3630	3630	3220	3220	3220	2420	2420
			IPM(FEED)	2.8	2.2	2.2	2.2	2.2	2.2	2.2	1.8	1.8	1.8	1.2	1.2
			Ae	.0010	.0006	.0006	.0006	.0006	.0004	.0004	.0004	.0002	.0002	.0002	.0002
	40	Chilled Cast Iron	SFM(Vc)	205	185	185	185	185	185	185	165	165	165	125	125
			IPT(fz)	.0004	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002	.0002
			RPM	6670	6000	6000	6000	6000	6000	6000	5340	5340	5340	4000	4000
			IPM(FEED)	9	8	8	8	8	8	8	6	6	6	4	4
			Ae	.0013	.0007	.0007	.0007	.0007	.0005	.0005	.0005	.0003	.0003	.0002	.0002
	41	Hardened Cast Iron	SFM(Vc)	125	110	110	110	110	110	110	100	100	100	75	75
			IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001	.0001	.0001	.0001
			RPM	4030	3630	3630	3630	3630	3630	3630	3220	3220	3220	2420	2420
			IPM(FEED)	2.8	2.2	2.2	2.2	2.2	2.2	2.2	1.8	1.8	1.8	1.2	1.2
			Ae	.0010	.0006	.0006	.0006	.0006	.0004	.0004	.0004	.0002	.0002	.0002	.0002

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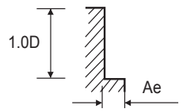

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)												
			4	4	4	4	4	4	4	4	4	4	4	4	4
		LBS	8	10	12	14	16	18	20	22	26	30	35	40	45
P	1-8	SFM(Vc)	375	375	375	375	375	375	375	335	335	335	335	335	300
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006
		RPM	9070	9070	9070	9070	9070	9070	9070	8160	8160	8160	8160	8160	7260
		IPM(FEED)	27	27	27	27	27	27	27	22	22	22	22	22	17
		Ae	.0033	.0033	.0033	.0023	.0023	.0023	.0023	.0013	.0013	.0013	.0008	.0008	.0008
	9	SFM(Vc)	230	230	230	230	230	230	230	205	205	205	205	205	185
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006
		RPM	5540	5540	5540	5540	5540	5540	5540	4990	4990	4990	4990	4990	4430
		IPM(FEED)	17	17	17	17	17	17	17	13	13	13	13	13	11
		Ae	.0025	.0025	.0025	.0017	.0017	.0017	.0017	.0010	.0010	.0010	.0006	.0006	.0006
	10	SFM(Vc)	375	375	375	375	375	375	375	335	335	335	335	335	300
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006
		RPM	9070	9070	9070	9070	9070	9070	9070	8160	8160	8160	8160	8160	7260
		IPM(FEED)	27	27	27	27	27	27	27	22	22	22	22	22	17
		Ae	.0033	.0033	.0033	.0023	.0023	.0023	.0023	.0013	.0013	.0013	.0008	.0008	.0008
	11.1-11.2	SFM(Vc)	230	230	230	230	230	230	230	205	205	205	205	205	185
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006
		RPM	5540	5540	5540	5540	5540	5540	5540	4990	4990	4990	4990	4990	4430
		IPM(FEED)	17	17	17	17	17	17	17	13	13	13	13	13	11
		Ae	.0025	.0025	.0025	.0017	.0017	.0017	.0017	.0010	.0010	.0010	.0006	.0006	.0006
K	15-20	SFM(Vc)	375	375	375	375	375	375	375	335	335	335	335	335	300
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006
		RPM	9070	9070	9070	9070	9070	9070	9070	8160	8160	8160	8160	8160	7260
		IPM(FEED)	27	27	27	27	27	27	27	22	22	22	22	22	17
		Ae	.0033	.0033	.0033	.0023	.0023	.0023	.0023	.0013	.0013	.0013	.0008	.0008	.0008
H	38.1-38.2	SFM(Vc)	145	145	145	145	145	145	145	130	130	130	130	130	115
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	3530	3530	3530	3530	3530	3530	3530	3180	3180	3180	3180	3180	2820
		IPM(FEED)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.2	2.2	2.2	2.2	2.2	1.8
		Ae	.0020	.0020	.0020	.0014	.0014	.0014	.0014	.0008	.0008	.0008	.0005	.0005	.0005
	40	SFM(Vc)	230	230	230	230	230	230	230	205	205	205	205	205	185
		IPT(fz)	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0007	.0006
		RPM	5540	5540	5540	5540	5540	5540	5540	4990	4990	4990	4990	4990	4430
		IPM(FEED)	17	17	17	17	17	17	17	13	13	13	13	13	11
		Ae	.0025	.0025	.0025	.0017	.0017	.0017	.0017	.0010	.0010	.0010	.0006	.0006	.0006
	41	SFM(Vc)	145	145	145	145	145	145	145	130	130	130	130	130	115
		IPT(fz)	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
		RPM	3530	3530	3530	3530	3530	3530	3530	3180	3180	3180	3180	3180	2820
		IPM(FEED)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.2	2.2	2.2	2.2	2.2	1.8
		Ae	.0020	.0020	.0020	.0014	.0014	.0014	.0014	.0008	.0008	.0008	.0005	.0005	.0005

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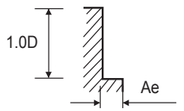

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)											
				4	4	5	5	5	5	5	5	5	5	6	6
			LBS	50	60	16	20	26	30	35	40	50	60	15	20
P	1-8	Non-alloy steel	SFM(Vc)	300	300	390	390	350	350	350	350	350	310	410	410
			IPT(fz)	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0008	.0012	.0012
			RPM	7260	7260	7560	7560	6800	6800	6800	6800	6800	6050	6670	6670
			IPM(FEED)	17	17	28	28	23	23	23	23	23	18	31	31
			Ae	.0008	.0005	.0029	.0029	.0017	.0017	.0017	.0017	.0010	.0010	.0050	.0035
	9	Low alloy steel	SFM(Vc)	185	185	235	235	210	210	210	210	210	185	250	250
			IPT(fz)	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0008	.0012	.0012
			RPM	4430	4430	4530	4530	4080	4080	4080	4080	4080	3620	4030	4030
			IPM(FEED)	11	11	17	17	14	14	14	14	14	11	19	19
			Ae	.0006	.0004	.0022	.0022	.0013	.0013	.0013	.0013	.0008	.0008	.0037	.0026
	10	High alloyed steel, and tool steel	SFM(Vc)	300	300	390	390	350	350	350	350	350	310	410	410
			IPT(fz)	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0008	.0012	.0012
			RPM	7260	7260	7560	7560	6800	6800	6800	6800	6800	6050	6670	6670
			IPM(FEED)	17	17	28	28	23	23	23	23	23	18	31	31
			Ae	.0008	.0005	.0029	.0029	.0017	.0017	.0017	.0017	.0010	.0010	.0050	.0035
	11.1-11.2		SFM(Vc)	185	185	235	235	210	210	210	210	210	185	250	250
			IPT(fz)	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0008	.0012	.0012
			RPM	4430	4430	4530	4530	4080	4080	4080	4080	4080	3620	4030	4030
			IPM(FEED)	11	11	17	17	14	14	14	14	14	11	19	19
			Ae	.0006	.0004	.0022	.0022	.0013	.0013	.0013	.0013	.0008	.0008	.0037	.0026
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	300	300	390	390	350	350	350	350	350	310	410	410
			IPT(fz)	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0008	.0012	.0012
			RPM	7260	7260	7560	7560	6800	6800	6800	6800	6800	6050	6670	6670
			IPM(FEED)	17	17	28	28	23	23	23	23	23	18	31	31
			Ae	.0008	.0005	.0029	.0029	.0017	.0017	.0017	.0017	.0010	.0010	.0050	.0035
H	38.1-38.2	Hardened steel	SFM(Vc)	115	115	145	145	130	130	130	130	130	115	150	150
			IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004
			RPM	2820	2820	2780	2780	2500	2500	2500	2500	2500	2220	2400	2400
			IPM(FEED)	1.8	1.8	3.3	3.3	2.8	2.8	2.8	2.8	2.8	2.2	3.7	3.7
			Ae	.0005	.0003	.0017	.0017	.0010	.0010	.0010	.0010	.0006	.0006	.0030	.0021
	40	Chilled Cast Iron	SFM(Vc)	185	185	235	235	210	210	210	210	210	185	250	250
			IPT(fz)	.0006	.0006	.0009	.0009	.0009	.0009	.0009	.0009	.0009	.0008	.0012	.0012
			RPM	4430	4430	4530	4530	4080	4080	4080	4080	4080	3620	4030	4030
			IPM(FEED)	11	11	17	17	14	14	14	14	14	11	19	19
			Ae	.0006	.0004	.0022	.0022	.0013	.0013	.0013	.0013	.0008	.0008	.0037	.0026
	41	Hardened Cast Iron	SFM(Vc)	115	115	145	145	130	130	130	130	130	115	150	150
			IPT(fz)	.0002	.0002	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0004	.0004
			RPM	2820	2820	2780	2780	2500	2500	2500	2500	2500	2220	2400	2400
			IPM(FEED)	1.8	1.8	3.3	3.3	2.8	2.8	2.8	2.8	2.8	2.2	3.7	3.7
			Ae	.0005	.0003	.0017	.0017	.0010	.0010	.0010	.0010	.0006	.0006	.0030	.0021

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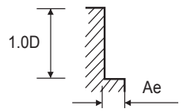
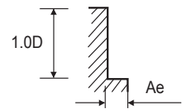


4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

SEME73 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Parameter	Diameter (Ø)											
			6	6	8	8	8	10	10	10	12	12	12
		LBS	30	32	25	30	42	30	35	45	35	40	50
P	1-8	SFM(Vc)	410	370	415	415	375	405	405	405	410	410	410
		IPT(fz)	.0012	.0011	.0017	.0017	.0015	.0018	.0018	.0018	.0019	.0019	.0019
		RPM	6670	6000	5040	5040	4540	3910	3910	3910	3300	3300	3300
		IPM(FEED)	31	25	34	34	27	29	29	29	24	24	24
		Ae	.0035	.0020	.0046	.0046	.0026	.0083	.0058	.0058	.0099	.0069	.0069
	9	SFM(Vc)	250	225	250	250	225	245	245	245	250	250	250
		IPT(fz)	.0012	.0011	.0015	.0015	.0013	.0015	.0015	.0015	.0015	.0015	.0015
		RPM	4030	3630	3020	3020	2720	2400	2400	2400	2010	2010	2010
		IPM(FEED)	19	16	18	18	14	14	14	14	12	12	12
		Ae	.0026	.0015	.0035	.0035	.0020	.0062	.0043	.0043	.0074	.0052	.0052
	10	SFM(Vc)	410	370	415	415	375	405	405	405	410	410	410
		IPT(fz)	.0012	.0011	.0017	.0017	.0015	.0018	.0018	.0018	.0019	.0019	.0019
		RPM	6670	6000	5040	5040	4540	3910	3910	3910	3300	3300	3300
		IPM(FEED)	31	25	34	34	27	29	29	29	24	24	24
		Ae	.0035	.0020	.0046	.0046	.0026	.0083	.0058	.0058	.0099	.0069	.0069
	11.1-11.2	SFM(Vc)	250	225	250	250	225	245	245	245	250	250	250
		IPT(fz)	.0012	.0011	.0015	.0015	.0013	.0015	.0015	.0015	.0015	.0015	.0015
		RPM	4030	3630	3020	3020	2720	2400	2400	2400	2010	2010	2010
		IPM(FEED)	19	16	18	18	14	14	14	14	12	12	12
		Ae	.0026	.0015	.0035	.0035	.0020	.0062	.0043	.0043	.0074	.0052	.0052
K	15-20	SFM(Vc)	410	370	415	415	375	405	405	405	410	410	410
		IPT(fz)	.0012	.0011	.0017	.0017	.0015	.0018	.0018	.0018	.0019	.0019	.0019
		RPM	6670	6000	5040	5040	4540	3910	3910	3910	3300	3300	3300
		IPM(FEED)	31	25	34	34	27	29	29	29	24	24	24
		Ae	.0035	.0020	.0046	.0046	.0026	.0083	.0058	.0058	.0099	.0069	.0069
H	38.1-38.2	SFM(Vc)	150	135	165	165	150	170	170	170	175	175	175
		IPT(fz)	.0004	.0004	.0006	.0006	.0006	.0006	.0006	.0006	.0007	.0007	.0007
		RPM	2400	2160	2010	2010	1810	1630	1630	1630	1400	1400	1400
		IPM(FEED)	3.7	3	5.1	5.1	4.1	4.1	4.1	4.1	3.7	3.7	3.7
		Ae	.0021	.0012	.0028	.0028	.0016	.0050	.0035	.0035	.0059	.0042	.0042
	40	SFM(Vc)	250	225	250	250	225	245	245	245	250	250	250
		IPT(fz)	.0012	.0011	.0015	.0015	.0013	.0015	.0015	.0015	.0015	.0015	.0015
		RPM	4030	3630	3020	3020	2720	2400	2400	2400	2010	2010	2010
		IPM(FEED)	19	16	18	18	14	14	14	14	12	12	12
		Ae	.0026	.0015	.0035	.0035	.0020	.0062	.0043	.0043	.0074	.0052	.0052
	41	SFM(Vc)	150	135	165	165	150	170	170	170	175	175	175
		IPT(fz)	.0004	.0004	.0006	.0006	.0006	.0006	.0006	.0006	.0007	.0007	.0007
		RPM	2400	2160	2010	2010	1810	1630	1630	1630	1400	1400	1400
		IPM(FEED)	3.7	3	5.1	5.1	4.1	4.1	4.1	4.1	3.7	3.7	3.7
		Ae	.0021	.0012	.0028	.0028	.0016	.0050	.0035	.0035	.0059	.0042	.0042



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME75 SERIES — 6 FLUTE 45° HELIX - SIDE CUTTING (NORMAL)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)										
						6	6	6	8	8	8	8	10	10	10	10
					LOC	15	20	30	20	30	35	40	25	30	40	50
P	1-8	Non-alloy steel	0.1D	1.5D	SFM(Vc)	360	360	360	365	365	365	365	365	365	365	365
					IPT(fz)	.0024	.0024	.002	.0031	.0031	.0031	.0027	.0039	.0039	.0039	.0033
					RPM	5840	5840	5840	4410	4410	4410	4410	3530	3530	3530	3530
					IPM(FEED)	83	83	70	83	83	83	70	83	83	83	70
	9	Low alloy steel	0.05D	1.5D	SFM(Vc)	250	250	250	255	255	255	255	250	250	250	250
					IPT(fz)	.0023	.0023	.002	.0031	.0031	.0031	.0026	.0039	.0039	.0039	.0033
					RPM	4075	4075	4075	3085	3085	3085	3085	2435	2435	2435	2435
					IPM(FEED)	57	57	48	57	57	57	48	57	57	57	48
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	360	360	360	365	365	365	365	365	365	365	365
					IPT(fz)	.0024	.0024	.002	.0031	.0031	.0031	.0027	.0039	.0039	.0039	.0033
					RPM	5840	5840	5840	4410	4410	4410	4410	3530	3530	3530	3530
					IPM(FEED)	83	83	70	83	83	83	70	83	83	83	70
	11.1-11.2		0.05D	1.5D	SFM(Vc)	250	250	250	255	255	255	255	250	250	250	250
					IPT(fz)	.0023	.0023	.002	.0031	.0031	.0031	.0026	.0039	.0039	.0039	.0033
					RPM	4075	4075	4075	3085	3085	3085	3085	2435	2435	2435	2435
					IPM(FEED)	57	57	48	57	57	57	48	57	57	57	48
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	360	360	360	365	365	365	365	365	365	365	365
					IPT(fz)	.0024	.0024	.002	.0031	.0031	.0031	.0027	.0039	.0039	.0039	.0033
					RPM	5840	5840	5840	4410	4410	4410	4410	3530	3530	3530	3530
					IPM(FEED)	83	83	70	83	83	83	70	83	83	83	70
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	105	105	105	100	100	100	100	110	110	110	110
					IPT(fz)	.0009	.0009	.0008	.0012	.0012	.0012	.001	.0014	.0014	.0014	.0012
					RPM	1660	1660	1660	1220	1220	1220	1220	1050	1050	1050	1050
					IPM(FEED)	9	9	8	9	9	9	8	9	9	9	8
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	250	250	250	255	255	255	255	250	250	250	250
					IPT(fz)	.0023	.0023	.002	.0031	.0031	.0031	.0026	.0039	.0039	.0039	.0033
					RPM	4075	4075	4075	3085	3085	3085	3085	2435	2435	2435	2435
					IPM(FEED)	57	57	48	57	57	57	48	57	57	57	48
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	105	105	105	100	100	100	100	110	110	110	110
					IPT(fz)	.0009	.0009	.0008	.0012	.0012	.0012	.001	.0014	.0014	.0014	.0012
					RPM	1660	1660	1660	1220	1220	1220	1220	1050	1050	1050	1050
					IPM(FEED)	9	9	8	9	9	9	8	9	9	9	8

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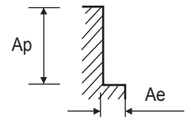


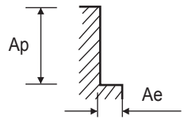
4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME75 SERIES — 6 FLUTE 45° HELIX - SIDE CUTTING (NORMAL)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Ae	Ap	Parameter	Diameter (Ø)											
					12	12	12	12	16	16	16	16	16	20	20	20	20
				LOC	30	40	50	60	40	50	60	90	110	45	60	70	110
P	1-8	0.1D	1.5D	SFM(Vc)	370	370	370	370	365	365	365	325	325	365	365	365	325
				IPT(fz)	.0039	.0039	.0033	.0029	.004	.004	.0034	.003	.003	.0039	.0039	.0034	.003
				RPM	2980	2980	2980	2980	2205	2205	2205	1985	1985	1765	1765	1765	1585
				IPM(FEED)	70	70	59	52	52	52	44	35	35	42	42	36	28
	9	0.05D	1.5D	SFM(Vc)	260	260	260	260	255	255	255	230	230	250	250	250	225
				IPT(fz)	.0038	.0038	.0032	.0029	.0039	.0039	.0033	.0029	.0029	.0039	.0039	.0033	.003
				RPM	2100	2100	2100	2100	1555	1555	1555	1395	1395	1220	1220	1220	1090
				IPM(FEED)	48	48	41	36	36	36	31	25	25	29	29	24	19
	10	0.1D	1.5D	SFM(Vc)	370	370	370	370	365	365	365	325	325	365	365	365	325
				IPT(fz)	.0039	.0039	.0033	.0029	.004	.004	.0034	.003	.003	.0039	.0039	.0034	.003
				RPM	2980	2980	2980	2980	2205	2205	2205	1985	1985	1765	1765	1765	1585
				IPM(FEED)	70	70	59	52	52	52	44	35	35	42	42	36	28
	11.1-11.2	0.05D	1.5D	SFM(Vc)	260	260	260	260	255	255	255	230	230	250	250	250	225
				IPT(fz)	.0038	.0038	.0032	.0029	.0039	.0039	.0033	.0029	.0029	.0039	.0039	.0033	.003
				RPM	2100	2100	2100	2100	1555	1555	1555	1395	1395	1220	1220	1220	1090
				IPM(FEED)	48	48	41	36	36	36	31	25	25	29	29	24	19
K	15-20	0.1D	1.5D	SFM(Vc)	370	370	370	370	365	365	365	325	325	365	365	365	325
				IPT(fz)	.0039	.0039	.0033	.0029	.004	.004	.0034	.003	.003	.0039	.0039	.0034	.003
				RPM	2980	2980	2980	2980	2205	2205	2205	1985	1985	1765	1765	1765	1585
				IPM(FEED)	70	70	59	52	52	52	44	35	35	42	42	36	28
H	38.1-38.2	0.05D	1.0D	SFM(Vc)	110	110	110	110	110	110	110	100	100	110	110	110	100
				IPT(fz)	.0014	.0014	.0012	.001	.0013	.0013	.0011	.001	.001	.0014	.0014	.0012	.0011
				RPM	880	880	880	880	670	670	670	610	610	525	525	525	475
				IPM(FEED)	8	8	7	6	5	5	5	4	4	5	5	4	3
	40	0.05D	1.5D	SFM(Vc)	260	260	260	260	255	255	255	230	230	250	250	250	225
				IPT(fz)	.0038	.0038	.0032	.0029	.0039	.0039	.0033	.0029	.0029	.0039	.0039	.0033	.003
				RPM	2100	2100	2100	2100	1555	1555	1555	1395	1395	1220	1220	1220	1090
				IPM(FEED)	48	48	41	36	36	36	31	25	25	29	29	24	19
	41	0.05D	1.0D	SFM(Vc)	110	110	110	110	110	110	110	100	100	110	110	110	100
				IPT(fz)	.0014	.0014	.0012	.001	.0013	.0013	.0011	.001	.001	.0014	.0014	.0012	.0011
				RPM	880	880	880	880	670	670	670	610	610	525	525	525	475
				IPM(FEED)	8	8	7	6	5	5	5	4	4	5	5	4	3



4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME75 SERIES 6 FLUTE 45° HELIX - SIDE CUTTING (HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						6	6	6	8	8	8	8	10	10	10	10	12
					LOC	15	20	30	20	30	35	40	25	30	40	50	30
P	9	Non-alloy steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	1090	1080	1080	1080	1080	1090
					IPT(fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.0039	.0039	.0039	.0034	.0039
					RPM	17640	17640	17640	13230	13230	13230	13230	10480	10480	10480	10480	8820
					IPM(FEED)	252	252	214	252	252	252	214	248	248	248	210	208
	11.1-11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	1090	1080	1080	1080	1080	1090
					IPT(fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.0039	.0039	.0039	.0034	.0039
					RPM	17640	17640	17640	13230	13230	13230	13230	10480	10480	10480	10480	8820
					IPM(FEED)	252	252	214	252	252	252	214	248	248	248	210	208
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	545	545	545	545	545	545
					IPT(fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.004	.004	.004	.0034	.0039
					RPM	8820	8820	8820	6615	6615	6615	6615	5290	5290	5290	5290	4410
					IPM(FEED)	126	126	107	126	126	126	107	126	126	126	107	104
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	1090	1080	1080	1080	1080	1090
					IPT(fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.0039	.0039	.0039	.0034	.0039
					RPM	17640	17640	17640	13230	13230	13230	13230	10480	10480	10480	10480	8820
					IPM(FEED)	252	252	214	252	252	252	214	248	248	248	210	208
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	545	545	545	545	545	545
					IPT(fz)	.0024	.0024	.002	.0032	.0032	.0032	.0027	.004	.004	.004	.0034	.0039
					RPM	8820	8820	8820	6615	6615	6615	6615	5290	5290	5290	5290	4410
					IPM(FEED)	126	126	107	126	126	126	107	126	126	126	107	104

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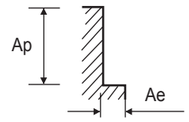


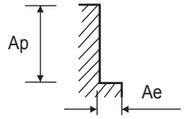
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

4G MILL END MILLS

RECOMMENDED CUTTING CONDITIONS

SEME75 SERIES 6 FLUTE 45° HELIX - SIDE CUTTING (HIGH SPEED)

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						12	12	12	16	16	16	16	16	20	20	20	20
					LOC	40	50	60	40	50	60	90	110	45	60	70	110
P	9	Non-alloy steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	980	980	1090	1090	1090	980
					IPT(fz)	.0039	.0034	.003	.0039	.0039	.0034	.003	.003	.004	.004	.0034	.003
					RPM	8820	8820	8820	6615	6615	6615	5955	5955	5290	5290	5290	4765
					IPM(FEED)	208	177	156	156	156	133	106	106	126	126	107	85
	11.1-11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	980	980	1090	1090	1090	980
					IPT(fz)	.0039	.0034	.003	.0039	.0039	.0034	.003	.003	.004	.004	.0034	.003
					RPM	8820	8820	8820	6615	6615	6615	5955	5955	5290	5290	5290	4765
					IPM(FEED)	208	177	156	156	156	133	106	106	126	126	107	85
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	490	490	545	545	545	490
					IPT(fz)	.0039	.0033	.003	.0039	.0039	.0033	.003	.003	.0038	.0038	.0033	.0029
					RPM	4410	4410	4410	3320	3320	3320	2980	2980	2645	2645	2645	2385
					IPM(FEED)	104	88	78	78	78	66	53	53	61	61	52	41
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1090	1090	1090	1090	1090	1090	980	980	1090	1090	1090	980
					IPT(fz)	.0039	.0034	.003	.0039	.0039	.0034	.003	.003	.004	.004	.0034	.003
					RPM	8820	8820	8820	6615	6615	6615	5955	5955	5290	5290	5290	4765
					IPM(FEED)	208	177	156	156	156	133	106	106	126	126	107	85
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	545	545	545	545	545	545	490	490	545	545	545	490
					IPT(fz)	.0039	.0033	.003	.0039	.0039	.0033	.003	.003	.0038	.0038	.0033	.0029
					RPM	4410	4410	4410	3320	3320	3320	2980	2980	2645	2645	2645	2385
					IPM(FEED)	104	88	78	78	78	66	53	53	61	61	52	41



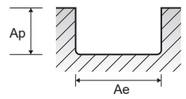
4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6	8	10	12	16	20
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52
	3-5		1.0D	0.8D	SFM(Vc)	655	670	660	670	675	660
					IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016
					RPM	10600	8100	6400	5400	4100	3200
					IPM(FEED)	26	26	26	26	27	26
	6	Low alloy steel	1.0D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52
	7-9		1.0D	0.8D	SFM(Vc)	655	670	660	670	675	660
					IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016
					RPM	10600	8100	6400	5400	4100	3200
					IPM(FEED)	26	26	26	26	27	26
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52
	11.1		1.0D	0.8D	SFM(Vc)	655	670	660	670	675	660
					IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016
					RPM	10600	8100	6400	5400	4100	3200
					IPM(FEED)	26	26	26	26	27	26
K	15	Stainless steel	1.0D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52
	16	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.8D	SFM(Vc)	655	670	660	670	675	660
					IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016
					RPM	10600	8100	6400	5400	4100	3200
					IPM(FEED)	26	26	26	26	27	26
	17	Hardened steel	1.0D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52
	18	Chilled Cast Iron	1.0D	0.8D	SFM(Vc)	655	670	660	670	675	660
					IPT(fz)	.0006	.0008	.001	.0012	.0013	.0016
					RPM	10600	8100	6400	5400	4100	3200
					IPM(FEED)	26	26	26	26	27	26
	19-20	Hardened Cast Iron	1.0D	1.0D	SFM(Vc)	740	740	740	740	740	740
					IPT(fz)	.0013	.0018	.0023	.0025	.0026	.0029
					RPM	12000	9000	7200	6000	4500	3600
					IPM(FEED)	61	65	65	61	59	52



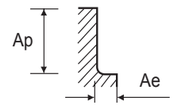
4G MILL END MILLS — RECOMMENDED CUTTING CONDITIONS

G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6	8	10	12	16	20
P	1-2	Non-alloy steel	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035
					RPM	15800	11900	9500	8000	6000	4800
					IPM(FEED)	101	106	106	101	97	84
	3-5		0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028
					RPM	14300	10700	8500	7100	5400	4300
					IPM(FEED)	73	77	77	73	69	59
	6	Low alloy steel	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035
					RPM	15800	11900	9500	8000	6000	4800
					IPM(FEED)	101	106	106	101	97	84
	7-9		0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028
					RPM	14300	10700	8500	7100	5400	4300
					IPM(FEED)	73	77	77	73	69	59
	10	High alloyed steel, and tool steel	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	15800	11900	9500	8000	6000	4800
					RPM	.0016	.0022	.0028	.0032	.0032	.0035
					IPM(FEED)	101.2	106.3	106.3	101.2	96.5	84.3
	11.1		0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028
					RPM	14300	10700	8500	7100	5400	4300
					IPM(FEED)	73	77	77	73	69	59
K	15	Grey cast iron	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035
					RPM	15800	11900	9500	8000	6000	4800
					IPM(FEED)	101	106	106	101	97	84
	16		0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028
					RPM	14300	10700	8500	7100	5400	4300
					IPM(FEED)	73	77	77	73	69	59
	17	Nodular cast iron	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035
					RPM	15800	11900	9500	8000	6000	4800
					IPM(FEED)	101	106	106	101	97	84
	18		0.35D	1.0D	SFM(Vc)	885	880	875	880	890	885
					IPT(fz)	.0013	.0018	.0023	.0026	.0026	.0028
					RPM	14300	10700	8500	7100	5400	4300
					IPM(FEED)	73	77	77	73	69	59
	19-20	Malleable cast iron	0.5D	1.0D	SFM(Vc)	975	980	980	990	990	990
					IPT(fz)	.0016	.0022	.0028	.0032	.0032	.0035
					RPM	15800	11900	9500	8000	6000	4800
					IPM(FEED)	101	106	106	101	97	84



4G MILL END MILLS

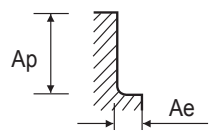
RECOMMENDED CUTTING CONDITIONS

GAE53 SERIES

4&5 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						6	8	10	12	14	16	18	20
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	200	225	220	225	225	230	225	225
					IPT(fz)	.0007	.0011	.0020	.0024	.0022	.0024	.0028	.0032
					RPM	3250	2750	2150	1800	1550	1400	1200	1100
					IPM(FEED)	9	12	17	17	17	17	17	18
	2		0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175
					IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032
					RPM	2500	2150	1700	1400	1200	1100	1000	850
					IPM(FEED)	7	9	13	14	14	14	14	14
	3-4		0.5D	1.5D	SFM(Vc)	110	130	125	125	125	125	130	125
					IPT(fz)	.0007	.0011	.0017	.0024	.0022	.0025	.0027	.0031
					RPM	1800	1550	1200	1000	850	750	700	600
					IPM(FEED)	5	7	8	9	9	9	9	9
	5		0.5D	1.5D	SFM(Vc)	95	100	105	105	100	100	100	105
					IPT(fz)	.0007	.0011	.0017	.0022	.0021	.0025	.0027	.0030
					RPM	1500	1200	1000	850	700	600	550	500
					IPM(FEED)	4	5	7	7	7	7	7	7
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175
					IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032
					RPM	2500	2150	1700	1400	1200	1100	1000	850
					IPM(FEED)	7	9	13	14	14	14	14	14
	7		0.5D	1.5D	SFM(Vc)	110	130	125	125	125	125	130	125
					IPT(fz)	.0007	.0011	.0017	.0024	.0022	.0025	.0027	.0031
					RPM	1800	1550	1200	1000	850	750	700	600
					IPM(FEED)	5	7	8	9	9	9	9	9
	8-9		0.5D	1.5D	SFM(Vc)	95	100	105	105	100	100	100	105
					IPT(fz)	.0007	.0011	.0017	.0022	.0021	.0025	.0027	.0030
					RPM	1500	1200	1000	850	700	600	550	500
					IPM(FEED)	4	5	7	7	7	7	7	7
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175
					IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032
					RPM	2500	2150	1700	1400	1200	1100	1000	850
					IPM(FEED)	7	9	13	14	14	14	14	14
	11.1		0.5D	1.5D	SFM(Vc)	95	100	105	105	100	100	100	105
					IPT(fz)	.0007	.0011	.0017	.0022	.0021	.0025	.0027	.0030
					RPM	1500	1200	1000	850	700	600	550	500
					IPM(FEED)	4	5	7	7	7	7	7	7
M	14.1-14.2	Stainless steel	0.5D	1.5D	SFM(Vc)	110	120	120	115	125	115	120	125
					IPT(fz)	.0007	.0012	.0017	.0025	.0023	.0028	.0030	.0032
					RPM	1750	1450	1150	950	850	700	650	600
					IPM(FEED)	5	7	8	10	10	10	10	10
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	155	175	175	175	175	180	185	175
					IPT(fz)	.0007	.0011	.0019	.0025	.0023	.0025	.0028	.0032
					RPM	2500	2150	1700	1400	1200	1100	1000	850
					IPM(FEED)	7	9	13	14	14	14	14	14



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X-POWER PRO END MILLS

- For Pre-Hardened Steels up to HRc55

SELECTION GUIDE

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SOLID CARBIDE
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For Pre-Hardened Steels up to HRc55

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◎ : Excellent ○ : Good

Recommended cutting conditions : p.C495

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	GM153	GM207	GM639	GM649	GM212
		SERIES					GM153	GM207	GM639	GM649	GM212
		FLUTE					4	4	4	4	4
		HELIX ANGLE					30°	30°	30°	30°	30°
		CUTTING EDGE SHAPE					SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
		SIZE MIN					D1/16	D1/8	D1/16	D1/16	D1/4
		SIZE MAX					D1	D1	D1/2	D1/2	D1/2
		PAGE					C458	C459	C460	C461	C462
							REGULAR LENGTH	LONG LENGTH	STUB LENGTH	REGULAR LENGTH	LONG LENGTH
							Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	○				
	13		Martensitic	Quenched & Tempered	240	23	○				
	14		Austenitic		180	10	○				
K	15	Grey cast iron	Pearlitic / ferritic		180	10					
	16		Pearlitic (Martensitic)		260	26					
	17	Nodular cast iron	Ferritic		160	3					
	18		Pearlitic		250	25					
	19	Malleable cast iron	Ferritic		130						
	20		Pearlitic		230	21					
N	21	Aluminum-wrought alloy	Not Curable		60						
	22		Curable	Hardened	100						
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75						
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130						
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						
	27		CuZn, CuSnZn (Brass)		90						
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55	○	○	○	○	○
	39			Hardened	630	60					
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	○	○

GM103	GM208	GM218	GM668	GM209	GM210	GM961	GM960	GM109	GM963	GM967	GM096	GM097	
4	6&8	6&8	6&8	2	4	2	2	2	2	2	2	4	
45°	45°	45°	45°	30°	30°	30°	30°	15°	30°	30°	30°	30°	
CORNER RADIUS	SQUARE	SQUARE	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	
D3/8	D1/4	D1/4	D1/4	R1/64	R1/16	R1/16	R.012	R1/64	R1/32	R1/64	R1/16	R1/16	
D7/8	D1	D1	D3/4	R3/8	R3/8	R1/2	R. 031	R1/4	R3/16	R1/16	R5/16	R5/16	
C463	C464		C465	C466	C467	C468	C469	C470	C471	C472	C473	C474	
LONG REACH	LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH	LONG LENGTH	LONG LENGTH	MEDIUM LENGTH	MINIATURE	STUB CUT LENGTH	TAPER NECK	RIB PROCESSING	LONG LENGTH	LONG LENGTH	
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	
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CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
X-POWER PRO
END MILLS

For Pre-Hardened Steels up to HRc55

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C495

							Inch		Metric		
						SERIES	GM666	GM156	GM876	GM813	GM886
						FLUTE	3~5	3~5	2	2	2
						HELIX ANGLE	20°	20°	30°	30°	30°
						CUTTING EDGE SHAPE	ROUGHING	ROUGHING	BALL NOSE	BALL NOSE	BALL NOSE
						SIZE MIN	D1/4	D1/4	R0.5	R0.5	R0.25
						SIZE MAX	D1	D1	R8.0	R10.0	R3.0
						PAGE	C475		C476	C477	C478
							STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH	SHORT LENGTH	LONG LENGTH	RIB PROCESSING
							Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc					
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	○	○	○
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	○	○	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15					
	13		Martensitic	Quenched & Tempered	240	23					
	14		Austenitic		180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10			○	○	○
	16		Pearlitic (Martensitic)		260	26			○	○	○
	17	Nodular cast iron	Ferritic		160	3			○	○	○
	18		Pearlitic		250	25			○	○	○
	19	Malleable cast iron	Ferritic		130				○	○	○
	20		Pearlitic		230	21			○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60						
	22		Curable	Hardened	100						
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75						
	24		≤ 12% Si, Curable	Hardened	90						
	25		> 12% Si, Not Curable		130						
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						
	27		CuZn, CuSnZn (Brass)		90						
	28		CuSn, lead-free copper and electrolytic copper		100						
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic								
	30		Rubber, Wood, etc.								
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15					
	32			Cured	280	30					
	33		Ni or Co Based	Annealed	250	25					
	34			Cured	350	38					
	35			Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm						
	37		Alpha + Beta Alloys	Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55	○	○	○	○	○
	39			Hardened	630	60					
	40	Chilled Cast Iron		Cast	400	42	◎	◎	◎	◎	◎
	41	Hardened Cast Iron		Hardened	550	55	○	○	○	○	○

															Metric				
GM902	GM815	GM818	GM8A1	GM839	GM819	GM810	GM883	GM895	GM811	GM817	GM812	GM834	GM814	SERIES
2	4	2	2	4	4	2	2	3	4	4	6&8	6	3&4	FLUTE
30°	30°	30°	30°	30°	30°	30°	30°	38°	30°	30°	45°	45°	20°	HELIX ANGLE
BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING	CUTTING EDGE SHAPE
R0.5	R1.0	D4.0	D1.0	D2.0	D3.0	D0.4	D0.4	D1.0	D2.0	D2.0	D6.0	D6.0	D6.0	SIZE MIN
R4.0	R8.0	D12.0	D6.0	D12.0	D20.0	D20.0	D6.0	D16.0	D25.0	D20.0	D20.0	D25.0	D20.0	SIZE MAX
C480	C481	C482	C483	C484	C485	C486	C487	C489	C490	C491	C492	C493	C494	PAGE
TAPER NECK	LONG REACH	LONG LENGTH	RIB PROCESSING	STUB LENGTH	LONG LENGTH	SHORT LENGTH	RIB PROCESSING	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH FINE PITCH	
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	
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CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
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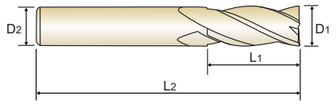
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

PLAIN SHANK **GM153 SERIES**

CARBIDE, 4 FLUTE REGULAR LENGTH

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ▶ 4 flute allows for better workpiece finishes.
- ▶ Increased production.



MG | 4 | 30° | PLAIN | Y Coating | p.C495

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM153004	**1/16**	1/8	3/16	1-1/2
GM153008	**1/8**	1/8	1/2	1-1/2
GM153012	**3/16**	3/16	5/8	2
GM153016	**1/4**	1/4	3/4	2-1/2
GM153020	**5/16**	5/16	13/16	2-1/2
GM153024	**3/8**	3/8	1	2-1/2
GM153028	**7/16**	7/16	1	2-3/4
GM153032	**1/2**	1/2	1	3
GM153040	**5/8**	5/8	1-1/4	3-1/2
GM153048	**3/4**	3/4	1-1/2	4
GM153064	**1**	1	1-1/2	4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○						

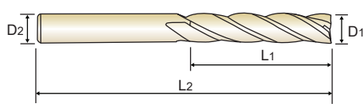
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM207 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH

- ▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- ▶ 4 flute allows for better workpiece finishes.
- ▶ Increased production.



MG | 4 | 30° | PLAIN | Y Coating | p.C496

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM207008	**1/8**	1/8	3/4	2-1/4
GM207012	**3/16**	3/16	3/4	2-1/2
GM207016	**1/4**	1/4	1-1/8	3
GM207020	**5/16**	5/16	1-1/8	3
GM207024	**3/8**	3/8	1-1/8	3
GM207032	**1/2**	1/2	2	4
GM207040	**5/8**	5/8	2-1/4	5
GM207048	**3/4**	3/4	2-1/4	5
GM207064	**1**	1	2-1/4	5

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

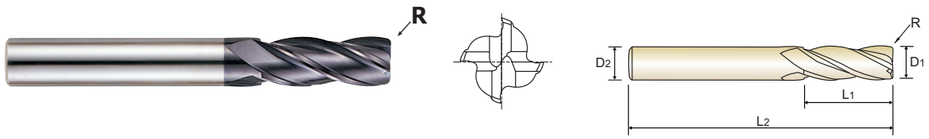
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM639** SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.



MG | 4 | 30° | R ±.001 | PLAIN | Y Coating | p.C497

Unit : Inch

EDP No.	Corner Radius R (±.001)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM639004	R.008	**1/16**	1/4	1/8	2-1/4
GM639008	R.01	**1/8**	1/4	1/4	2-1/4
GM639901	R.02	**1/8**	1/4	1/4	2-1/4
GM639012	R.01	**3/16**	1/4	3/8	2-1/2
GM639903	R.02	**3/16**	1/4	3/8	2-1/2
GM639904	R.03	**3/16**	1/4	3/8	2-1/2
GM639016	R.01	**1/4**	1/4	1/2	3
GM639905	R.02	**1/4**	1/4	1/2	3
GM639906	R.03	**1/4**	1/4	1/2	3
GM639020	R.02	**5/16**	5/16	1/2	3
GM639907	R.03	**5/16**	5/16	1/2	3
GM639908	R.06	**5/16**	5/16	1/2	3
GM639024	R.02	**3/8**	3/8	5/8	3
GM639910	R.03	**3/8**	3/8	5/8	3
GM639911	R.06	**3/8**	3/8	5/8	3
GM639912	R.09	**3/8**	3/8	5/8	3
GM639032	R.02	**1/2**	1/2	5/8	4
GM639913	R.03	**1/2**	1/2	5/8	4
GM639914	R.06	**1/2**	1/2	5/8	4
GM639915	R.09	**1/2**	1/2	5/8	4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎										

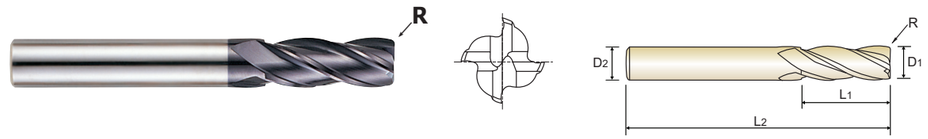
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM649** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.



MG | 4 | 30° | R ±.001 | PLAIN | Y Coating | p.C497

Unit : Inch

EDP No.	Corner Radius R (±.001)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM649004	R.008	**1/16**	1/4	3/16	2-1/4
GM649008	R.01	**1/8**	1/4	1/2	2-1/4
GM649901	R.02	**1/8**	1/4	1/2	2-1/4
GM649012	R.01	**3/16**	1/4	5/8	2-1/2
GM649903	R.02	**3/16**	1/4	5/8	2-1/2
GM649904	R.03	**3/16**	1/4	5/8	2-1/2
GM649016	R.01	**1/4**	1/4	3/4	3
GM649905	R.02	**1/4**	1/4	3/4	3
GM649906	R.03	**1/4**	1/4	3/4	3
GM649020	R.02	**5/16**	5/16	13/16	3
GM649907	R.03	**5/16**	5/16	13/16	3
GM649908	R.06	**5/16**	5/16	13/16	3
GM649024	R.02	**3/8**	3/8	1	3
GM649910	R.03	**3/8**	3/8	1	3
GM649911	R.06	**3/8**	3/8	1	3
GM649912	R.09	**3/8**	3/8	1	3
GM649028	R.02	**7/16**	7/16	1	4
GM649916	R.03	**7/16**	7/16	1	4
GM649917	R.06	**7/16**	7/16	1	4
GM649032	R.02	**1/2**	1/2	1	4
GM649913	R.03	**1/2**	1/2	1	4
GM649914	R.06	**1/2**	1/2	1	4
GM649915	R.09	**1/2**	1/2	1	4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎										

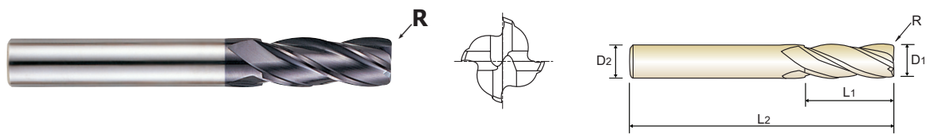
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM212** SERIES

CARBIDE, 4 FLUTE CORNER RADIUS LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.



MG | 4 | 30° | R ±.001 | PLAIN | Y Coating | p.C497

Unit : Inch

EDP No.	Corner Radius R (±.001)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM212016	R.02	**1/4**	1/4	1-1/8	3
GM212901	R.03	**1/4**	1/4	1-1/8	3
GM212020	R.02	**5/16**	5/16	1-1/8	3
GM212902	R.03	**5/16**	5/16	1-1/8	3
GM212903	R.06	**5/16**	5/16	1-1/8	3
GM212024	R.02	**3/8**	3/8	1-1/8	3
GM212905	R.03	**3/8**	3/8	1-1/8	3
GM212906	R.06	**3/8**	3/8	1-1/8	3
GM212032	R.02	**1/2**	1/2	2	4
GM212908	R.03	**1/2**	1/2	2	4
GM212909	R.06	**1/2**	1/2	2	4
GM212910	R.09	**1/2**	1/2	2	4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM103** SERIES

CARBIDE, 4 FLUTE 45° HELIX LONG REACH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.

MG | 4 | 45° | R ±.001 | PLAIN | Y Coating | p.C498

Unit : Inch

EDP No.	Corner Radius R (±.001)	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2
GM103024	R.02	**3/8**	5/16	5/8	3/4	5
GM103901	R.04	**3/8**	5/16	5/8	3/4	5
GM103032	R.02	**1/2**	3/8	3/4	7/8	6
GM103902	R.04	**1/2**	3/8	3/4	7/8	6
GM103040	R.02	**5/8**	1/2	7/8	1	6-1/2
GM103903	R.04	**5/8**	1/2	7/8	1	6-1/2
GM103048	R.02	**3/4**	5/8	1	1-1/8	7
GM103904	R.04	**3/4**	5/8	1	1-1/8	7
GM103056	R.02	**7/8**	3/4	1-1/4	1-3/8	8

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	○	○						

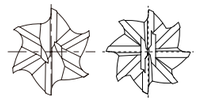
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

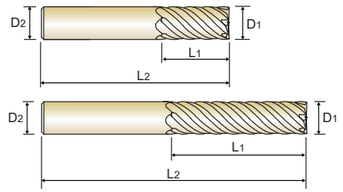
X-POWER PRO END MILLS

LONG LENGTH PLAIN SHANK **GM208 SERIES**
EXTRA LONG LENGTH PLAIN SHANK **GM218 SERIES**

CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH & EXTRA LONG LENGTH

- ▶ Designed to machine high hardened materials.
- ▶ High speed cutting and finish milling with high feed rate.
- ▶ Superior workpiece finishes.
- ▶ Superior wear resistant.
- ▶ Suitable for dry milling.
- ▶ Corner Protection against chipping.





MG HM | 6&8 | 45° | PLAIN | Y Coating | p.C500

GM208 series - LONG LENGTH

Unit : Inch

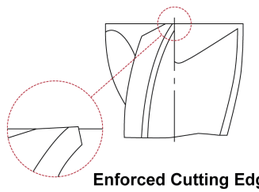
EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
GM208016	1/4	1/4	1/2	2-1/4	6
GM208020	5/16	5/16	3/4	2-1/2	6
GM208024	3/8	3/8	7/8	2-7/8	6
GM208032	1/2	1/2	1	3-1/4	6
GM208040	5/8	5/8	1-1/4	3-5/8	6
GM208048	3/4	3/4	1-1/2	4-1/8	8
GM208064	1	1	1-3/4	4-1/4	8

GM218 series - EXTRA LONG LENGTH

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
GM218016	1/4	1/4	1	2-3/4	6
GM218020	5/16	5/16	1-1/2	3-5/8	6
GM218024	3/8	3/8	1-3/4	4	6
GM218032	1/2	1/2	2-3/16	4-3/8	6
GM218040	5/8	5/8	2-5/8	5-1/8	6
GM218048	3/4	3/4	2-1/4	5	8
GM218901	3/4	3/4	3-1/4	6	8
GM218902	3/4	3/4	4-1/8	7	8
GM218064	1	1	4-1/8	7	8

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

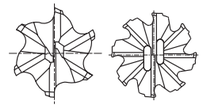
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

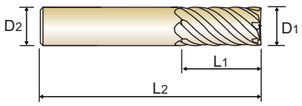
X-POWER PRO END MILLS

PLAIN SHANK **GM668 SERIES**

CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS

- ▶ Designed to machine high hardened materials.
- ▶ High speed cutting and finish milling with high feed rate.
- ▶ Superior workpiece finishes.
- ▶ Superior wear resistant.
- ▶ Suitable for dry milling.
- ▶ Corner Protection against chipping.





MG HM | 6&8 | 45° | PLAIN | Y Coating | p.C502

Unit : Inch

EDP No.	Corner Radius R	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2
GM668016	R.02	1/4	1/4	1/2	2-1/4	6
GM668020	R.02	5/16	5/16	3/4	2-1/2	6
GM668024	R.02	3/8	3/8	7/8	2-7/8	6
GM668032	R.02	1/2	1/2	1	3-1/4	6
GM668040	R.03	5/8	5/8	1-1/4	3-5/8	6
GM668048	R.03	3/4	3/4	1-1/2	4-1/8	8
GM668901	R.03	3/8	3/8	7/8	2-7/8	6
GM668902	R.03	1/2	1/2	1	3-1/4	6
GM668904	R.06	3/4	3/4	1-1/2	4-1/8	8

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

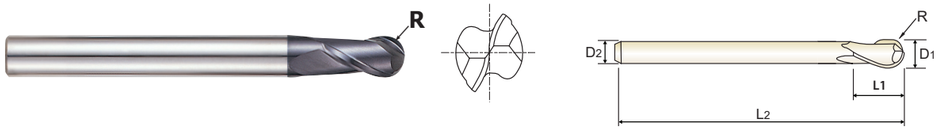
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM209 SERIES**

CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
▶ For copy-milling machines.



MG | 2 | 30° | R ±.001 | PLAIN | Y Coating | p.C503

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±.001)	D1	D2	L1	L2
GM209901	R1/64	**1/32**	1/4	1/32	2-1/2
GM209902	R1/32	**1/16**	1/4	1/16	2-1/2
GM209903	R3/64	**3/32**	1/4	3/32	2-1/2
GM209008	R1/16	**1/8**	1/8	5/16	2-3/8
GM209012	R3/32	**3/16**	3/16	3/8	3-1/8
GM209016	R1/8	**1/4**	1/4	1/2	3-1/2
GM209020	R5/32	**5/16**	5/16	9/16	4
GM209024	R3/16	**3/8**	3/8	3/4	4
GM209032	R1/4	**1/2**	1/2	7/8	4-1/4
GM209048	R3/8	**3/4**	3/4	1-1/2	6-1/4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

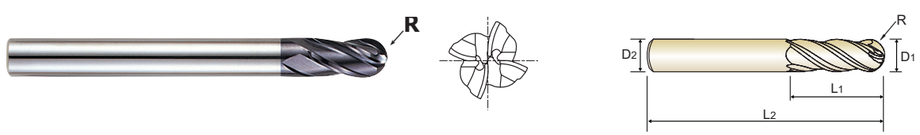
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM210 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE

▶ Designed to machine tool steels, alloy steels, mold steels and other high hardened materials.
▶ For copy - milling machines.
▶ 4 Flute design - higher feed than GM209 series



MG | 4 | 30° | R ±.001 | PLAIN | Y Coating | p.C504

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±.001)	D1	D2	L1	L2
GM210008	R1/16	**1/8**	1/8	5/16	2-3/8
GM210012	R3/32	**3/16**	3/16	3/8	3-1/8
GM210016	R1/8	**1/4**	1/4	1/2	3-1/2
GM210020	R5/32	**5/16**	5/16	9/16	4
GM210024	R3/16	**3/8**	3/8	3/4	4
GM210032	R1/4	**1/2**	1/2	7/8	4-1/4
GM210040	R5/16	**5/8**	5/8	1-1/4	5-1/2
GM210048	R3/8	**3/4**	3/4	1-1/2	6-1/4

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

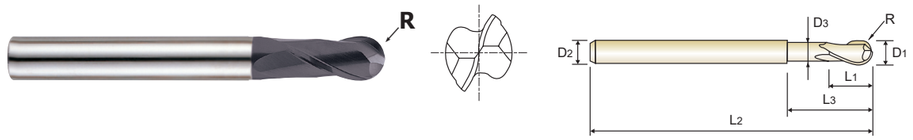
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM961** SERIES

CARBIDE, 2 FLUTE MEDIUM LENGTH BALL NOSE

- ▶ Deep slotting milling is possible by reduced neck.
- ▶ High efficiency milling is possible in deep slotting with projection of the end mill being long.



MG | 2 | 30° | R ±.001 | PLAIN | Y Coating | p.C505

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.001)	D1	D2	L1	L3	L2	D3
GM961008	R1/16	**1/8**	1/4	5/16	-	2-3/4	-
GM961012	R3/32	**3/16**	1/4	1/2	-	3-1/8	-
GM961016	R1/8	**1/4**	1/4	1/2	7/8	3-1/8	.242
GM961020	R5/32	**5/16**	5/16	9/16	1-1/16	3-1/2	.305
GM961024	R3/16	**3/8**	3/8	3/4	1-1/4	4	.367
GM961032	R1/4	**1/2**	1/2	7/8	1-3/8	4-1/4	.492
GM961064	R1/2	**1**	1	2-1/8	3	7	.992

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

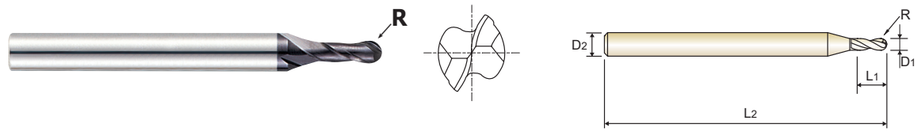
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM960** SERIES

CARBIDE, 2 FLUTE MINIATURE BALL NOSE

- ▶ High precision milling in medical, optical, electronics and aerospace industrials.
- ▶ Excellent performance at dry cutting conditon.
- ▶ Excellent performance on high hardened steel up to HRc70.



MG | 2 | 30° | R ±.0005 | PLAIN | Y Coating | p.C506

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R (±.0005)	D1	D2	L1	L2
GM960924	R.0120	**.024**	1/8	.043	1-1/2
GM960931	R.0155	**.031**	1/8	.080	1-1/2
GM960940	R.0200	**.040**	1/8	.100	1-1/2
GM960943	R.0215	**.043**	1/8	.118	1-1/2
GM960947	R.0235	**.047**	1/8	.118	1-1/2
GM960952	R.0260	**.052**	1/8	.138	1-1/2
GM960955	R.0275	**.055**	1/8	.138	1-1/2
GM960962	R.0310	**.062**	1/8	.157	1-1/2

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0010	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended					◎			◎	◎		◎									

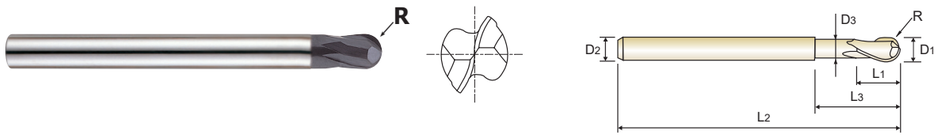
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM109 SERIES**

CARBIDE, 2 FLUTE 15° HELIX STUB CUT LENGTH BALL NOSE

▶ Deep slotting milling is possible by reduced neck.
▶ High efficiency milling is possible in deep slotting with projection of the end mill being long.



MG | 2 | 15° | R ±.0005 | PLAIN | Y Coating | p.C507

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0005)	D1	D2	L1	L3	L2	D3
GM109002	R1/64	**1/32**	1/4	1/32	1/16	2	.029
GM109004	R1/32	**1/16**	1/4	1/16	1/8	2	.059
GM109006	R3/64	**3/32**	1/4	3/32	3/16	2	.090
GM109008	R1/16	**1/8**	1/4	1/8	1/4	2-1/2	.121
GM109012	R3/32	**3/16**	1/4	3/16	3/8	3	.184
GM109016	R1/8	**1/4**	1/4	1/4	1/2	3-1/2	.246
GM109020	R5/32	**5/16**	5/16	5/16	5/8	4	.309
GM109024	R3/16	**3/8**	3/8	3/8	3/4	4	.371
GM109032	R1/4	**1/2**	1/2	1/2	1	4-1/2	.496

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

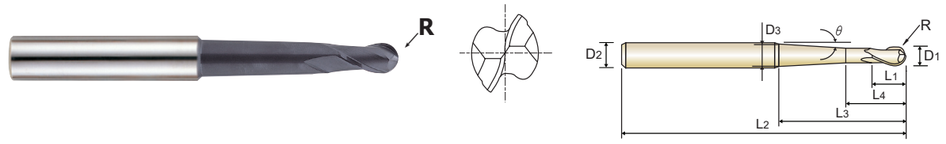
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		◎			◎

X-POWER PRO END MILLS

PLAIN SHANK **GM963 SERIES**

CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

▶ High efficiency milling in deep slotting due to long projection of the end mills.



MG | 2 | 30° | R ±.0005 | PLAIN | Y Coating | p.C508

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Under Neck Parallel Length	Length Below Shank	Overall Length	Neck Diameter	Taper Neck Angle
	R (±.0005)	D1	D2	L1	L4	L3	L2	D3	θ
GM963004	R1/32	**1/16**	1/4	5/32	15/64	7/8	2-3/8	.096	1° 30′
GM963901	R1/32	**1/16**	1/4	5/32	15/64	1-5/8	3-1/8	.208	3°
GM963008	R1/16	**1/8**	1/4	1/4	21/64	2-1/16	3-5/8	.216	1° 30′
GM963012	R3/32	**3/16**	3/8	3/8	29/64	2-3/8	4-3/8	.288	1° 30′
GM963016	R1/8	**1/4**	3/8	1/2	5/8	2-1/16	4-3/8	.325	1° 30′
GM963020	R5/32	**5/16**	1/2	9/16	11/16	2-1/16	4-3/4	.385	1° 30′
GM963024	R3/16	**3/8**	1/2	11/16	13/16	2-3/8	5-1/16	.458	1° 30′

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0012	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎									

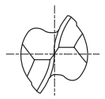
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

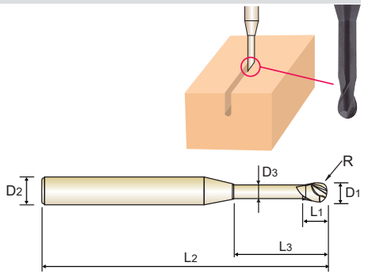
X-POWER PRO END MILLS

PLAIN SHANK **GM967 SERIES**

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- For 3-D milling, deep slotting and pocketing.
- For depths of 6 to 10X cutting diameter.
- Machine carbon steel, alloy steel, tool steel, die and mold steels.
- Suitable for high speed cutting and high precision machining.
- Designed with reinforced shank for higher stability and rigidity.
- Long neck design for deep machining near walls.





MG | 2 | 30° | R ±.0005 | PLAIN | Y Coating | p.C509

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0005)	D1	D2	L1	L3	L2	D3
GM967002	R1/64	**1/32**	1/8	3/64	7/32	2	.029
GM967901	R1/64	**1/32**	1/8	3/64	5/16	2	.029
GM967003	R3/128	**3/64**	1/8	1/16	7/32	2	.045
GM967902	R3/128	**3/64**	1/8	1/16	9/32	2	.045
GM967903	R3/128	**3/64**	1/8	1/16	1/2	2	.045
GM967004	R1/32	**1/16**	1/8	3/32	5/16	2	.060
GM967904	R1/32	**1/16**	1/8	3/32	1/2	2	.060
GM967905	R1/32	**1/16**	1/8	3/32	5/8	2	.060
GM967005	R5/128	**5/64**	1/8	1/8	5/16	2	.076
GM967906	R5/128	**5/64**	1/8	1/8	5/8	2	.076
GM967907	R5/128	**5/64**	1/8	1/8	3/4	2	.076
GM967006	R3/64	**3/32**	1/8	9/64	5/8	2	.090
GM967908	R3/64	**3/32**	1/8	9/64	3/4	2	.090
GM967008	R1/16	**1/8**	1/4	3/16	5/8	2-1/4	.120
GM967909	R1/16	**1/8**	1/4	3/16	3/4	2-1/4	.120

Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
0 ~ -.0006	0 ~ -.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

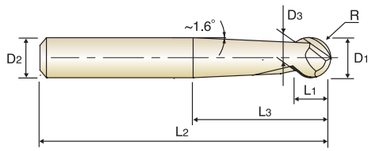
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM096 SERIES**

CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC - SPHERE TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Sphere Angle : 250°



MG | 2 | 30° | R ±.0005 | PLAIN | Y Coating | p.C510

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0005)	D1	D2	L1	L3	L2	D3
GM096008	R1/16	**1/8**	1/4	.100	1-1/4	3-1/4	.100
GM096012	R3/32	**3/16**	1/4	.150	1-1/4	3-1/4	.150
GM096016	R1/8	**1/4**	1/4	.200	1-1/8	4	.200
GM096020	R5/32	**5/16**	5/16	.250	1-3/8	4	.250
GM096024	R3/16	**3/8**	3/8	.300	1-5/8	4	.300
GM096032	R1/4	**1/2**	1/2	.400	2-3/16	4-1/4	.400
GM096040	R5/16	**5/8**	5/8	.500	2-3/4	6-1/4	.500

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-.0010	0~-.0003

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎									

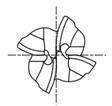
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○	○	◎	○

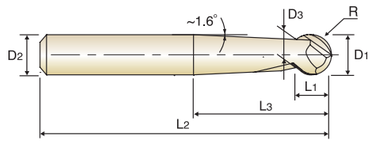
X-POWER PRO END MILLS

PLAIN SHANK **GM097 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC - SPHERE TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Sphere Angle : 250°





MG | 4 | 30° | R ±.0005 | PLAIN | Y Coating | p.C512

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0005)	D1	D2	L1	L3	L2	D3
GM097008	R1/16	**1/8**	1/4	.100	1-1/4	3-1/4	.100
GM097012	R3/32	**3/16**	1/4	.150	1-1/4	3-1/4	.150
GM097016	R1/8	**1/4**	1/4	.200	1-1/8	4	.200
GM097020	R5/32	**5/16**	5/16	.250	1-3/8	4	.250
GM097024	R3/16	**3/8**	3/8	.300	1-5/8	4	.300
GM097032	R1/4	**1/2**	1/2	.400	2-3/16	4-1/4	.400
GM097040	R5/16	**5/8**	5/8	.500	2-3/4	6-1/4	.500

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0~-.0010	0~-.0003

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	44	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	409	200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	◎									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○	○	◎	○

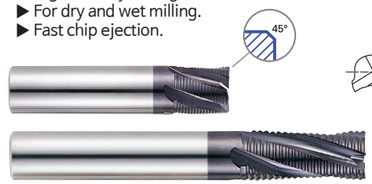
X-POWER PRO END MILLS

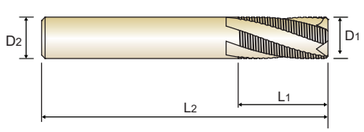
STUB LENGTH PLAIN SHANK **GM666 SERIES**

LONG LENGTH PLAIN SHANK **GM156 SERIES**

CARBIDE, MULTI FLUTE 20° HELIX STUB & LONG LENGTH FINE PITCH ROUGHING

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.





MG | FINE | 3-5 | 20° | PLAIN | Y Coating | p.C514

GM666 series - STUB LENGTH

Unit : Inch

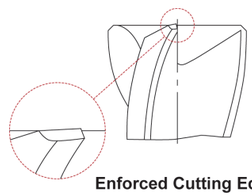
EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
	D1	D2	L1	L2		
GM666016	**1/4**	1/4	5/16	2-1/8	3	.015
GM666020	**5/16**	5/16	3/8	2-1/4	3	.015
GM666024	**3/8**	3/8	9/16	2-1/2	3	.015
GM666032	**1/2**	1/2	5/8	3	4	.024
GM666040	**5/8**	5/8	7/8	3-1/4	4	.024
GM666048	**3/4**	3/4	1	3-3/4	4	.024
GM666064	**1**	1	1	4	5	.024

GM156 series - LONG LENGTH

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute	Chamfer
	D1	D2	L1	L2		
GM156016	**1/4**	1/4	3/4	2-1/2	3	.015
GM156020	**5/16**	5/16	3/4	2-1/2	3	.015
GM156024	**3/8**	3/8	7/8	2-1/2	3	.015
GM156032	**1/2**	1/2	1	3	4	.024
GM156040	**5/8**	5/8	1-1/4	3-1/2	4	.024
GM156048	**3/4**	3/4	1-5/8	4	4	.024
GM156064	**1**	1	1-3/4	4	5	.024

Mill Dia. (inch)	Mill Dia. Tolerance(inch)	Shank Dia. Tolerance
1/4~3/8	0 ~ -.0022	0 ~ -.0003
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎										

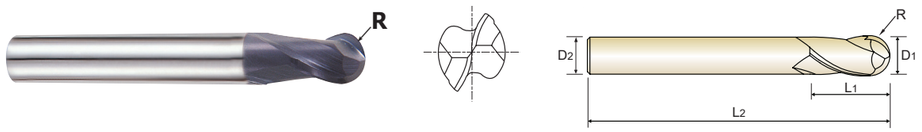
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM876 SERIES**

CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

▶ Economic type with short overall length
▶ Radius tolerance ±0.02mm & short length of cut



MG HM | 2 | 30° | R ±0.02 | PLAIN | Y Coating | p.C516

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±0.02)	D1	D2	L1	L2
GM876010	R0.5	**1.0**	3	3	38
GM876020	R1.0	**2.0**	6	3	50
GM876030	R1.5	**3.0**	6	4	50
GM876040	R2.0	**4.0**	6	5	54
GM876060	R3.0	**6.0**	6	7	54
GM876080	R4.0	**8.0**	8	9	58
GM876100	R5.0	**10.0**	10	11	66
GM876120	R6.0	**12.0**	12	12	73
GM876160	R8.0	**16.0**	16	16	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

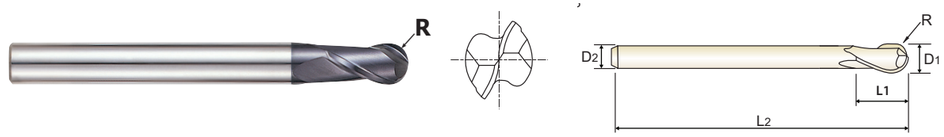
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM813 SERIES**

CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

▶ Designed to machine tool steel, alloy steel, mold steel and other high hardened materials
▶ For copy - milling machines



MG HM | 2 | 30° | R ±0.02 | PLAIN | Y Coating | p.C516

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±0.02)	D1	D2	L1	L2
GM813010	R0.5	**1.0**	4	2.5	50
GM813020	R1.0	**2.0**	6	5	50
GM813030	R1.5	**3.0**	6	8	60
GM813040	R2.0	**4.0**	6	8	70
GM813050	R2.5	**5.0**	6	10	80
GM813060	R3.0	**6.0**	6	12	90
GM813080	R4.0	**8.0**	8	14	100
GM813100	R5.0	**10.0**	10	18	100
GM813120	R6.0	**12.0**	12	22	110
GM813160	R8.0	**16.0**	16	30	140
GM813200	R10.0	**20.0**	20	38	160

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

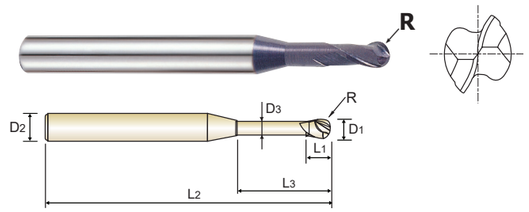
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

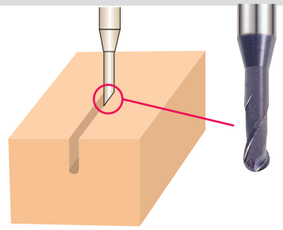
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM886** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING





MG HM | 2 | 30° | R ±0.01 | PLAIN | Y Coating | p.C518

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R(±0.01)	D1	D2	L1	L3	L2	D3
GM886005	R0.25	**0.5**	4	0.7	2	45	0.45
GM886962	R0.25	**0.5**	4	0.7	4	45	0.45
GM886957	R0.3	**0.6**	4	0.9	2	45	0.55
GM886915	R0.3	**0.6**	4	0.9	4	45	0.55
GM886916	R0.3	**0.6**	4	0.9	6	45	0.55
GM886919	R0.4	**0.8**	4	1.2	4	45	0.75
GM886008	R0.4	**0.8**	4	1.2	6	45	0.75
GM886921	R0.5	**1.0**	4	1.5	4	45	0.95
GM886923	R0.5	**1.0**	4	1.5	5	45	0.95
GM886010	R0.5	**1.0**	4	1.5	6	45	0.95
GM886902	R0.5	**1.0**	4	1.5	8	45	0.95
GM886903	R0.5	**1.0**	4	1.5	10	45	0.95
GM886904	R0.5	**1.0**	4	1.5	12	45	0.95
GM886927	R0.5	**1.0**	4	1.5	16	50	0.95
GM886012	R0.6	**1.2**	4	1.8	8	45	1.15
GM886930	R0.75	**1.5**	4	2.3	6	45	1.45
GM886015	R0.75	**1.5**	4	2.3	8	45	1.45
GM886931	R0.75	**1.5**	4	2.3	10	45	1.45
GM886906	R0.75	**1.5**	4	2.3	12	45	1.45
GM886940	R1.0	**2.0**	4	3	6	45	1.95
GM886020	R1.0	**2.0**	4	3	8	45	1.95
GM886941	R1.0	**2.0**	4	3	10	45	1.95
GM886942	R1.0	**2.0**	4	3	12	50	1.95
GM886909	R1.0	**2.0**	4	3	16	50	1.95

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.02	h6

◎ : Excellent ○ : Good

ISO	P																			M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron										
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○									

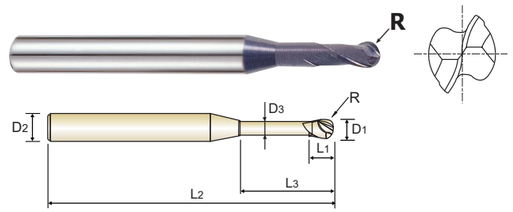
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

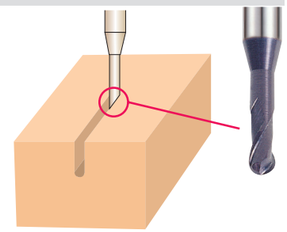
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

PLAIN SHANK **GM886** SERIES

CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING





MG HM | 2 | 30° | R ±0.01 | PLAIN | Y Coating | p.C518

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R(±0.01)	D1	D2	L1	L3	L2	D3
GM886910	R1.0	**2.0**	4	3	20	55	1.95
GM886945	R1.0	**2.0**	4	3	25	60	1.95
GM886967	R1.0	**2.0**	4	3	30	70	1.95
GM886947	R1.5	**3.0**	6	4.5	10	50	2.85
GM886948	R1.5	**3.0**	6	4.5	12	50	2.85
GM886030	R1.5	**3.0**	6	4.5	16	55	2.85
GM886911	R1.5	**3.0**	6	4.5	20	60	2.85
GM886968	R1.5	**3.0**	6	4.5	25	65	2.85
GM886040	R2.0	**4.0**	6	6	16	60	3.85
GM886912	R2.0	**4.0**	6	6	20	65	3.85
GM886913	R2.0	**4.0**	6	6	25	70	3.85
GM886971	R2.0	**4.0**	6	6	30	70	3.85
GM886972	R2.0	**4.0**	6	6	35	80	3.85
GM886050	R2.5	**5.0**	6	7.5	16	60	4.85
GM886060	R3.0	**6.0**	6	9	20	80	5.85
GM886954	R3.0	**6.0**	6	9	30	90	5.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.02	h6

◎ : Excellent ○ : Good

ISO	P																			M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron										
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○									

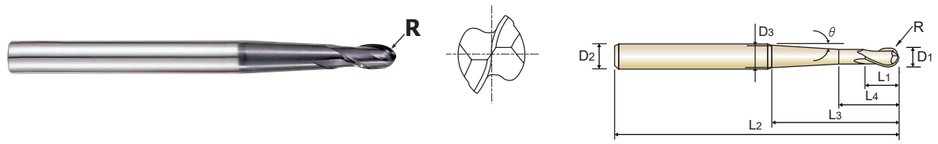
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM902 SERIES**

CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

▶ High efficiency milling in deep slotting due to long projection of the end mills



MG HM | 2 | 30° | R ±0.01 | PLAIN | Y Coating | p.C520

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Under Neck Parallel Length	Length Below Shank	Overall Length	Neck Diameter	Taper Neck Angle
	R(±0.01)	D1	D2	L1	L4	L3	L2	D3	θ
GM902010	R0.5	**1.0**	6	2	4	23	60	2	1° 30´
GM902901	R0.5	**1.0**	6	2	4	23	60	4.3	5°
GM902902	R0.5	**1.0**	6	2	4	42	80	5	3°
GM902020	R1.0	**2.0**	6	4	6	23	60	2.9	1° 30´
GM902903	R1.0	**2.0**	6	4	6	23	60	5	5°
GM902904	R1.0	**2.0**	6	4	6	41	80	5.7	3°
GM902030	R1.5	**3.0**	6	6	8	32	70	5.6	3°
GM902905	R1.5	**3.0**	6	6	8	52	90	5.3	1° 30´
GM902040	R2.0	**4.0**	6	8	10	28	70	5.9	3°
GM902906	R2.0	**4.0**	6	8	10	49	90	6	1° 30´
GM902060	R3.0	**6.0**	8	12	15	34	90	8	3°
GM902908	R3.0	**6.0**	8	12	15	53	110	8	1° 30´
GM902080	R4.0	**8.0**	10	14	17	36	100	10	3°
GM902909	R4.0	**8.0**	10	14	17	55	120	10	1° 30´

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	◎	◎	○	◎				○	○	○	○	○	○

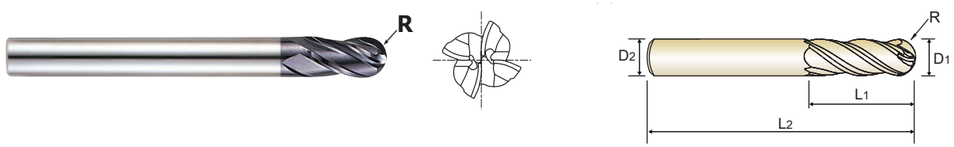
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM815 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE

▶ Designed to machine tool steels, alloy steels, mold steels and other high hardened materials
▶ For copy - milling machines
▶ 4 Flute design - higher feed than GM813 series



MG HM | 2 | 30° | R ±0.02 | PLAIN | Y Coating | p.C522

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R(±0.02)	D1	D2	L1	L2
GM815020	R1.0	**2.0**	6	5	50
GM815030	R1.5	**3.0**	6	8	60
GM815040	R2.0	**4.0**	6	8	70
GM815050	R2.5	**5.0**	6	10	80
GM815060	R3.0	**6.0**	6	12	90
GM815080	R4.0	**8.0**	8	14	100
GM815100	R5.0	**10.0**	10	18	100
GM815120	R6.0	**12.0**	12	22	110
GM815160	R8.0	**16.0**	16	30	140

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

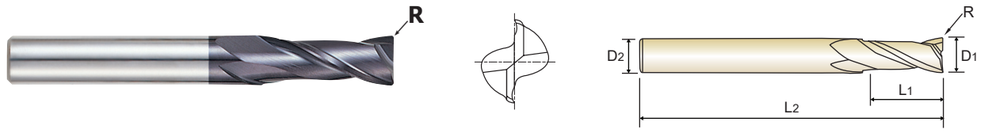
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM818 SERIES**

CARBIDE, 2 FLUTE LONG LENGTH CORNER RADIUS

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ Superior workpiece finishes
- ▶ Increased feed rates



MG HM | 2 | 30° | PLAIN | Y Coating | p.C524

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GM818911	R0.5	**4.0**	6	15	50
GM818060	R0.5	**6.0**	6	20	60
GM818901	R1.0	**6.0**	6	20	60
GM818080	R0.5	**8.0**	8	25	70
GM818902	R1.0	**8.0**	8	25	70
GM818100	R0.5	**10.0**	10	30	90
GM818905	R1.0	**10.0**	10	30	90
GM818908	R1.0	**12.0**	12	30	90

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

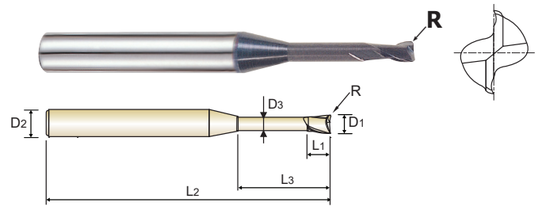
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

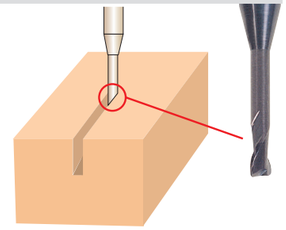
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM8A1 SERIES**

CARBIDE, 2 FLUTE CORNER RADIUS for RIB PROCESSING





MG HM | 2 | 30° | PLAIN | Y Coating | p.C525

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GM8A1010	R0.1	**1.0**	4	1.5	6	45	0.95
GM8A1920	R0.1	**1.0**	4	1.5	8	45	0.95
GM8A1921	R0.1	**1.0**	4	1.5	10	45	0.95
GM8A1012	R0.2	**1.2**	4	1.8	6	45	1.15
GM8A1015	R0.2	**1.5**	4	2.3	6	45	1.45
GM8A1937	R0.2	**1.5**	4	2.3	8	45	1.45
GM8A1938	R0.2	**1.5**	4	2.3	10	45	1.45
GM8A1939	R0.2	**1.5**	4	2.3	12	45	1.45
GM8A1941	R0.2	**1.5**	4	2.3	16	50	1.45
GM8A1018	R0.2	**1.8**	4	2.7	6	45	1.75
GM8A1960	R0.2	**2.0**	4	3	6	45	1.95
GM8A1020	R0.2	**2.0**	4	3	8	45	1.95
GM8A1962	R0.2	**2.0**	4	3	12	45	1.95
GM8A1961	R0.2	**2.0**	4	3	10	45	1.95
GM8A1964	R0.2	**2.0**	4	3	16	50	1.95
GM8A1966	R0.2	**2.0**	4	3	20	55	1.95
GM8A1967	R0.2	**2.0**	4	3	25	60	1.95
GM8A1969	R0.2	**2.5**	4	3.7	12	45	2.40
GM8A1981	R0.3	**3.0**	6	4.5	16	55	2.85
GM8A1983	R0.3	**3.0**	6	4.5	20	60	2.85
GM8A1984	R0.3	**3.0**	6	4.5	25	65	2.85
GM8A1976	R0.3	**3.0**	6	4.5	30	70	2.85
GM8A1985	R0.3	**3.0**	6	4.5	40	90	2.85
GM8A1040	R0.3	**4.0**	6	6	12	50	3.85
GM8A1986	R0.3	**4.0**	6	6	16	60	3.85
GM8A1987	R0.3	**4.0**	6	6	20	60	3.85
GM8A1060	R0.5	**6.0**	6	9	20	80	5.85
GM8A1802	R0.5	**6.0**	6	9	40	100	5.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

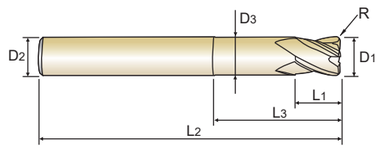
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM839 SERIES**

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ Superior workpiece finishes
- ▶ Increased feed rates



MG HM | 4 | 30° | PLAIN | Y Coating | p.C527

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R	D1	D2	L1	L3	L2	D3
GM839020	R0.2	**2.0**	6	2.5	5	50	1.9
GM839030	R0.3	**3.0**	6	4	7	50	2.8
GM839040	R0.4	**4.0**	6	5	9	50	3.7
GM839060	R0.6	**6.0**	6	7	14	55	5.6
GM839080	R0.8	**8.0**	8	10	18	60	7.4
GM839100	R1.0	**10.0**	10	12	25	70	9.4
GM839120	R1.2	**12.0**	12	15	30	80	11.4

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

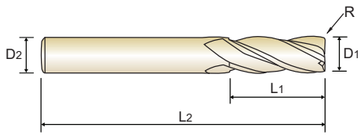
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																				◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM819 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH CORNER RADIUS

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ 4 flute allows for better workpiece finishes
- ▶ Increased production



MG HM | 4 | 30° | PLAIN | Y Coating | p.C528

Unit : mm

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GM819030	R0.3	**3.0**	6	12	50
GM819040	R0.3	**4.0**	6	15	50
GM819911	R0.5	**4.0**	6	15	50
GM819912	R0.5	**5.0**	6	20	60
GM819060	R0.5	**6.0**	6	20	60
GM819901	R1.0	**6.0**	6	20	60
GM819080	R0.5	**8.0**	8	25	70
GM819902	R1.0	**8.0**	8	25	70
GM819904	R2.0	**8.0**	8	25	70
GM819100	R0.5	**10.0**	10	30	90
GM819905	R1.0	**10.0**	10	30	90
GM819906	R1.5	**10.0**	10	30	90
GM819907	R2.0	**10.0**	10	30	90
GM819120	R0.5	**12.0**	12	30	90
GM819908	R1.0	**12.0**	12	30	90
GM819909	R1.5	**12.0**	12	30	90
GM819910	R2.0	**12.0**	12	30	90
GM819160	R0.5	**16.0**	16	50	110
GM819916	R1.0	**16.0**	16	50	110
GM819918	R2.0	**16.0**	16	50	110
GM819921	R2.0	**20.0**	20	55	110

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																				◎	○

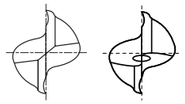
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

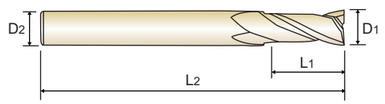
X-POWER PRO END MILLS

PLAIN SHANK **GM810 SERIES**

CARBIDE, 2 FLUTE SHORT LENGTH

▶ High precision milling in medical, optical, electronics and aerospace industries
▶ Excellent performance on hardened steel





MG HM | 2 | 30° | PLAIN | Y Coating | p.C529

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM810004	0.4	3	0.8	40
GM810005	0.5	3	1	40
GM810006	0.6	3	1.2	40
GM810007	0.7	3	1.4	40
GM810008	0.8	3	1.6	40
GM810009	0.9	3	2	40
GM810010	1.0	4	2.5	40
GM810901	1.0	6	2.5	40
GM810012	1.2	4	4	40
GM810014	1.4	4	4	40
GM810015	1.5	4	4	40
GM810902	1.5	6	4	40
GM810020	2.0	4	6	40
GM810903	2.0	6	6	40
GM810025	2.5	4	8	40
GM810030	3.0	6	8	45
GM810035	3.5	6	10	45
GM810040	4.0	6	11	45
GM810050	5.0	6	13	50
GM810060	6.0	6	13	50
GM810070	7.0	8	16	60
GM810080	8.0	8	19	60
GM810090	9.0	10	19	70
GM810100	10.0	10	22	70
GM810110	11.0	12	22	75
GM810120	12.0	12	26	75
GM810140	14.0	14	26	85
GM810160	16.0	16	32	100
GM810180	18.0	18	32	100
GM810200	20.0	20	38	105

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

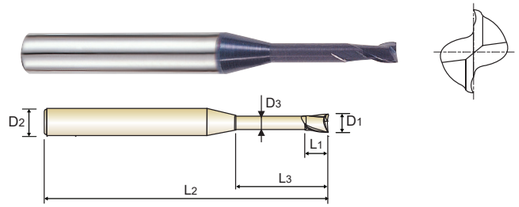
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

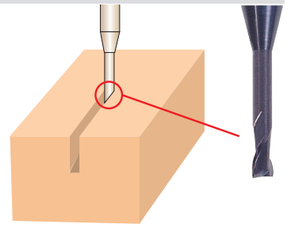
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM883 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING





MG HM | 2 | 30° | PLAIN | Y Coating | p.C530

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GM883004	0.4	4	0.6	2	45	0.37
GM883005	0.5	4	0.7	2	45	0.45
GM883988	0.5	4	0.7	4	45	0.45
GM883820	0.7	4	1	3	45	0.65
GM883008	0.8	4	1.2	4	45	0.75
GM883908	0.8	4	1.2	6	45	0.75
GM883996	1.0	4	1.5	4	45	0.95
GM883010	1.0	4	1.5	6	45	0.95
GM883912	1.0	4	1.5	8	45	0.95
GM883913	1.0	4	1.5	10	45	0.95
GM883914	1.0	4	1.5	12	45	0.95
GM883997	1.0	4	1.5	16	50	0.95
GM883998	1.0	4	1.5	20	55	0.95
GM883012	1.2	4	1.8	6	45	1.15
GM883015	1.5	4	2.3	6	45	1.45
GM883923	1.5	4	2.3	8	45	1.45
GM883924	1.5	4	2.3	10	45	1.45
GM883925	1.5	4	2.3	12	45	1.45
GM883927	1.5	4	2.3	16	50	1.45
GM883810	1.5	4	2.3	20	55	1.45
GM883946	1.8	4	2.7	12	45	1.75
GM883958	2.0	4	3	6	45	1.95
GM883020	2.0	4	3	8	45	1.95
GM883959	2.0	4	3	10	45	1.95
GM883960	2.0	4	3	12	45	1.95
GM883961	2.0	4	3	14	50	1.95

▶ NEXT PAGE

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.015	h6

◎ : Excellent ○ : Good

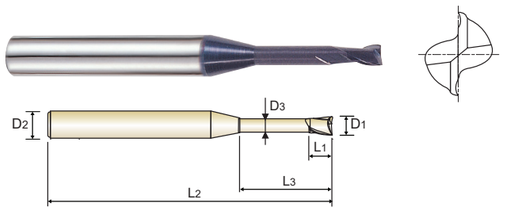
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

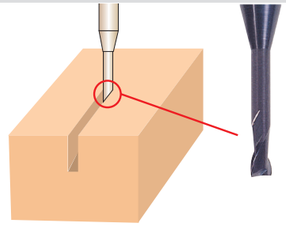
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM883 SERIES**

CARBIDE, 2 FLUTE for RIB PROCESSING





MG HM | 2 | 30° | PLAIN | Y Coating | p.C530

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3
GM883962	2.0	4	3	16	50	1.95
GM883964	2.0	4	3	20	55	1.95
GM883966	2.0	4	3	25	60	1.95
GM883814	2.0	4	3	30	70	1.95
GM883970	2.5	4	3.7	16	55	2.40
GM883975	3.0	6	4.5	10	45	2.85
GM883976	3.0	6	4.5	12	45	2.85
GM883978	3.0	6	4.5	16	55	2.85
GM883979	3.0	6	4.5	18	55	2.85
GM883980	3.0	6	4.5	20	60	2.85
GM883981	3.0	6	4.5	25	65	2.85
GM883832	3.0	6	4.5	30	70	2.85
GM883983	3.0	6	4.5	40	90	2.85
GM883801	4.0	6	6	16	60	3.85
GM883802	4.0	6	6	20	60	3.85
GM883803	4.0	6	6	25	70	3.85
GM883834	4.0	6	6	30	70	3.85
GM883836	4.0	6	6	40	90	3.85
GM883838	4.0	6	6	50	100	3.85
GM883807	6.0	6	9	30	90	5.85
GM883809	6.0	6	9	50	110	5.85

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.015	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

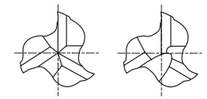
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

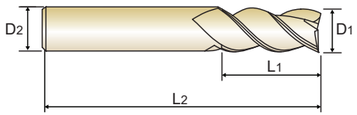
X-POWER PRO END MILLS

PLAIN SHANK **GM895 SERIES**

CARBIDE, 3 FLUTE 38° HELIX SHORT LENGTH

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- Possesses the advantage of 2 flute and 4 flute end mill
- Superior workpiece finishes





MG HM | 3 | 38° | PLAIN | Y Coating | p.C532

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM895010	1.0	3	2.5	38
GM895015	1.5	4	5	50
GM895025	2.5	3	7	38
GM895030	3.0	3	10	38
GM895901	3.0	6	10	50
GM895040	4.0	4	12	50
GM895903	4.0	6	12	50
GM895050	5.0	5	14	50
GM895904	5.0	6	14	57
GM895060	6.0	6	16	57
GM895080	8.0	8	20	63
GM895100	10.0	10	22	72
GM895120	12.0	12	25	73
GM895160	16.0	16	32	82

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

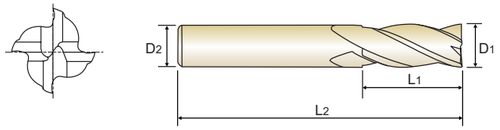
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM811 SERIES**

CARBIDE, 4 FLUTE SHORT LENGTH

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ 4 flute allows for better workpiece finishes
- ▶ Increased production



MG HM | 4 | 30° | PLAIN | Y Coating | p.C534

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM811020	2.0	4	6	40
GM811901	2.0	6	6	40
GM811025	2.5	4	8	40
GM811902	2.5	6	8	40
GM811030	3.0	6	8	45
GM811035	3.5	6	10	45
GM811040	4.0	6	11	45
GM811045	4.5	6	11	45
GM811050	5.0	6	13	50
GM811060	6.0	6	13	50
GM811080	8.0	8	19	60
GM811100	10.0	10	22	70
GM811120	12.0	12	26	75
GM811140	14.0	14	26	85
GM811160	16.0	16	32	100
GM811200	20.0	20	38	105
GM811250	25.0	25	45	120

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎	○	○	○	○	○	○	○	○	○

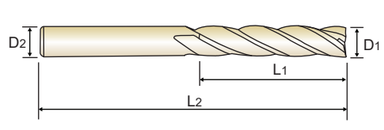
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM817 SERIES**

CARBIDE, 4 FLUTE LONG LENGTH

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ 4 flute allows for better workpiece finishes
- ▶ Increased production



MG HM | 4 | 30° | PLAIN | Y Coating | p.C535

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM817020	2.0	4	8	40
GM817030	3.0	6	12	50
GM817040	4.0	6	15	50
GM817050	5.0	6	20	60
GM817060	6.0	6	20	60
GM817080	8.0	8	25	70
GM817100	10.0	10	30	90
GM817120	12.0	12	30	90
GM817140	14.0	16	40	110
GM817160	16.0	16	50	110
GM817200	20.0	20	55	110

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

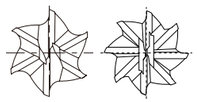
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

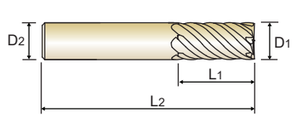
X-POWER PRO END MILLS

PLAIN SHANK **GM812** SERIES

CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH

- ▶ Designed to machine hardened materials
- ▶ High speed cutting and finish milling with high feed rates
- ▶ Superior workpiece finishes
- ▶ Superior wear resistant
- ▶ Suitable for dry milling



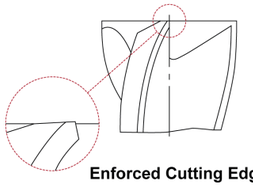


MG HM | 6&8 | 45° | PLAIN | Y Coating | p.C536

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute
GM812060	6.0	6	13	57	6
GM812080	8.0	8	19	63	6
GM812100	10.0	10	22	72	6
GM812120	12.0	12	26	83	6
GM812160	16.0	16	32	92	6
GM812200	20.0	20	38	104	8

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

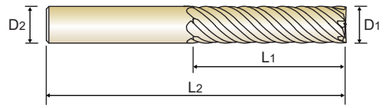
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																				◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM834** SERIES

CARBIDE, 6 FLUTE 45° HELIX EXTRA LONG LENGTH

- ▶ Designed to machine hardened materials
- ▶ High speed cutting and finish milling with high feed rates
- ▶ Superior workpiece finishes
- ▶ Superior wear resistant
- ▶ Suitable for dry milling

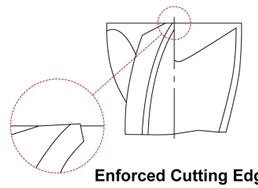


MG HM | 6 | 45° | PLAIN | Y Coating | p.C537

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2
GM834060	6.0	6	26	70
GM834080	8.0	8	36	90
GM834100	10.0	10	46	100
GM834120	12.0	12	56	110
GM834160	16.0	16	66	130
GM834200	20.0	20	76	140
GM834250	25.0	25	92	180

Mill Dia. Tolerance(mm)	Shank Dia. Tolerance
0 ~ -0.03	h6



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎				○	○	○	○	○	○

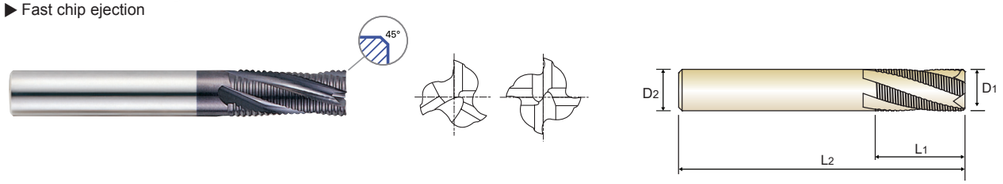
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

X-POWER PRO END MILLS

PLAIN SHANK **GM814 SERIES**

CARBIDE, MULTI FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING

- ▶ Designed to machine tool steels, alloy steels, mold steels and other hardened materials
- ▶ High velocity milling of hardened steels
- ▶ For dry and wet milling
- ▶ Fast chip ejection



MG HM | FINE | 3&4 | 20° | PLAIN | C x 45° | Y Coating

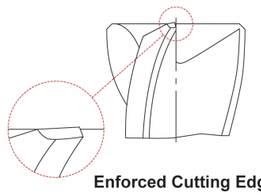
p.C538

Unit : mm

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	No. of Flute	Chamfer
GM814060	6.0	6	16	57	3	0.38
GM814080	8.0	8	16	63	3	0.38
GM814100	10.0	10	22	72	4	0.6
GM814120	12.0	12	26	83	4	0.6
GM814160	16.0	16	32	92	4	0.6
GM814200	20.0	20	38	104	4	0.6

Tolerances according to DIN 7160 & 7161

Tolerance range in ㎛					
Nominal-Diameter in ㎛					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	◎	◎	○	◎	◎	◎	○	◎			○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																		○		◎	○

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

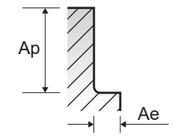
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM153 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.05D	1.0D	SFM(Vc)	210	320	340	400	380	350	395	395	365	395
					IPT(fz)	.0002	.0004	.0009	.0012	.0017	.0019	.0019	.0018	.0019	.0018
					RPM	12840	9780	6930	6110	4650	3570	3020	2410	1860	1510
					IPM(FEED)	12	14	26	29	31	26	23	18	14	11
	5		0.05D	1.0D	SFM(Vc)	135	200	205	240	225	215	240	245	230	240
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015
					RPM	8250	6110	4180	3670	2750	2190	1830	1500	1170	920
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6
	6-7	Low alloy steel	0.05D	1.0D	SFM(Vc)	210	320	340	400	380	350	395	395	365	395
					IPT(fz)	.0002	.0004	.0009	.0012	.0017	.0019	.0019	.0018	.0019	.0018
					RPM	12840	9780	6930	6110	4650	3570	3020	2410	1860	1510
					IPM(FEED)	12	14	26	29	31	26	23	18	14	11
	8-9		0.05D	1.0D	SFM(Vc)	135	200	205	240	225	215	240	245	230	240
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015
					RPM	8250	6110	4180	3670	2750	2190	1830	1500	1170	920
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6
	10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	210	320	340	400	380	350	395	395	365	395
					IPT(fz)	.0002	.0004	.0009	.0012	.0017	.0019	.0019	.0018	.0019	.0018
					RPM	12840	9780	6930	6110	4650	3570	3020	2410	1860	1510
					IPM(FEED)	12	14	26	29	31	26	23	18	14	11
	11.1-11.2		0.05D	1.0D	SFM(Vc)	135	200	205	240	225	215	240	245	230	240
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015
					RPM	8250	6110	4180	3670	2750	2190	1830	1500	1170	920
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6
M	12-14.2	Stainless steel	0.05D	1.0D	SFM(Vc)	115	165	170	205	190	180	195	190	180	195
					IPT(fz)	.0002	.0004	.0009	.0011	.0016	.0018	.0018	.0019	.0018	.0017
					RPM	7030	5040	3460	3130	2320	1830	1490	1160	920	750
					IPM(FEED)	6	7	13	14	15	13	11	9	7	5
H	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	90	120	125	145	150	145	170	160	145	155
					IPT(fz)	.0001	.0002	.0003	.0004	.0006	.0007	.0007	.0007	.0006	.0005
					RPM	5500	3670	2550	2220	1830	1480	1300	980	740	590
					IPM(FEED)	2	3	3	4	5	4	4	3	2	1
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	135	200	205	240	225	215	240	245	230	240
					IPT(fz)	.0002	.0004	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0015
					RPM	8250	6110	4180	3670	2750	2190	1830	1500	1170	920
					IPM(FEED)	7	9	16	18	17	13	11	9	7	6
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	90	120	125	145	150	145	170	160	145	155
					IPT(fz)	.0001	.0002	.0003	.0004	.0006	.0007	.0007	.0007	.0006	.0005
					RPM	5500	3670	2550	2220	1830	1480	1300	980	740	590
					IPM(FEED)	2	3	3	4	5	4	4	3	2	1



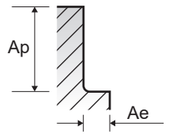
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM207 SERIES — 4 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.05D	2.0D	SFM(Vc)	160	165	190	180	180	200	210	180	195
					IPT(fz)	.0003	.0006	.0008	.0011	.0014	.0013	.0013	.0014	.0017
					RPM	4890	3360	2900	2200	1830	1530	1280	920	750
					IPM(FEED)	5	8	9	10	10	8	7	5	5
	5		0.05D	2.0D	SFM(Vc)	130	130	150	140	150	170	160	145	155
					IPT(fz)	.0003	.0006	.0009	.0011	.0013	.0013	.0014	.0013	.0016
					RPM	3970	2650	2290	1710	1530	1300	980	740	590
					IPM(FEED)	4	6	8	8	8	7	5	4	4
	6-7	Low alloy steel	0.05D	2.0D	SFM(Vc)	160	165	190	180	180	200	210	180	195
					IPT(fz)	.0003	.0006	.0008	.0011	.0014	.0013	.0013	.0014	.0017
					RPM	4890	3360	2900	2200	1830	1530	1280	920	750
					IPM(FEED)	5	8	9	10	10	8	7	5	5
	8-9		0.05D	2.0D	SFM(Vc)	130	130	150	140	150	170	160	145	155
					IPT(fz)	.0003	.0006	.0009	.0011	.0013	.0013	.0014	.0013	.0016
					RPM	3970	2650	2290	1710	1530	1300	980	740	590
					IPM(FEED)	4	6	8	8	8	7	5	4	4
	10	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	160	165	190	180	180	200	210	180	195
					IPT(fz)	.0003	.0006	.0008	.0011	.0014	.0013	.0013	.0014	.0017
					RPM	4890	3360	2900	2200	1830	1530	1280	920	750
					IPM(FEED)	5	8	9	10	10	8	7	5	5
	11.1-11.2		0.05D	2.0D	SFM(Vc)	130	130	150	140	150	170	160	145	155
					IPT(fz)	.0003	.0006	.0009	.0011	.0013	.0013	.0014	.0013	.0016
					RPM	3970	2650	2290	1710	1530	1300	980	740	590
					IPM(FEED)	4	6	8	8	8	7	5	4	4
H	38.1-38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	80	85	100	95	90	100	100	90	95
					IPT(fz)	.0002	.0004	.0006	.0008	.0011	.0010	.0011	.0011	.0014
					RPM	2450	1730	1530	1160	920	760	610	460	360
					IPM(FEED)	2	3	4	4	4	3	3	2	2
	40	Chilled Cast Iron	0.05D	2.0D	SFM(Vc)	130	130	150	140	150	170	160	145	155
					IPT(fz)	.0003	.0006	.0009	.0011	.0013	.0013	.0014	.0013	.0016
					RPM	3970	2650	2290	1710	1530	1300	980	740	590
					IPM(FEED)	4	6	8	8	8	7	5	4	4
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	80	85	100	95	90	100	100	90	95
					IPT(fz)	.0002	.0004	.0006	.0008	.0011	.0010	.0011	.0011	.0014
					RPM	2450	1730	1530	1160	920	760	610	460	360
					IPM(FEED)	2	3	4	4	4	3	3	2	2



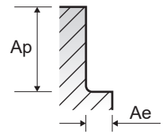
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM639, GM649, GM212 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2
P	1-4	Non-alloy steel	0.05D	2.5D	SFM(Vc)	190	180	180	200
					IPT(fz)	.0008	.0011	.0013	.0013
					RPM	2900	2200	1830	1530
					IPM(FEED)	9	10	10	8
	5		0.05D	2.5D	SFM(Vc)	150	140	150	170
					IPT(fz)	.0009	.0011	.0013	.0013
					RPM	2290	1710	1530	1300
					IPM(FEED)	8	8	8	7
	6-7	Low alloy steel	0.05D	2.5D	SFM(Vc)	190	180	180	200
					IPT(fz)	.0008	.0011	.0013	.0013
					RPM	2900	2200	1830	1530
					IPM(FEED)	9	10	10	8
	8-9		0.05D	2.5D	SFM(Vc)	150	140	150	170
					IPT(fz)	.0009	.0011	.0013	.0013
					RPM	2290	1710	1530	1300
					IPM(FEED)	8	8	8	7
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	190	180	180	200
					IPT(fz)	.0008	.0011	.0013	.0013
					RPM	2900	2200	1830	1530
					IPM(FEED)	9	10	10	8
	11.1-11.2		0.05D	2.5D	SFM(Vc)	150	140	150	170
					IPT(fz)	.0009	.0011	.0013	.0013
					RPM	2290	1710	1530	1300
					IPM(FEED)	8	8	8	7
H	38.1	Hardened steel	0.05D	2.5D	SFM(Vc)	150	140	150	170
					IPT(fz)	.0009	.0011	.0013	.0013
					RPM	2290	1710	1530	1300
					IPM(FEED)	8	8	8	7
	38.2	Hardened steel	0.02D	2.5D	SFM(Vc)	100	95	90	100
					IPT(fz)	.0006	.0008	.0010	.0010
					RPM	1530	1160	920	760
					IPM(FEED)	4	4	4	3
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	150	140	150	170
					IPT(fz)	.0009	.0011	.0013	.0013
					RPM	2290	1710	1530	1300
					IPM(FEED)	8	8	8	7
	41	Hardened Cast Iron	0.02D	2.5D	SFM(Vc)	100	95	90	100
					IPT(fz)	.0006	.0008	.0010	.0010
					RPM	1530	1160	920	760
					IPM(FEED)	4	4	4	3



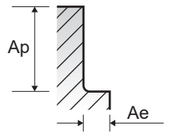
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM103 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/8	1/2	5/8	3/4	7/8
P	1-4	Non-alloy steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0026	.0034	.0038	.0039	.0039
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	87	87	78	66	56
	5		0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	53	53	53	53	53
	6-7	Low alloy steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0026	.0034	.0038	.0039	.0039
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	87	87	78	66	56
	8-9		0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	53	53	53	53	53
	10	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0026	.0034	.0038	.0039	.0039
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	87	87	78	66	56
	11.1-11.2		0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	53	53	53	53	53
M	12-14.2	Hardened steel	0.05D	1.5D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	40	40	40	40	40
K	38.1-38.2	Hardened steel	0.05D	1.5D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0013	.0017	.0021	.0025	.0030
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	32	32	32	32	32
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	830	830	830	830	830
					IPT(fz)	.0016	.0021	.0026	.0031	.0036
					RPM	8460	6340	5070	4230	3620
					IPM(FEED)	53	53	53	53	53
	41	Hardened Cast Iron	0.05D	1.5D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0013	.0017	.0021	.0025	.0030
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	32	32	32	32	32



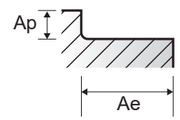
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM103 SERIES — 4 FLUTE CORNER RADIUS - CONTOURING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/8	1/2	5/8	3/4	7/8
P	1-4	Non-alloy steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830
					IPT(fz)	.0015	.0020	.0024	.0023	.0034
					RPM	8460	6340	5070	5350	3620
					IPM(FEED)	50	50	50	50	50
	5		0.3D ~ 0.5D	0.1D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	40	40	40	40	40
	6-7	Low alloy steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830
					IPT(fz)	.0015	.0020	.0024	.0023	.0034
					RPM	8460	6340	5070	5350	3620
					IPM(FEED)	50	50	50	50	50
	8-9		0.3D ~ 0.5D	0.1D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	40	40	40	40	40
	10	High alloyed steel, and tool steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	830	830	830	1050	830
					IPT(fz)	.0015	.0020	.0024	.0023	.0034
					RPM	8460	6340	5070	5350	3620
					IPM(FEED)	50	50	50	50	50
	11.1-11.2		0.3D ~ 0.5D	0.1D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	40	40	40	40	40
M	12-14.2	Hardened steel	0.3D ~ 0.5D	0.1D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0014	.0018	.0023	.0027	.0032
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	34	34	34	34	34
K	38.1-38.2	Hardened steel	0.2D ~ 0.3D	0.05D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0008	.0011	.0013	.0016	.0019
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	20	20	20	20	20
	40	Chilled Cast Iron	0.2D ~ 0.3D	0.1D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0016	.0021	.0026	.0032	.0037
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	40	40	40	40	40
	41	Hardened Cast Iron	0.2D ~ 0.3D	0.05D	SFM(Vc)	615	615	615	615	610
					IPT(fz)	.0008	.0011	.0013	.0016	.0019
					RPM	6270	4700	3760	3130	2660
					IPM(FEED)	20	20	20	20	20



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM208 SERIES — 6&8 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(NORMAL SPEED)

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.1D	1.5D	SFM(Vc)	370	350	335	380	350	335	340
					IPT(fz)	.0024	.0031	.0039	.0039	.0040	.0030	.0025
					RPM	5650	4280	3410	2900	2140	1710	1300
					IPM(FEED)	81	81	81	67	51	41	26
	5		0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235
					IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025
					RPM	3970	2990	2390	2020	1500	1170	900
					IPM(FEED)	55	55	55	47	36	28	18
	6-7	Low alloy steel	0.1D	1.5D	SFM(Vc)	370	350	335	380	350	335	340
					IPT(fz)	.0024	.0031	.0039	.0039	.0040	.0030	.0025
					RPM	5650	4280	3410	2900	2140	1710	1300
					IPM(FEED)	81	81	81	67	51	41	26
	8-9		0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235
					IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025
					RPM	3970	2990	2390	2020	1500	1170	900
					IPM(FEED)	55	55	55	47	36	28	18
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	370	350	335	380	350	335	340
					IPT(fz)	.0024	.0031	.0039	.0039	.0040	.0030	.0025
					RPM	5650	4280	3410	2900	2140	1710	1300
					IPM(FEED)	81	81	81	67	51	41	26
	11.1-11.2		0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235
					IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025
					RPM	3970	2990	2390	2020	1500	1170	900
					IPM(FEED)	55	55	55	47	36	28	18
H	38.1	Hardened steel	0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235
					IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025
					RPM	3970	2990	2390	2020	1500	1170	900
					IPM(FEED)	55	55	55	47	36	28	18
	38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	105	95	100	115	105	100	100
					IPT(fz)	.0009	.0012	.0014	.0014	.0014	.0011	.0010
					RPM	1600	1160	1020	880	640	510	380
					IPM(FEED)	9	9	9	7	5	5	3
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	260	245	235	265	245	230	235
					IPT(fz)	.0023	.0031	.0038	.0039	.0040	.0029	.0025
					RPM	3970	2990	2390	2020	1500	1170	900
					IPM(FEED)	55	55	55	47	36	28	18
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	105	95	100	115	105	100	100
					IPT(fz)	.0009	.0012	.0014	.0014	.0014	.0011	.0010
					RPM	1600	1160	1020	880	640	510	380
					IPM(FEED)	9	9	9	7	5	5	3

(HIGH SPEED)

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1010	1015
					IPT(fz)	.0024	.0032	.0039	.0040	.0039	.0030	.0025
					RPM	17110	12840	10190	8560	6420	5140	3880
					IPM(FEED)	245	245	240	203	152	122	77
H	38.1	Hardened steel	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1010	1015
					IPT(fz)	.0024	.0032	.0039	.0040	.0039	.0030	.0025
					RPM	17110	12840	10190	8560	6420	5140	3880
					IPM(FEED)	245	245	240	203	152	122	77
	38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	560	525	505	560	525	505	505
					IPT(fz)	.0024	.0032	.0040	.0040	.0040	.0029	.0025
					RPM	8560	6420	5140	4280	3210	2570	1930
					IPM(FEED)	122	122	122	102	77	59	39
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1010	1015
					IPT(fz)	.0024	.0032	.0039	.0040	.0039	.0030	.0025
					RPM	17110	12840	10190	8560	6420	5140	3880
					IPM(FEED)	245	245	240	203	152	122	77
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	560	525	505	560	525	505	505
					IPT(fz)	.0024	.0032	.0040	.0040	.0040	.0029	.0025
					RPM	8560	6420	5140	4280	3210	2570	1930
					IPM(FEED)	122	122	122	102	77	59	39

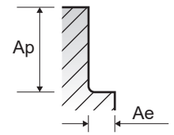
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM218 SERIES — 6&8 FLUTE SQUARE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-9	Non-alloy steel Low alloy steel	0.01D	3.0D	SFM(Vc)	150	140	135	150	140	135	145
					IPT(fz)	.0014	.0018	.0021	.0024	.0026	.0020	.0022
					RPM	2290	1710	1380	1150	860	690	550
					IPM(FEED)	19	18	17	16	13	11	10
	10-11.1	High alloyed steel, and tool steel	0.05D	3.0D	SFM(Vc)	150	140	135	150	140	135	145
					IPT(fz)	.0014	.0018	.0021	.0024	.0026	.0020	.0022
					RPM	2290	1710	1380	1150	860	690	550
					IPM(FEED)	19	18	17	16	13	11	10
	11.2		0.01D	3.0D	SFM(Vc)	110	105	100	115	105	100	105
					IPT(fz)	.0014	.0017	.0020	.0021	.0024	.0020	.0021
					RPM	1680	1280	1020	880	640	510	400
					IPM(FEED)	14	13	12	11	9	8	7
H	38.1	Hardened steel	0.01D	3.0D	SFM(Vc)	110	105	100	115	105	100	105
					IPT(fz)	.0014	.0017	.0020	.0021	.0024	.0020	.0021
					RPM	1680	1280	1020	880	640	510	400
					IPM(FEED)	14	13	12	11	9	8	7
	38.2	Hardened steel	0.05D	3.0D	SFM(Vc)	95	90	85	90	90	85	90
					IPT(fz)	.0012	.0015	.0018	.0021	.0020	.0018	.0019
					RPM	1450	1100	870	690	550	430	340
					IPM(FEED)	10	10	9	9	7	6	5
	40	Chilled Cast Iron	0.01D	3.0D	SFM(Vc)	110	105	100	115	105	100	105
					IPT(fz)	.0014	.0017	.0020	.0021	.0024	.0020	.0021
					RPM	1680	1280	1020	880	640	510	400
					IPM(FEED)	14	13	12	11	9	8	7
	41	Hardened Cast Iron	0.05D	3.0D	SFM(Vc)	95	90	85	90	90	85	90
					IPT(fz)	.0012	.0015	.0018	.0021	.0020	.0018	.0019
					RPM	1450	1100	870	690	550	430	340
					IPM(FEED)	10	10	9	9	7	6	5



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

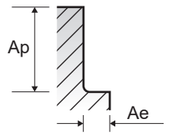
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM668 SERIES — 6&8 FLUTE CORNER RADIUS - SIDE CUTTING

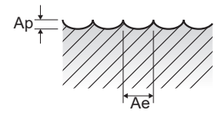
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1000
					IPT(fz)	.0024	.0032	.0039	.0040	.0040	.0030
					RPM	17110	12840	10190	8560	6420	5090
					IPM(FEED)	245	245	240	204	153	122
H	38.1	Hardened steel	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1000
					IPT(fz)	.0024	.0032	.0039	.0040	.0040	.0030
					RPM	17110	12840	10190	8560	6420	5090
					IPM(FEED)	245	245	240	204	153	122
	38.2		0.05D	1.5D	SFM(Vc)	560	525	500	560	525	500
					IPT(fz)	.0024	.0032	.0040	.0040	.0040	.0029
					RPM	8560	6420	5090	4280	3210	2550
					IPM(FEED)	122	122	122	102	77	59
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1120	1050	1000	1120	1050	1000
					IPT(fz)	.0024	.0032	.0039	.0040	.0040	.0030
					RPM	17110	12840	10190	8560	6420	5090
					IPM(FEED)	245	245	240	204	153	122
	41	Hardened Cast Iron	0.05D	1.5D	SFM(Vc)	560	525	500	560	525	500
					IPT(fz)	.0024	.0032	.0040	.0040	.0040	.0029
					RPM	8560	6420	5090	4280	3210	2550
					IPM(FEED)	122	122	122	102	77	59



X-POWER PRO END MILLS
RECOMMENDED CUTTING CONDITIONS

GM209 SERIES — 2 FLUTE BALL NOSE - PROFILING



SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(NORMAL SPEED)

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4
P	1-4	Non-alloy steel	0.2D	SFM(Vc)	140	285	390	470	495	560	475	500	545	490	455
				IPT(fz)	.0003	.0004	.0010	.0010	.0018	.0021	.0036	.0043	.0047	.0066	.0078
				RPM	17110	17420	15890	14360	10090	8560	5810	5090	4160	3000	2320
				IPM(FEED)	11	15	33	29	36	36	41	44	39	40	36
	5		0.2D	SFM(Vc)	115	220	290	360	395	455	400	410	425	415	410
				IPT(fz)	.0003	.0004	.0009	.0009	.0016	.0020	.0029	.0037	.0044	.0056	.0066
				RPM	14060	13450	11820	11000	8050	6950	4890	4180	3250	2540	2090
				IPM(FEED)	9	12	21	20	25	27	29	31	29	29	28
	6-7	Low alloy steel	0.2D	SFM(Vc)	140	285	390	470	495	560	475	500	545	490	455
				IPT(fz)	.0003	.0004	.0010	.0010	.0018	.0021	.0036	.0043	.0047	.0066	.0078
				RPM	17110	17420	15890	14360	10090	8560	5810	5090	4160	3000	2320
				IPM(FEED)	11	15	33	29	36	36	41	44	39	40	36
	8-9		0.2D	SFM(Vc)	115	220	290	360	395	455	400	410	425	415	410
				IPT(fz)	.0003	.0004	.0009	.0009	.0016	.0020	.0029	.0037	.0044	.0056	.0066
				RPM	14060	13450	11820	11000	8050	6950	4890	4180	3250	2540	2090
				IPM(FEED)	9	12	21	20	25	27	29	31	29	29	28
	10	High alloyed steel, and tool steel	0.2D	SFM(Vc)	140	285	390	470	495	560	475	500	545	490	455
				IPT(fz)	.0003	.0004	.0010	.0010	.0018	.0021	.0036	.0043	.0047	.0066	.0078
				RPM	17110	17420	15890	14360	10090	8560	5810	5090	4160	3000	2320
				IPM(FEED)	11	15	33	29	36	36	41	44	39	40	36
	11.1-11.2		0.2D	SFM(Vc)	115	220	290	360	395	455	400	410	425	415	410
				IPT(fz)	.0003	.0004	.0009	.0009	.0016	.0020	.0029	.0037	.0044	.0056	.0066
				RPM	14060	13450	11820	11000	8050	6950	4890	4180	3250	2540	2090
				IPM(FEED)	9	12	21	20	25	27	29	31	29	29	28
H	38.1-38.2	Hardened steel	0.1D	SFM(Vc)	50	95	125	165	200	230	190	190	195	210	180
				IPT(fz)	.0003	.0004	.0006	.0006	.0010	.0012	.0018	.0021	.0028	.0032	.0045
				RPM	6110	5810	5090	5040	4080	3510	2320	1940	1490	1280	920
				IPM(FEED)	4	5	7	7	8	8	8	8	8	8	8
	40	Chilled Cast Iron	0.1D	SFM(Vc)	115	220	290	360	395	455	400	410	425	415	410
				IPT(fz)	.0003	.0004	.0009	.0009	.0016	.0020	.0029	.0037	.0044	.0056	.0066
				RPM	14060	13450	11820	11000	8050	6950	4890	4180	3250	2540	2090
				IPM(FEED)	9	12	21	20	25	27	29	31	29	29	28
	41	Hardened Cast Iron	0.1D	SFM(Vc)	50	95	125	165	200	230	190	190	195	210	180
				IPT(fz)	.0003	.0004	.0006	.0006	.0010	.0012	.0018	.0021	.0028	.0032	.0045
				RPM	6110	5810	5090	5040	4080	3510	2320	1940	1490	1280	920
				IPM(FEED)	4	5	7	7	8	8	8	8	8	8	8

(HIGH SPEED)

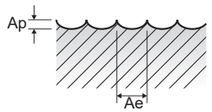
ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.05D	SFM(Vc)	225	415	565	755	1135	1510	1420	1475	1510	1475	1360
				IPT(fz)	.0005	.0006	.0008	.0009	.0017	.0022	.0035	.0044	.0049	.0063	.0079
				RPM	27500	25370	23020	23070	23120	23070	17360	15030	11540	9020	6930
				IPM(FEED)	28	30	38	43	78	100	123	132	114	114	109
H	38.1-38.2	Hardened steel	0.05D	SFM(Vc)	225	415	515	610	650	755	710	680	760	680	635
				IPT(fz)	.0003	.0004	.0005	.0006	.0010	.0012	.0018	.0026	.0031	.0037	.0035
				RPM	27500	25370	20990	18640	13240	11540	8680	6930	5810	4160	3230
				IPM(FEED)	17	19	21	23	26	27	32	36	36	31	23
	40-41	Chilled Cast Iron Hardened Cast Iron	0.05D	SFM(Vc)	225	415	515	610	650	755	710	680	760	680	635
				IPT(fz)	.0003	.0004	.0005	.0006	.0010	.0012	.0018	.0026	.0031	.0037	.0035
				RPM	27500	25370	20990	18640	13240	11540	8680	6930	5810	4160	3230
				IPM(FEED)	17	19	21	23	26	27	32	36	36	31	23

Ap
D3/16~D1/4 = .008
D5/16~D3/4 = .012

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM210 SERIES — 4 FLUTE BALL NOSE - PROFILING



SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(NORMAL SPEED)

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8
P	1-4	Non-alloy steel	0.2D	SFM(Vc)	470	495	560	475	500	545	490
				IPT(fz)	.0008	.0013	.0016	.0027	.0032	.0035	.0050
				RPM	14360	10090	8560	5810	5090	4160	3000
				IPM(FEED)	44	53	55	62	66	58	60
	5		0.2D	SFM(Vc)	360	395	455	400	410	425	415
				IPT(fz)	.0007	.0012	.0015	.0022	.0028	.0033	.0042
				RPM	11000	8050	6950	4890	4180	3250	2540
				IPM(FEED)	30	37	41	43	46	43	42
	6-7	Low alloy steel	0.2D	SFM(Vc)	470	495	560	475	500	545	490
				IPT(fz)	.0008	.0013	.0016	.0027	.0032	.0035	.0050
				RPM	14360	10090	8560	5810	5090	4160	3000
				IPM(FEED)	44	53	55	62	66	58	60
	8-9		0.2D	SFM(Vc)	360	395	455	400	410	425	415
				IPT(fz)	.0007	.0012	.0015	.0022	.0028	.0033	.0042
				RPM	11000	8050	6950	4890	4180	3250	2540
				IPM(FEED)	30	37	41	43	46	43	42
	10	High alloyed steel, and tool steel	0.2D	SFM(Vc)	470	495	560	475	500	545	490
				IPT(fz)	.0008	.0013	.0016	.0027	.0032	.0035	.0050
				RPM	14360	10090	8560	5810	5090	4160	3000
				IPM(FEED)	44	53	55	62	66	58	60
	11.1-11.2		0.2D	SFM(Vc)	360	395	455	400	410	425	415
				IPT(fz)	.0007	.0012	.0015	.0022	.0028	.0033	.0042
				RPM	11000	8050	6950	4890	4180	3250	2540
				IPM(FEED)	30	37	41	43	46	43	42
H	38.1-38.2	Hardened steel	0.1D	SFM(Vc)	165	200	230	190	190	195	210
				IPT(fz)	.0005	.0007	.0009	.0013	.0016	.0021	.0024
				RPM	5040	4080	3510	2320	1940	1490	1280
				IPM(FEED)	10	12	12	12	12	12	12
	40	Chilled Cast Iron	0.2D	SFM(Vc)	360	395	455	400	410	425	415
				IPT(fz)	.0007	.0012	.0015	.0022	.0028	.0033	.0042
				RPM	11000	8050	6950	4890	4180	3250	2540
				IPM(FEED)	30	37	41	43	46	43	42
	41	Hardened Cast Iron	0.1D	SFM(Vc)	165	200	230	190	190	195	210
				IPT(fz)	.0005	.0007	.0009	.0013	.0016	.0021	.0024
				RPM	5040	4080	3510	2320	1940	1490	1280
				IPM(FEED)	10	12	12	12	12	12	12

AP	~HRc45	HRc45~55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012

(HIGH SPEED)

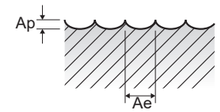
ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.05D	SFM(Vc)	755	1135	1510	1420	1475	1510	1475
				IPT(fz)	.0007	.0013	.0016	.0027	.0033	.0037	.0047
				RPM	23070	23120	23070	17360	15030	11540	9020
				IPM(FEED)	65	117	150	184	198	171	171
H	38.1-38.2	Hardened steel	0.05D	SFM(Vc)	610	650	755	710	680	760	680
				IPT(fz)	.0005	.0007	.0009	.0014	.0020	.0023	.0028
				RPM	18640	13240	11540	8680	6930	5810	4160
				IPM(FEED)	34	39	41	48	55	55	46
	40-41	Chilled Cast Iron Hardened Cast Iron	0.05D	SFM(Vc)	610	650	755	710	680	760	680
				IPT(fz)	.0005	.0007	.0009	.0014	.0020	.0023	.0028
				RPM	18640	13240	11540	8680	6930	5810	4160
				IPM(FEED)	34	39	41	48	55	55	46

AP	~HRc55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM961 SERIES — 2 FLUTE BALL NOSE - PROFILING



SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(NORMAL SPEED)

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.2D	SFM(Vc)	360	395	455	400	410	425	415	410	435
				IPT(fz)	.0009	.0016	.0020	.0029	.0037	.0044	.0056	.0066	.0083
				RPM	11000	8050	6950	4890	4180	3250	2540	2090	1660
				IPM(FEED)	20	25	27	29	31	29	29	28	28
H	38.1	Hardened steel	0.1D	SFM(Vc)	455	510	620	630	655	785	785	755	805
				IPT(fz)	.0017	.0023	.0026	.0029	.0032	.0036	.0039	.0039	.0049
				RPM	13910	10390	9470	7700	6670	6000	4800	3850	3080
				IPM(FEED)	48	48	50	45	43	43	38	30	30
	38.2		0.1D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0017	.0023	.0026	.0029	.0033	.0036	.0039	.0039	.0048
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	45	45	48	43	42	42	36	28	28
	40	Chilled Cast Iron	0.2D	SFM(Vc)	360	395	455	400	410	425	415	410	435
				IPT(fz)	.0009	.0016	.0020	.0029	.0037	.0044	.0056	.0066	.0083
				RPM	11000	8050	6950	4890	4180	3250	2540	2090	1660
				IPM(FEED)	20	25	27	29	31	29	29	28	28
	41	Hardened Cast Iron	0.1D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0017	.0023	.0026	.0029	.0033	.0036	.0039	.0039	.0048
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	45	45	48	43	42	42	36	28	28

AP	~HRc45	HRc45~55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012	D1/8 = .006 D3/16 ~ D5/16 = .010 D3/8 ~ D1 = .012

(HIGH SPEED)

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steel	0.05D	SFM(Vc)	755	1135	1510	1420	1475	1510	1475	1360	1450
				IPT(fz)	.0009	.0017	.0022	.0035	.0044	.0049	.0063	.0079	.0098
				RPM	23070	23120	23070	17360	15030	11540	9020	6930	5540
				IPM(FEED)	43	78	100	123	132	114	114	109	109
H	38.1	Hardened steel	0.05D	SFM(Vc)	455	510	620	630	655	785	785	755	805
				IPT(fz)	.0027	.0034	.0040	.0044	.0047	.0051	.0055	.0056	.0070
				RPM	13910	10390	9470	7700	6670	6000	4800	3850	3080
				IPM(FEED)	76	72	76	67	63	62	53	43	43
	38.2		0.05D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0027	.0034	.0040	.0043	.0046	.0050	.0053	.0053	.0067
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	72	68	72	63	59	58	49	39	39
	40	Chilled Cast Iron	0.05D	SFM(Vc)	755	1135	1510	1420	1475	1510	1475	1360	1450
				IPT(fz)	.0009	.0017	.0022	.0035	.0044	.0049	.0063	.0079	.0098
				RPM	23070	23120	23070	17360	15030	11540	9020	6930	5540
				IPM(FEED)	43	78	100	123	132	114	114	109	109
	41	Hardened Cast Iron	0.05D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0027	.0034	.0040	.0043	.0046	.0050	.0053	.0053	.0067
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	72	68	72	63	59	58	49	39	39

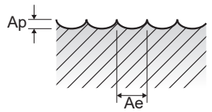
AP	~HRc45	HRc45~55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012	D1/8 = .006 D3/16 ~ D5/16 = .010 D3/8 ~ D1 = .012

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM960 SERIES — 2 FLUTE BALL NOSE - PROFILING



SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

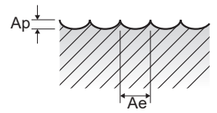
ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) .024	.031	.040	.047	.062
P	5, 8-9, 11.1-11.2	Non-alloy steel Low alloy steel High alloyed steel, and tool steela	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0004	.0005	.0005	.0005	.0006
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	25	27	27	28	29
H	38.1-38.2	Hardened steel	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0002	.0003	.0003	.0003	.0004
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	12	16	17	17	18
	40	Chilled Cast Iron	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0004	.0005	.0005	.0005	.0006
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	25	27	27	28	29
	41	Hardened Cast Iron	SFM(Vc)	200	230	275	310	390
			IPT(fz)	.0002	.0003	.0003	.0003	.0004
			RPM	31830	28340	26260	25200	24030
			IPM(FEED)	12	16	17	17	18

HRc30~HRc45		HRc45~HRc55	
D<.040	D≥.040	D<.040	D≥.040
Ae = 0.15xD **Ap** = 0.05xD	**Ae** = 0.15xD **Ap** = 0.75xD	**Ae** = 0.1xD **Ap** = 0.05xD	**Ae** = 0.15xD **Ap** = 0.05xD

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM109 SERIES — 2 FLUTE BALL NOSE - PROFILING



SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(NORMAL SPEED)

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
H	38.1	Hardened steel	0.1D	SFM(Vc)	455	510	620	630	655	785	785	755	805
				IPT(fz)	.0017	.0023	.0026	.0029	.0032	.0036	.0039	.0039	.0049
				RPM	13910	10390	9470	7700	6670	6000	4800	3850	3080
				IPM(FEED)	48	48	50	45	43	43	38	30	30
	38.2		0.1D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0017	.0023	.0026	.0029	.0033	.0036	.0039	.0039	.0048
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	45	45	48	43	42	42	36	28	28
	41	Hardened Cast Iron	0.1D	SFM(Vc)	445	490	595	605	625	750	750	715	765
				IPT(fz)	.0017	.0023	.0026	.0029	.0033	.0036	.0039	.0039	.0048
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2920
				IPM(FEED)	45	45	48	43	42	42	36	28	28

(HIGH SPEED)

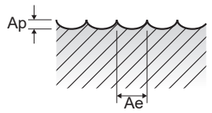
ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
H	38.1	Hardened steel	0.05D	SFM(Vc)	455	510	620	630	655	785	785	755	805
				IPT(fz)	.0027	.0034	.0040	.0044	.0047	.0051	.0055	.0056	.0070
				RPM	13910	10390	9470	7700	6670	6000	4800	3850	3080
				IPM(FEED)	76	72	76	67	63	62	53	43	43
	38.2		0.05D	SFM(Vc)	445	490	595	605	625	750	750	715	760
				IPT(fz)	.0027	.0034	.0040	.0043	.0046	.0050	.0053	.0053	.0067
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2900
				IPM(FEED)	72	68	72	63	59	58	49	39	39
	41	Hardened Cast Iron	0.05D	SFM(Vc)	445	490	595	605	625	750	750	715	760
				IPT(fz)	.0027	.0034	.0040	.0043	.0046	.0050	.0053	.0053	.0067
				RPM	13600	9980	9090	7400	6370	5730	4580	3640	2900
				IPM(FEED)	72	68	72	63	59	58	49	39	39

Ap
D1/8 = .006
D3/16~D5/16 = .010
D3/8~D1 = .012

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM963 SERIES — 2 FLUTE BALL NOSE - PROFILING



SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(NORMAL SPEED)

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/16	1/8	3/16	1/4	5/16	3/8	1/2
P	1-11.2	Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel	0.2D	SFM(Vc)	175	290	315	365	320	325	340
				IPT(fz)	.0004	.0009	.0016	.0019	.0029	.0037	.0044
				RPM	10700	8860	6420	5580	3910	3310	2600
				IPM(FEED)	9	16	20	22	23	25	23
H	38.1	Hardened steel	0.1D	SFM(Vc)	250	365	405	495	505	525	625
				IPT(fz)	.0007	.0017	.0023	.0026	.0029	.0032	.0036
				RPM	15280	11150	8250	7560	6170	5350	4780
				IPM(FEED)	22	38	38	40	36	35	35
	38.2		0.1D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0007	.0017	.0023	.0027	.0030	.0032	.0036
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	20	37	37	38	35	33	33
	40	Chilled Cast Iron	0.2D	SFM(Vc)	175	290	315	365	320	325	340
				IPT(fz)	.0004	.0009	.0016	.0019	.0029	.0037	.0044
				RPM	10700	8860	6420	5580	3910	3310	2600
				IPM(FEED)	9	16	20	22	23	25	23
	41	Hardened Cast Iron	0.1D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0007	.0017	.0023	.0027	.0030	.0032	.0036
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	20	37	37	38	35	33	33

AP	~HRc45	HRc45~55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012	D1/8 = .006 D3/16 ~ D5/16 = .010 D3/8 ~ D1 = .012

(HIGH SPEED)

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1/16	1/8	3/16	1/4	5/16	3/8	1/2
P	1-11.2	Non-alloy steel, Low alloy steel, High alloyed steel, and tool steel	0.05D	SFM(Vc)	330	605	905	1210	1135	1180	1210
				IPT(fz)	.0006	.0009	.0017	.0022	.0035	.0044	.0049
				RPM	20170	18490	18440	18490	13870	12020	9240
				IPM(FEED)	24	35	62	80	98	106	91
H	38.1	Hardened steel	0.05D	SFM(Vc)	250	365	405	495	505	525	625
				IPT(fz)	.0010	.0027	.0035	.0040	.0044	.0047	.0051
				RPM	15280	11150	8250	7560	6170	5350	4780
				IPM(FEED)	32	61	57	61	54	50	49
	38.2		0.05D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0011	.0026	.0034	.0041	.0043	.0046	.0050
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	33	56	54	58	50	48	45
	40	Chilled Cast Iron	0.05D	SFM(Vc)	330	605	905	1210	1135	1180	1210
				IPT(fz)	.0006	.0009	.0017	.0022	.0035	.0044	.0049
				RPM	20170	18490	18440	18490	13870	12020	9240
				IPM(FEED)	24	35	62	80	98	106	91
	41	Hardened Cast Iron	0.05D	SFM(Vc)	245	355	390	470	475	505	600
				IPT(fz)	.0011	.0026	.0034	.0041	.0043	.0046	.0050
				RPM	14970	10850	7950	7180	5810	5140	4580
				IPM(FEED)	33	56	54	58	50	48	45

AP	~HRc45	HRc45~55
	D1/8 ~ D1/4 = .008 D5/16 ~ D5/8 = .012	D1/8 = .006 D3/16 ~ D5/16 = .010 D3/8 ~ D1 = .012

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM967 SERIES — 2 FLUTE BALL NOSE - PROFILING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 1/32	3/64	1/16	5/64	3/32	1/8
P	1-4	Non-alloy steel	SFM(Vc)	230~300	240~305	240~310	260~310	245~310	275~345
			IPT(fz)	.0001~.0002	.0002~.0005	.0003~.0007	.0003~.0008	.0004~.0010	.0005~.0012
			RPM	28120~36670	19560~24860	14670~18950	12710~15160	9980~12630	8400~10540
			IPM(FEED)	8~17	8~25	8~25	8~25	8~25	8~25
			Ap	.0006~.0014	.0022~.0039	.0030~.0057	.0035~.0071	.0044~.0093	.0053~.0106
	5		SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240
			IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009
			RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330
			IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~124
			Ap	.0006~.0014	.0022~.0039	.0030~.0057	.0035~.0071	.0044~.0093	.0053~.0106
	6-7	Low alloy steel	SFM(Vc)	230~300	240~305	240~310	260~310	245~310	275~345
			IPT(fz)	.0001~.0002	.0002~.0005	.0003~.0007	.0003~.0008	.0004~.0010	.0005~.0012
			RPM	28120~36670	19560~24860	14670~18950	12710~15160	9980~12630	8400~10540
			IPM(FEED)	8~17	8~25	8~25	8~25	8~25	8~25
			Ap	.0006~.0014	.0022~.0039	.0030~.0057	.0035~.0071	.0044~.0093	.0053~.0106
	8-9		SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240
			IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009
			RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330
			IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~124
			Ap	.0006~.0014	.0022~.0039	.0030~.0057	.0035~.0071	.0044~.0093	.0053~.0106
	10	High alloyed steel, and tool steel	SFM(Vc)	230~300	240~305	240~310	260~310	245~310	275~345
			IPT(fz)	.0001~.0002	.0002~.0005	.0003~.0007	.0003~.0008	.0004~.0010	.0005~.0012
			RPM	28120~36670	19560~24860	14670~18950	12710~15160	9980~12630	8400~10540
			IPM(FEED)	8~17	8~25	8~25	8~25	8~25	8~25
			Ap	.0006~.0014	.0022~.0039	.0030~.0057	.0035~.0071	.0044~.0093	.0053~.0106
	11.1-11.2		SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240
			IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009
			RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330
			IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~124
			Ap	.0006~.0014	.0022~.0039	.0030~.0057	.0035~.0071	.0044~.0093	.0053~.0106
H	38.1-38.2	Hardened steel	SFM(Vc)	105~125	105~135	110~135	115~140	110~135	120~150
			IPT(fz)	.00006~.00013	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0005
			RPM	12840~15280	8560~11000	6720~8250	5620~6850	4480~5500	3670~4580
			IPM(FEED)	2~4	2~4	2~4	2~4	2~4	2~4
			Ap	.0003~.0006	.0004~.0009	.0006~.0012	.0007~.0014	.0009~.0018	.0011~.0022
	40	Chilled Cast Iron	SFM(Vc)	170~210	165~215	175~220	180~225	175~220	190~240
			IPT(fz)	.0001~.0002	.0002~.0004	.0002~.0005	.0002~.0006	.0003~.0007	.0003~.0009
			RPM	20780~25670	13450~17520	10700~13450	8800~11000	7130~8960	5810~7330
			IPM(FEED)	3~10	4~12	4~12	4~12	4~12	4~124
			Ap	.0006~.0014	.0022~.0039	.0030~.0057	.0035~.0071	.0044~.0093	.0053~.0106
	41	Hardened Cast Iron	SFM(Vc)	105~125	105~135	110~135	115~140	110~135	120~150
			IPT(fz)	.00006~.00013	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0005
			RPM	12840~15280	8560~11000	6720~8250	5620~6850	4480~5500	3670~4580
			IPM(FEED)	2~4	2~4	2~4	2~4	2~4	2~4
			Ap	.0003~.0006	.0004~.0009	.0006~.0012	.0007~.0014	.0009~.0018	.0011~.0022

X-POWER PRO END MILLS

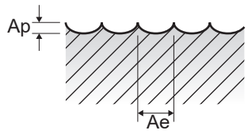
RECOMMENDED CUTTING CONDITIONS

GM096 SERIES 2 FLUTE BALL NOSE (MMC - SPHERE TYPE)

(NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8
P	1-4	Non-alloy steel	0.05D	0.02D	SFM(Vc)	1260	1135	1225	1170	1135	1295	1080
					IPT(fz)	.0016	.0020	.0022	.0026	.0027	.0031	.0039
					RPM	38500	23100	18700	14300	11550	9900	6600
					IPM(FEED)	121	91	82	74	63	61	52
	5		0.05D	0.02D	SFM(Vc)	1190	1080	1150	1080	1080	1150	990
					IPT(fz)	.0016	.0020	.0022	.0026	.0028	.0032	.0040
					RPM	36300	22000	17600	13200	11000	8800	6050
					IPM(FEED)	113	87	78	69	61	56	48
	6-7	Low alloy steel	0.05D	0.02D	SFM(Vc)	1260	1135	1225	1170	1135	1295	1080
					IPT(fz)	.0016	.0020	.0022	.0026	.0027	.0031	.0039
					RPM	38500	23100	18700	14300	11550	9900	6600
					IPM(FEED)	121	91	82	74	63	61	52
	8-9		0.05D	0.02D	SFM(Vc)	1190	1080	1150	1080	1080	1150	990
					IPT(fz)	.0016	.0020	.0022	.0026	.0028	.0032	.0040
					RPM	36300	22000	17600	13200	11000	8800	6050
					IPM(FEED)	113	87	78	69	61	56	48
	10	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	1260	1135	1225	1170	1135	1295	1080
					IPT(fz)	.0016	.0020	.0022	.0026	.0027	.0031	.0039
					RPM	38500	23100	18700	14300	11550	9900	6600
					IPM(FEED)	121	91	82	74	63	61	52
	11.1		0.05D	0.02D	SFM(Vc)	1190	1080	1150	1080	1080	1150	990
					IPT(fz)	.0016	.0020	.0022	.0026	.0028	.0032	.0040
					RPM	36300	22000	17600	13200	11000	8800	6050
					IPM(FEED)	113	87	78	69	61	56	48
	11.2		0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0019	.0021	.0024	.0029	.0030	.0039
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	39	30	28	24	22	20	17
H	38.1 - 38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0019	.0021	.0024	.0029	.0030	.0039
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	39	30	28	24	22	20	17
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0019	.0021	.0024	.0029	.0030	.0039
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	39	30	28	24	22	20	17
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	165	200	230	190	190	195	210
					IPT(fz)	.0006	.0010	.0012	.0018	.0021	.0028	.0032
					RPM	5040	4080	3510	2320	1940	1490	1280
					IPM(FEED)	7	8	8	8	8	8	8



X-POWER PRO END MILLS

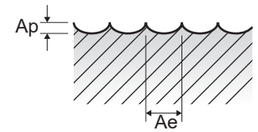
RECOMMENDED CUTTING CONDITIONS

GM096 SERIES 2 FLUTE BALL NOSE (MMC - SPHERE TYPE)

(HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8
P	1-4	Non-alloy steel	0.05D	0.02D	SFM(Vc)	1690	1510	1655	1620	1510	1730	1620
					IPT(fz)	.0015	.0020	.0022	.0025	.0028	.0030	.0035
					RPM	51700	30800	25300	19800	15400	13200	9900
					IPM(FEED)	160	121	113	100	87	78	69
	5		0.05D	0.02D	SFM(Vc)	1585	1460	1585	1530	1405	1585	1440
					IPT(fz)	.0016	.0019	.0021	.0024	.0029	.0032	.0037
					RPM	48400	29700	24200	18700	14300	12100	8800
					IPM(FEED)	152	113	104	91	82	78	65
	6-7	Low alloy steel	0.05D	0.02D	SFM(Vc)	1690	1510	1655	1620	1510	1730	1620
					IPT(fz)	.0015	.0020	.0022	.0025	.0028	.0030	.0035
					RPM	51700	30800	25300	19800	15400	13200	9900
					IPM(FEED)	160	121	113	100	87	78	69
	8-9		0.05D	0.02D	SFM(Vc)	1585	1460	1585	1530	1405	1585	1440
					IPT(fz)	.0016	.0019	.0021	.0024	.0029	.0032	.0037
					RPM	48400	29700	24200	18700	14300	12100	8800
					IPM(FEED)	152	113	104	91	82	78	65
	10	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	1690	1510	1655	1620	1510	1730	1620
					IPT(fz)	.0015	.0020	.0022	.0025	.0028	.0030	.0035
					RPM	51700	30800	25300	19800	15400	13200	9900
					IPM(FEED)	160	121	113	100	87	78	69
	11.1		0.05D	0.02D	SFM(Vc)	1585	1460	1585	1530	1405	1585	1440
					IPT(fz)	.0016	.0019	.0021	.0024	.0029	.0032	.0037
					RPM	48400	29700	24200	18700	14300	12100	8800
					IPM(FEED)	152	113	104	91	82	78	65
	11.2		0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0019	.0021	.0024	.0029	.0030	.0039
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	39	30	28	24	22	20	17
H	38.1 - 38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	610	540	575	540	540	575	595
					IPT(fz)	.0016	.0022	.0023	.0028	.0030	.0034	.0036
					RPM	18700	11000	8800	6600	5500	4400	3630
					IPM(FEED)	61	48	41	37	33	30	26
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	610	540	575	540	540	575	595
					IPT(fz)	.0016	.0022	.0023	.0028	.0030	.0034	.0036
					RPM	18700	11000	8800	6600	5500	4400	3630
					IPM(FEED)	61	48	41	37	33	30	26
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	610	540	575	540	540	575	595
					IPT(fz)	.0016	.0022	.0023	.0028	.0030	.0034	.0036
					RPM	18700	11000	8800	6600	5500	4400	3630
					IPM(FEED)	61	48	41	37	33	30	26



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

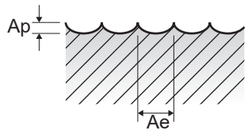
RECOMMENDED CUTTING CONDITIONS

GM097 SERIES 4 FLUTE BALL NOSE (MMC - SPHERE TYPE)

(NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8
P	1-4	Non-alloy steel	0.05D	0.02D	SFM(Vc)	1260	1135	1225	1170	1135	1295	1080
					IPT(fz)	.0016	.0019	.0023	.0027	.0028	.0031	.0046
					RPM	38500	23100	18700	14300	11550	9900	6600
					IPM(FEED)	246	173	173	152	130	121	121
	5		0.05D	0.02D	SFM(Vc)	1190	1080	1150	1080	1080	1150	990
					IPT(fz)	.0016	.0020	.0022	.0025	.0025	.0031	.0039
					RPM	36300	22000	17600	13200	11000	8800	6050
					IPM(FEED)	232	173	152	130	108	108	95
	6-7	Low alloy steel	0.05D	0.02D	SFM(Vc)	1260	1135	1225	1170	1135	1295	1080
					IPT(fz)	.0016	.0019	.0023	.0027	.0028	.0031	.0046
					RPM	38500	23100	18700	14300	11550	9900	6600
					IPM(FEED)	246	173	173	152	130	121	121
	8-9		0.05D	0.02D	SFM(Vc)	1190	1080	1150	1080	1080	1150	990
					IPT(fz)	.0016	.0020	.0022	.0025	.0025	.0031	.0039
					RPM	36300	22000	17600	13200	11000	8800	6050
					IPM(FEED)	232	173	152	130	108	108	95
	10	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	1260	1135	1225	1170	1135	1295	1080
					IPT(fz)	.0016	.0019	.0023	.0027	.0028	.0031	.0046
					RPM	38500	23100	18700	14300	11550	9900	6600
					IPM(FEED)	246	173	173	152	130	121	121
	11.1		0.05D	0.02D	SFM(Vc)	1190	1080	1150	1080	1080	1150	990
					IPT(fz)	.0016	.0020	.0022	.0025	.0025	.0031	.0039
					RPM	36300	22000	17600	13200	11000	8800	6050
					IPM(FEED)	232	173	152	130	108	108	95
	11.2		0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0020	.0021	.0024	.0028	.0031	.0040
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	79	61	56	48	43	41	35
H	38.1 - 38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0020	.0021	.0024	.0028	.0031	.0040
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	79	61	56	48	43	41	35
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0020	.0021	.0024	.0028	.0031	.0040
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	79	61	56	48	43	41	35
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	430	380	430	405	380	430	360
					IPT(fz)	.0015	.0020	.0021	.0024	.0028	.0031	.0040
					RPM	13200	7700	6600	4950	3850	3300	2200
					IPM(FEED)	79	61	56	48	43	41	35



X-POWER PRO END MILLS

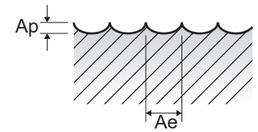
RECOMMENDED CUTTING CONDITIONS

GM097 SERIES 4 FLUTE BALL NOSE (MMC - SPHERE TYPE)

(HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8
P	1-4	Non-alloy steel	0.05D	0.02D	SFM(Vc)	1690	1510	1655	1620	1510	1730	1620
					IPT(fz)	.0015	.0020	.0022	.0025	.0027	.0030	.0034
					RPM	51700	30800	25300	19800	15400	13200	9900
					IPM(FEED)	310	243	220	199	169	160	134
	5		0.05D	0.02D	SFM(Vc)	1585	1460	1585	1530	1405	1585	1440
					IPT(fz)	.0016	.0019	.0022	.0025	.0028	.0031	.0037
					RPM	48400	29700	24200	18700	14300	12100	8800
					IPM(FEED)	310	230	212	186	160	152	130
	6-7	Low alloy steel	0.05D	0.02D	SFM(Vc)	1690	1510	1655	1620	1510	1730	1620
					IPT(fz)	.0015	.0020	.0022	.0025	.0027	.0030	.0034
					RPM	51700	30800	25300	19800	15400	13200	9900
					IPM(FEED)	310	243	220	199	169	160	134
	8-9		0.05D	0.02D	SFM(Vc)	1585	1460	1585	1530	1405	1585	1440
					IPT(fz)	.0016	.0019	.0022	.0025	.0028	.0031	.0037
					RPM	48400	29700	24200	18700	14300	12100	8800
					IPM(FEED)	310	230	212	186	160	152	130
	10	High alloyed steel, and tool steel	0.05D	0.02D	SFM(Vc)	1690	1510	1655	1620	1510	1730	1620
					IPT(fz)	.0015	.0020	.0022	.0025	.0027	.0030	.0034
					RPM	51700	30800	25300	19800	15400	13200	9900
					IPM(FEED)	310	243	220	199	169	160	134
	11.1		0.05D	0.02D	SFM(Vc)	1585	1460	1585	1530	1405	1585	1440
					IPT(fz)	.0016	.0019	.0022	.0025	.0028	.0031	.0037
					RPM	48400	29700	24200	18700	14300	12100	8800
					IPM(FEED)	310	230	212	186	160	152	130
	11.2		0.05D	0.02D	SFM(Vc)	610	595	650	630	540	650	595
					IPT(fz)	.0015	.0019	.0021	.0024	.0028	.0028	.0033
					RPM	18700	12100	9900	7700	5500	4950	3630
					IPM(FEED)	112	91	82	74	61	56	48
H	38.1 - 38.2	Hardened steel	0.05D	0.02D	SFM(Vc)	610	595	650	630	540	650	595
					IPT(fz)	.0015	.0019	.0021	.0024	.0028	.0028	.0033
					RPM	18700	12100	9900	7700	5500	4950	3630
					IPM(FEED)	112	91	82	74	61	56	48
	40	Chilled Cast Iron	0.05D	0.02D	SFM(Vc)	610	595	650	630	540	650	595
					IPT(fz)	.0015	.0019	.0021	.0024	.0028	.0028	.0033
					RPM	18700	12100	9900	7700	5500	4950	3630
					IPM(FEED)	112	91	82	74	61	56	48
	41	Hardened Cast Iron	0.05D	0.02D	SFM(Vc)	610	595	650	630	540	650	595
					IPT(fz)	.0015	.0019	.0021	.0024	.0028	.0028	.0033
					RPM	18700	12100	9900	7700	5500	4950	3630
					IPM(FEED)	112	91	82	74	61	56	48



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

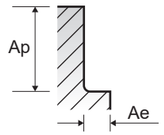
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM666 SERIES — 3-5 FLUTE Roughing - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355
					IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036
					RPM	16880	12530	9930	8630	6480	5630	5180
					IPM(FEED)	99	99	99	102	102	99	92
	5		0.3D	1.5D	SFM(Vc)	875	815	805	850	850	935	1020
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
					RPM	13370	9960	8200	6490	5200	4760	3900
					IPM(FEED)	36	36	36	34	32	31	24
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355
					IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036
					RPM	16880	12530	9930	8630	6480	5630	5180
					IPM(FEED)	99	99	99	102	102	99	92
	8-9		0.3D	1.5D	SFM(Vc)	875	815	805	850	850	935	1020
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
					RPM	13370	9960	8200	6490	5200	4760	3900
					IPM(FEED)	36	36	36	34	32	31	24
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1105	1025	975	1130	1060	1105	1355
					IPT(fz)	.0019	.0026	.0033	.0030	.0039	.0044	.0036
					RPM	16880	12530	9930	8630	6480	5630	5180
					IPM(FEED)	99	99	99	102	102	99	92
	11.1		0.3D	1.5D	SFM(Vc)	875	815	805	850	850	935	1020
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
					RPM	13370	9960	8200	6490	5200	4760	3900
					IPM(FEED)	36	36	36	34	32	31	24
	11.2		0.3D	1.5D	SFM(Vc)	595	555	540	595	580	575	680
					IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012
					RPM	9090	6780	5500	4550	3550	2930	2600
					IPM(FEED)	24	24	24	24	22	18	15
K	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	240	210	210	235	215	235	285
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012
					RPM	3670	2570	2140	1800	1310	1200	1090
					IPM(FEED)	11	10	12	11	7	6	6
	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	595	555	540	595	580	575	680
					IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012
					RPM	9090	6780	5500	4550	3550	2930	2600
					IPM(FEED)	24	24	24	24	22	18	15
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	240	210	210	235	215	235	285
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012
					RPM	3670	2570	2140	1800	1310	1200	1090
					IPM(FEED)	11	10	12	11	7	6	6



X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM156 SERIES — 3-5 FLUTE Roughing - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1070	995	950	1100	1030	1070	1320
					IPT(fz)	.0020	.0026	.0033	.0030	.0039	.0044	.0035
					RPM	16350	12160	9680	8400	6300	5450	5040
					IPM(FEED)	96	96	96	99	99	96	89
	5		0.3D	1.5D	SFM(Vc)	850	790	785	825	825	905	990
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
					RPM	12990	9660	8000	6300	5040	4610	3780
					IPM(FEED)	35	35	35	33	31	30	23
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	1070	995	950	1100	1030	1070	1320
					IPT(fz)	.0020	.0026	.0033	.0030	.0039	.0044	.0035
					RPM	16350	12160	9680	8400	6300	5450	5040
					IPM(FEED)	96	96	96	99	99	96	89
	8-9		0.3D	1.5D	SFM(Vc)	850	790	785	825	825	905	990
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
					RPM	12990	9660	8000	6300	5040	4610	3780
					IPM(FEED)	35	35	35	33	31	30	23
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1070	995	950	1100	1030	1070	1320
					IPT(fz)	.0020	.0026	.0033	.0030	.0039	.0044	.0035
					RPM	16350	12160	9680	8400	6300	5450	5040
					IPM(FEED)	96	96	96	99	99	96	89
	11.1		0.3D	1.5D	SFM(Vc)	850	790	785	825	825	905	990
					IPT(fz)	.0009	.0012	.0015	.0013	.0016	.0016	.0012
					RPM	12990	9660	8000	6300	5040	4610	3780
					IPM(FEED)	35	35	35	33	31	30	23
	11.2		0.3D	1.5D	SFM(Vc)	575	540	525	575	570	560	660
					IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012
					RPM	8790	6600	5350	4390	3480	2850	2520
					IPM(FEED)	24	24	24	24	21	17	15
K	38.1-38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	235	205	205	230	205	230	275
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012
					RPM	3590	2510	2090	1760	1250	1170	1050
					IPM(FEED)	11	10	12	11	7	6	6
	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	575	540	525	575	570	560	660
					IPT(fz)	.0009	.0012	.0015	.0013	.0015	.0015	.0012
					RPM	8790	6600	5350	4390	3480	2850	2520
					IPM(FEED)	24	24	24	24	21	17	15
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	235	205	205	230	205	230	275
					IPT(fz)	.0010	.0013	.0019	.0015	.0013	.0013	.0012
					RPM	3590	2510	2090	1760	1250	1170	1050
					IPM(FEED)	11	10	12	11	7	6	6

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

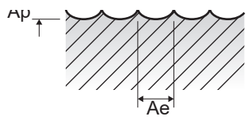
RECOMMENDED CUTTING CONDITIONS

GM876, GM813 SERIES 2 FLUTE BALL NOSE

(NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.2D	SFM(Vc)	180	280	330	410	460	490	525	590	655	740	805	885	950
				IPT(fz)	.0003	.0004	.0010	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071	.0079
				RPM	17470	18110	16010	15910	14880	11890	10190	9540	7940	7180	6510	5370	4610
				IPM(FEED)	11	16	33	33	30	33	36	45	56	68	77	76	73
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	5		0.2D	SFM(Vc)	150	215	245	310	345	395	425	475	525	590	640	705	755
				IPT(fz)	.0003	.0004	.0009	.0009	.0009	.0013	.0016	.0024	.0031	.0039	.0047	.0055	.0063
				RPM	14550	13910	11890	12030	11160	9580	8250	7680	6370	5730	5180	4280	3660
				IPM(FEED)	9	12	22	22	20	24	26	36	40	45	49	47	46
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	6-7	Low alloy steel	0.2D	SFM(Vc)	180	280	330	410	460	490	525	590	655	740	805	885	950
				IPT(fz)	.0003	.0004	.0010	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071	.0079
				RPM	17470	18110	16010	15910	14880	11890	10190	9540	7940	7180	6510	5370	4610
				IPM(FEED)	11	16	33	33	30	33	36	45	56	68	77	76	73
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	8-9		0.2D	SFM(Vc)	150	215	245	310	345	395	425	475	525	590	640	705	755
				IPT(fz)	.0003	.0004	.0009	.0009	.0009	.0013	.0016	.0024	.0031	.0039	.0047	.0055	.0063
				RPM	14550	13910	11890	12030	11160	9580	8250	7680	6370	5730	5180	4280	3660
				IPM(FEED)	9	12	22	22	20	24	26	36	40	45	49	47	46
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	10	High alloyed steel, and tool steel	0.2D	SFM(Vc)	180	280	330	410	460	490	525	590	655	740	805	885	950
				IPT(fz)	.0003	.0004	.0010	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071	.0079
				RPM	17470	18110	16010	15910	14880	11890	10190	9540	7940	7180	6510	5370	4610
				IPM(FEED)	11	16	33	33	30	33	36	45	56	68	77	76	73
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	11.1 - 11.2		0.2D	SFM(Vc)	150	215	245	310	345	395	425	475	525	590	640	705	755
				IPT(fz)	.0003	.0004	.0009	.0009	.0009	.0013	.0016	.0024	.0031	.0039	.0047	.0055	.0063
				RPM	14550	13910	11890	12030	11160	9580	8250	7680	6370	5730	5180	4280	3660
				IPM(FEED)	9	12	22	22	20	24	26	36	40	45	49	47	46
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.2D	SFM(Vc)	180	260	330	410	445	475	525	590	655	720	805	870	950
				IPT(fz)	.0003	.0004	.0010	.0010	.0010	.0014	.0018	.0024	.0035	.0047	.0059	.0071	.0079
				RPM	17470	16820	16010	15910	14390	11520	10190	9540	7940	6990	6510	5280	4610
				IPM(FEED)	11	15	33	33	29	32	36	45	56	66	77	75	73
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
H	38.1 - 38.2	Hardened steel	0.1D	SFM(Vc)	65	100	115	130	165	195	215	215	230	230	245	245	260
				IPT(fz)	.0003	.0004	.0006	.0006	.0007	.0008	.0009	.0012	.0017	.0022	.0028	.0036	.0045
				RPM	6310	6470	5580	5050	5340	4730	4170	3480	2790	2230	1980	1490	1260
				IPM(FEED)	4	6	7	6	7	8	8	8	10	10	11	11	11
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	40	Chilled Cast Iron	0.2D	SFM(Vc)	150	215	245	310	345	395	425	475	525	590	640	705	755
				IPT(fz)	.0003	.0004	.0009	.0009	.0009	.0013	.0016	.0024	.0031	.0039	.0047	.0055	.0063
				RPM	14550	13910	11890	12030	11160	9580	8250	7680	6370	5730	5180	4280	3660
				IPM(FEED)	9	12	22	22	20	24	26	36	40	45	49	47	46
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	41	Hardened Cast Iron	0.1D	SFM(Vc)	65	100	115	130	165	195	215	215	230	230	245	245	260
				IPT(fz)	.0003	.0004	.0006	.0006	.0007	.0008	.0009	.0012	.0017	.0022	.0028	.0036	.0045
				RPM	6310	6470	5580	5050	5340	4730	4170	3480	2790	2230	1980	1490	1260
				IPM(FEED)	4	6	7	6	7	8	8	8	10	10	11	11	11
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118



X-POWER PRO END MILLS

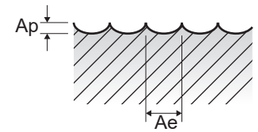
RECOMMENDED CUTTING CONDITIONS

GM876, GM813 SERIES 2 FLUTE BALL NOSE

(HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-5	Non-alloy steel	0.05D	SFM(Vc)	295	395	490	605	720	970	1215	1460	1540	1625	1690	1770	1835
				IPT(fz)	.0010	.0012	.0014	.0017	.0019	.0027	.0034	.0037	.0047	.0055	.0063	.0071	.0079
				RPM	28620	25550	23770	23480	23290	23530	23580	23610	18680	15770	13670	10730	8900
				IPM(FEED)	59	60	66	78	88	129	160	177	177	172	172	153	140
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	6-9	Low alloy steel	0.05D	SFM(Vc)	295	395	490	605	720	970	1215	1460	1540	1625	1690	1770	1835
				IPT(fz)	.0010	.0012	.0014	.0017	.0019	.0027	.0034	.0037	.0047	.0055	.0063	.0071	.0079
				RPM	28620	25550	23770	23480	23290	23530	23580	23610	18680	15770	13670	10730	8900
				IPM(FEED)	59	60	66	78	88	129	160	177	177	172	172	153	140
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	10 - 11.2	High alloyed steel, and tool steel	0.05D	SFM(Vc)	295	395	490	605	720	970	1215	1460	1540	1625	1690	1770	1835
				IPT(fz)	.0010	.0012	.0014	.0017	.0019	.0027	.0034	.0037	.0047	.0055	.0063	.0071	.0079
				RPM	28620	25550	23770	23480	23290	23530	23580	23610	18680	15770	13670	10730	8900
				IPM(FEED)	59	60	66	78	88	129	160	177	177	172	172	153	140
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	SFM(Vc)	295	395	490	605	720	970	1215	1460	1540	1625	1690	1770	1835
				IPT(fz)	.0010	.0012	.0014	.0017	.0019	.0027	.0034	.0037	.0047	.0055	.0063	.0071	.0079
				RPM	28620	25550	23770	23480	23290	23530	23580	23610	18680	15770	13670	10730	8900
				IPM(FEED)	59	60	66	78	88	129	160	177	177	172	172	153	140
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
H	38.1 - 38.2	Hardened steel	0.05D	SFM(Vc)	295	395	490	540	590	625	690	720	770	805	835	885	920
				IPT(fz)	.0006	.0007	.0009	.0010	.0012	.0016	.0020	.0024	.0030	.0034	.0037	.0041	.0045
				RPM	28620	25550	23770	20960	19080	15160	13390	11640	9340	7810	6750	5370	4460
				IPM(FEED)	36	38	41	43	47	50	53	55	55	53	51	44	40
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	40	Chilled Cast Iron	0.05D	SFM(Vc)	295	395	490	605	720	970	1215	1460	1540	1625	1690	1770	1835
				IPT(fz)	.0010	.0012	.0014	.0017	.0019	.0027	.0034	.0037	.0047	.0055	.0063	.0071	.0079
				RPM	28620	25550	23770	23480	23290	23530	23580	23610	18680	15770	13670	10730	8900
				IPM(FEED)	59	60	66	78	88	129	160	177	177	172	172	153	140
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118
	41	Hardened Cast Iron	0.05D	SFM(Vc)	295	395	490	605	720	970	1215	1460	1540	1625	1690	1770	1835
				IPT(fz)	.0006	.0007	.0009	.0010	.0012	.0016	.0020	.0024	.0030	.0034	.0037	.0041	.0045
				RPM	28620	25550	23770	20960	19080	15160	13390	11640	9340	7810	6750	5370	4460
				IPM(FEED)	36	38	41	43	47	50	53	55	55	53	51	44	40
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118	.0118



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM886 SERIES — 2 FLUTE BALL NOSE RIB PROCESSING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	1.2	1.4
P	1-4	Non-alloy steel	SFM(Vc)	170~215	200~260	270~345	315~395	310~395	320~395
			IPT(fz)	.0001~.0002	.0001~.0003	.0001~.0003	.0002~.0004	.0002~.0005	.0002~.0006
			RPM	32990~41720	32340~42050	32750~41840	30560~38330	25070~31940	22180~27380
			IPM(FEED)	7~20	9~26	9~26	10~29	10~32	10~32
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
	5		SFM(Vc)	120~155	145~185	195~245	220~280	220~280	225~275
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0004
			RPM	23290~30080	23450~29920	23650~29720	21350~27170	17790~22640	15590~19060
			IPM(FEED)	4~11	5~15	5~15	5~16	5~16	5~16
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
	6-7	Low alloy steel	SFM(Vc)	170~215	200~260	270~345	315~395	310~395	320~395
			IPT(fz)	.0001~.0002	.0001~.0003	.0001~.0003	.0002~.0004	.0002~.0005	.0002~.0006
			RPM	32990~41720	32340~42050	32750~41840	30560~38330	25070~31940	22180~27380
			IPM(FEED)	7~20	9~26	9~26	10~29	10~32	10~32
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
	8-9		SFM(Vc)	120~155	145~185	195~245	220~280	220~280	225~275
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0004
			RPM	23290~30080	23450~29920	23650~29720	21350~27170	17790~22640	15590~19060
			IPM(FEED)	4~11	5~15	5~15	5~16	5~16	5~16
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
	10	High alloyed steel, and tool steel	SFM(Vc)	170~215	200~260	270~345	315~395	310~395	320~395
			IPT(fz)	.0001~.0002	.0001~.0003	.0001~.0003	.0002~.0004	.0002~.0005	.0002~.0006
			RPM	32990~41720	32340~42050	32750~41840	30560~38330	25070~31940	22180~27380
			IPM(FEED)	7~20	9~26	9~26	10~29	10~32	10~32
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
	11.1 - 11.2		SFM(Vc)	120~155	145~185	195~245	220~280	220~280	225~275
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0004
			RPM	23290~30080	23450~29920	23650~29720	21350~27170	17790~22640	15590~19060
			IPM(FEED)	4~11	5~15	5~15	5~16	5~16	5~16
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	170~215	200~260	270~345	315~395	310~395	320~395
			IPT(fz)	.0001~.0002	.0001~.0003	.0001~.0003	.0002~.0004	.0002~.0005	.0002~.0006
			RPM	32990~41720	32340~42050	32750~41840	30560~38330	25070~31940	22180~27380
			IPM(FEED)	7~20	9~26	9~26	10~29	10~32	10~32
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
H	38.1 - 38.2	Hardened steel	SFM(Vc)	75~95	95~115	125~155	140~175	140~180	140~175
			IPT(fz)	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0004
			RPM	14550~18440	15360~18600	15160~18800	13580~16980	11320~14550	9700~12130
			IPM(FEED)	4~7	5~9	5~9	5~10	5~10	5~10
			Ap	.0002~.0004	.0002~.0004	.0003~.0006	.0004~.0007	.0004~.0009	.0005~.0010
	40	Chilled Cast Iron	SFM(Vc)	120~155	145~185	195~245	220~280	220~280	225~275
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0004
			RPM	23290~30080	23450~29920	23650~29720	21350~27170	17790~22640	15590~19060
			IPM(FEED)	4~11	5~15	5~15	5~16	5~16	5~16
			Ap	.0009~.0018	.0011~.0021	.0014~.0028	.0018~.0035	.0022~.0039	.0024~.0049
	41	Hardened Cast Iron	SFM(Vc)	75~95	95~115	125~155	140~175	140~180	140~175
			IPT(fz)	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0004
			RPM	14550~18440	15360~18600	15160~18800	13580~16980	11320~14550	9700~12130
			IPM(FEED)	4~7	5~9	5~9	5~10	5~10	5~10
			Ap	.0002~.0004	.0002~.0004	.0003~.0006	.0004~.0007	.0004~.0009	.0005~.0010

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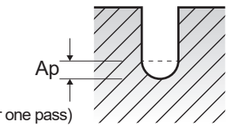
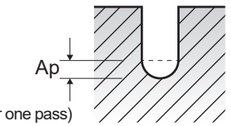


X-POWER PRO END MILLS
RECOMMENDED CUTTING CONDITIONS
GM886 SERIES — 2 FLUTE BALL NOSE RIB PROCESSING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

VDI 3323	Parameter	Diameter (Ø) 1.5	1.6	1.8	2.0	3.0	4.0	5.0	6.0
1-4	SFM(Vc)	310~390	310~405	330~420	335~410	340~420	370~475	370~475	370~475
	IPT(fz)	.0003~.0006	.0003~.0007	.0003~.0007	.0003~.0008	.0005~.0012	.0006~.0014	.0007~.0018	.0009~.0021
	RPM	20050~25230	18800~24560	17790~22640	16250~19890	11000~13580	8980~11520	7180~9220	5980~7680
	IPM(FEED)	10~32	10~32	10~32	10~32	10~32	10~32	10~32	10~32
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
5	SFM(Vc)	220~285	230~285	235~290	240~290	225~290	250~340	250~335	255~340
	IPT(fz)	.0002~.0004	.0002~.0005	.0002~.0005	.0002~.0006	.0007~.0017	.0009~.0020	.0011~.0025	.0013~.0029
	RPM	14230~18440	13950~17280	12670~15630	11640~14070	7280~9380	6060~8250	4850~6500	4120~5500
	IPM(FEED)	5~16	5~16	5~16	5~16	5~16	5~16	5~16	5~16
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
6-7	SFM(Vc)	310~390	310~405	330~420	335~410	340~420	370~475	370~475	370~475
	IPT(fz)	.0003~.0006	.0003~.0007	.0003~.0007	.0003~.0008	.0005~.0012	.0006~.0014	.0007~.0018	.0009~.0021
	RPM	20050~25230	18800~24560	17790~22640	16250~19890	11000~13580	8980~11520	7180~9220	5980~7680
	IPM(FEED)	10~32	10~32	10~32	10~32	10~32	10~32	10~32	10~32
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
8-9	SFM(Vc)	220~285	230~285	235~290	240~290	225~290	250~340	250~335	255~340
	IPT(fz)	.0002~.0004	.0002~.0005	.0002~.0005	.0002~.0006	.0007~.0017	.0009~.0020	.0011~.0025	.0013~.0029
	RPM	14230~18440	13950~17280	12670~15630	11640~14070	7280~9380	6060~8250	4850~6500	4120~5500
	IPM(FEED)	5~16	5~16	5~16	5~16	5~16	5~16	5~16	5~16
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
10	SFM(Vc)	310~390	310~405	330~420	335~410	340~420	370~475	370~475	370~475
	IPT(fz)	.0003~.0006	.0003~.0007	.0003~.0007	.0003~.0008	.0005~.0012	.0006~.0014	.0007~.0018	.0009~.0021
	RPM	20050~25230	18800~24560	17790~22640	16250~19890	11000~13580	8980~11520	7180~9220	5980~7680
	IPM(FEED)	10~32	10~32	10~32	10~32	10~32	10~32	10~32	10~32
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
11.1 - 11.2	SFM(Vc)	220~285	230~285	235~290	240~290	225~290	250~340	250~335	255~340
	IPT(fz)	.0002~.0004	.0002~.0005	.0002~.0005	.0002~.0006	.0007~.0017	.0009~.0020	.0011~.0025	.0013~.0029
	RPM	14230~18440	13950~17280	12670~15630	11640~14070	7280~9380	6060~8250	4850~6500	4120~5500
	IPM(FEED)	5~16	5~16	5~16	5~16	5~16	5~16	5~16	5~16
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
15 - 20	SFM(Vc)	310~390	310~405	330~420	335~410	340~420	370~475	370~475	370~475
	IPT(fz)	.0003~.0006	.0003~.0007	.0003~.0007	.0003~.0008	.0005~.0012	.0006~.0014	.0007~.0018	.0009~.0021
	RPM	20050~25230	18800~24560	17790~22640	16250~19890	11000~13580	8980~11520	7180~9220	5980~7680
	IPM(FEED)	10~32	10~32	10~32	10~32	10~32	10~32	10~32	10~32
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
38.1 - 38.2	SFM(Vc)	140~175	145~180	145~185	150~185	150~185	170~210	170~210	170~215
	IPT(fz)	.0003~.0005	.0003~.0005	.0003~.0005	.0004~.0006	.0005~.0009	.0006~.0010	.0008~.0013	.0009~.0015
	RPM	9060~11320	8790~10920	7820~9970	7280~8980	4850~5980	4120~5090	3300~4080	2750~3480
	IPM(FEED)	5~10	5~10	5~10	5~10	5~10	5~10	5~10	5~10
	Ap	.0006~.0011	.0006~.0012	.0006~.0013	.0007~.0014	.0011~.0022	.0014~.0028	.0017~.0035	.0021~.0041
40	SFM(Vc)	220~285	230~285	235~290	240~290	225~290	250~340	250~335	255~340
	IPT(fz)	.0002~.0004	.0002~.0005	.0002~.0005	.0002~.0006	.0007~.0017	.0009~.0020	.0011~.0025	.0013~.0029
	RPM	14230~18440	13950~17280	12670~15630	11640~14070	7280~9380	6060~8250	4850~6500	4120~5500
	IPM(FEED)	5~16	5~16	5~16	5~16	5~16	5~16	5~16	5~16
	Ap	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
41	SFM(Vc)	140~175	145~180	145~185	150~185	150~185	170~210	170~210	170~215
	IPT(fz)	.0003~.0005	.0003~.0005	.0003~.0005	.0004~.0006	.0005~.0009	.0006~.0010	.0008~.0013	.0009~.0015
	RPM	9060~11320	8790~10920	7820~9970	7280~8980	4850~5980	4120~5090	3300~4080	2750~3480
	IPM(FEED)	5~10	5~10	5~10	5~10	5~10	5~10	5~10	5~10
	Ap	.0006~.0011	.0006~.0012	.0006~.0013	.0007~.0014	.0011~.0022	.0014~.0028	.0017~.0035	.0021~.0041



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

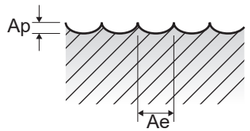
RECOMMENDED CUTTING CONDITIONS

GM902 SERIES — 2 FLUTE BALL NOSE with TAPER NECK

(NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1.0	2.0	3.0	4.0	5.0	6.0	8.0
P	5	Non-alloy steel	0.2D	SFM(Vc)	115	195	260	295	310	360	395
				IPT(fz)	.0003	.0006	.0009	.0012	.0016	.0024	.0031
				RPM	11160	9460	8410	7160	6020	5820	4790
				IPM(FEED)	7	11	15	18	19	28	30
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
	8-9	Low alloy steel	0.2D	SFM(Vc)	115	195	260	295	310	360	395
				IPT(fz)	.0003	.0006	.0009	.0012	.0016	.0024	.0031
				RPM	11160	9460	8410	7160	6020	5820	4790
				IPM(FEED)	7	11	15	18	19	28	30
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
	11.1	High alloyed steel, and tool steel	0.2D	SFM(Vc)	115	195	260	295	310	360	395
				IPT(fz)	.0003	.0006	.0009	.0012	.0016	.0024	.0031
				RPM	11160	9460	8410	7160	6020	5820	4790
				IPM(FEED)	7	11	15	18	19	28	30
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
	11.2		0.1D	SFM(Vc)	180	245	330	360	410	445	490
				IPT(fz)	.0005	.0011	.0017	.0020	.0023	.0026	.0030
				RPM	17470	11890	10670	8730	7960	7200	5940
				IPM(FEED)	17	26	36	36	37	38	35
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098
H	38.1	Hardened steel	0.1D	SFM(Vc)	180	245	330	360	410	445	490
				IPT(fz)	.0005	.0011	.0017	.0020	.0023	.0026	.0030
				RPM	17470	11890	10670	8730	7960	7200	5940
				IPM(FEED)	17	26	36	36	37	38	35
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098
	38.2		0.1D	SFM(Vc)	180	245	310	360	410	425	460
				IPT(fz)	.0005	.0010	.0017	.0020	.0023	.0027	.0029
				RPM	17470	11890	10030	8730	7960	6870	5580
				IPM(FEED)	17	24	34	36	37	37	33
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098
	40	Chilled Cast Iron	0.1D	SFM(Vc)	180	245	330	360	410	445	490
				IPT(fz)	.0005	.0011	.0017	.0020	.0023	.0026	.0030
				RPM	17470	11890	10670	8730	7960	7200	5940
				IPM(FEED)	17	26	36	36	37	38	35
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098
	41	Hardened Cast Iron	0.1D	SFM(Vc)	180	245	310	360	410	425	460
				IPT(fz)	.0005	.0010	.0017	.0020	.0023	.0027	.0029
				RPM	17470	11890	10030	8730	7960	6870	5580
				IPM(FEED)	17	24	34	36	37	37	33
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

X-POWER PRO END MILLS

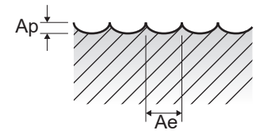
RECOMMENDED CUTTING CONDITIONS

GM902 SERIES — 2 FLUTE BALL NOSE with TAPER NECK

(HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 1.0	2.0	3.0	4.0	5.0	6.0	8.0
P	1-5	Non-alloy steel	0.05D	SFM(Vc)	215	360	540	720	900	1100	1165
				IPT(fz)	.0010	.0014	.0019	.0028	.0034	.0037	.0047
				RPM	20860	17470	17470	17470	17470	17790	14130
				IPM(FEED)	42	50	66	97	119	133	132
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
	6-9	Low alloy steel	0.05D	SFM(Vc)	215	360	540	720	900	1100	1165
				IPT(fz)	.0010	.0014	.0019	.0028	.0034	.0037	.0047
				RPM	20860	17470	17470	17470	17470	17790	14130
				IPM(FEED)	42	50	66	97	119	133	132
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
	10 - 11.2	High alloyed steel, and tool steel	0.05D	SFM(Vc)	215	360	540	720	900	1100	1165
				IPT(fz)	.0010	.0014	.0019	.0028	.0034	.0037	.0047
				RPM	20860	17470	17470	17470	17470	17790	14130
				IPM(FEED)	42	50	66	97	119	133	132
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	SFM(Vc)	215	360	540	720	900	1100	1165
				IPT(fz)	.0010	.0014	.0019	.0028	.0034	.0037	.0047
				RPM	20860	17470	17470	17470	17470	17790	14130
				IPM(FEED)	42	50	66	97	119	133	132
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
H	38	Hardened steel	0.05D	SFM(Vc)	180	245	330	360	410	445	490
				IPT(fz)	.0008	.0015	.0027	.0032	.0035	.0040	.0044
				RPM	17470	11890	10670	8730	7960	7200	5940
				IPM(FEED)	26	35	58	55	55	57	53
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098
	38.2		0.05D	SFM(Vc)	180	245	310	360	395	425	460
				IPT(fz)	.0007	.0017	.0026	.0031	.0034	.0040	.0043
				RPM	17470	11890	10030	8730	7670	6870	5580
				IPM(FEED)	23	40	52	54	52	55	48
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098
	40	Chilled Cast Iron	0.05D	SFM(Vc)	215	360	540	720	900	1100	1165
				IPT(fz)	.0010	.0014	.0019	.0028	.0034	.0037	.0047
				RPM	20860	17470	17470	17470	17470	17790	14130
				IPM(FEED)	42	50	66	97	119	133	132
				Ap	.0079	.0079	.0079	.0079	.0079	.0079	.0118
	41	Hardened Cast Iron	0.05D	SFM(Vc)	180	245	310	360	395	425	460
				IPT(fz)	.0007	.0017	.0026	.0031	.0034	.0040	.0043
				RPM	17470	11890	10030	8730	7670	6870	5580
				IPM(FEED)	23	40	52	54	52	55	48
				Ap	.0020	.0039	.0059	.0079	.0098	.0098	.0098



X-POWER PRO END MILLS

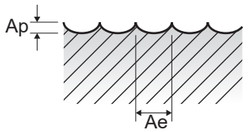
RECOMMENDED CUTTING CONDITIONS

GM815 SERIES 4 FLUTE BALL NOSE

(NORMAL SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-4	Non-alloy steel	0.2D	SFM(Vc)	345	425	460	490	560	625	690	755	820
				IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054
				RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970
				IPM(FEED)	34	41	46	51	64	81	95	107	107
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	5		0.2D	SFM(Vc)	245	330	360	395	445	490	560	605	655
				IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042
				RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970
				IPM(FEED)	19	28	33	36	51	56	64	69	66
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	6-7	Low alloy steel	0.2D	SFM(Vc)	345	425	460	490	560	625	690	755	820
				IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054
				RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970
				IPM(FEED)	34	41	46	51	64	81	95	107	107
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	8-9		0.2D	SFM(Vc)	245	330	360	395	445	490	560	605	655
				IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042
				RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970
				IPM(FEED)	19	28	33	36	51	56	64	69	66
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	10	High alloyed steel, and tool steel	0.2D	SFM(Vc)	345	425	460	490	560	625	690	755	820
				IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054
				RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970
				IPM(FEED)	34	41	46	51	64	81	95	107	107
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	11.1 - 11.2		0.2D	SFM(Vc)	245	330	360	395	445	490	560	605	655
				IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042
				RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970
				IPM(FEED)	19	28	33	36	51	56	64	69	66
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.2D	SFM(Vc)	345	425	460	490	560	625	690	755	820
				IPT(fz)	.0005	.0008	.0010	.0013	.0018	.0027	.0035	.0044	.0054
				RPM	16740	13750	11160	9510	9060	7580	6700	6110	4970
				IPM(FEED)	34	41	46	51	64	81	95	107	107
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
H	38.1 - 39.2	Hardened steel	0.1D	SFM(Vc)	100	150	180	195	215	215	215	230	230
				IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0013	.0016	.0021	.0027
				RPM	4850	4850	4370	3780	3480	2610	2090	1860	1400
				IPM(FEED)	6	9	11	11	12	13	13	16	15
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	40	Chilled Cast Iron	0.2D	SFM(Vc)	245	330	360	395	445	490	560	605	655
				IPT(fz)	.0004	.0007	.0009	.0012	.0018	.0024	.0029	.0035	.0042
				RPM	11890	10670	8730	7670	7200	5940	5430	4890	3970
				IPM(FEED)	19	28	33	36	51	56	64	69	66
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	41	Hardened Cast Iron	0.1D	SFM(Vc)	100	150	180	195	215	215	215	230	230
				IPT(fz)	.0003	.0005	.0006	.0007	.0009	.0013	.0016	.0021	.0027
				RPM	4850	4850	4370	3780	3480	2610	2090	1860	1400
				IPM(FEED)	6	9	11	11	12	13	13	16	15
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118



X-POWER PRO END MILLS

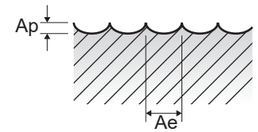
RECOMMENDED CUTTING CONDITIONS

GM815 SERIES 4 FLUTE BALL NOSE

(HIGH SPEED)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-5	Non-alloy steel	0.05D	SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	6-9	Low alloy steel	0.05D	SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	10 - 11.2	High alloyed steel, and tool steel	0.05D	SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
H	38.1 - 39.2	Hardened steel	0.05D	SFM(Vc)	460	560	590	655	690	720	755	785	820
				IPT(fz)	.0007	.0009	.0013	.0015	.0018	.0022	.0025	.0028	.0031
				RPM	22320	18110	14310	12710	11160	8730	7330	6350	4970
				IPM(FEED)	60	65	72	76	79	77	74	71	62
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	40	Chilled Cast Iron	0.05D	SFM(Vc)	460	690	900	1130	1360	1445	1510	1590	1655
				IPT(fz)	.0010	.0014	.0021	.0025	.0028	.0035	.0041	.0047	.0054
				RPM	22320	22320	21830	21930	21990	17530	14650	12860	10040
				IPM(FEED)	91	126	179	221	246	248	242	243	215
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118
	41	Hardened Cast Iron	0.05D	SFM(Vc)	460	560	590	655	690	720	755	785	820
				IPT(fz)	.0007	.0009	.0013	.0015	.0018	.0022	.0025	.0028	.0031
				RPM	22320	18110	14310	12710	11160	8730	7330	6350	4970
				IPM(FEED)	60	65	72	76	79	77	74	71	62
				Ap	.0079	.0079	.0079	.0079	.0079	.0118	.0118	.0118	.0118



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

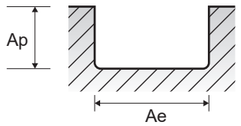
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM818 SERIES — 2 FLUTE CORNER RADIUS - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 4.0	5.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280
					IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020
					RPM	5940	5050	4210	3400	2720	2260
					IPM(FEED)	8	9	11	12	11	9
	5		1.0D	0.3D	SFM(Vc)	150	165	165	180	180	195
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0016
					RPM	3640	3200	2670	2180	1750	1580
					IPM(FEED)	4	4	5	6	5	5
	6-7	Low alloy steel	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280
					IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020
					RPM	5940	5050	4210	3400	2720	2260
					IPM(FEED)	8	9	11	12	11	9
	8-9		1.0D	0.3D	SFM(Vc)	150	165	165	180	180	195
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0016
					RPM	3640	3200	2670	2180	1750	1580
					IPM(FEED)	4	4	5	6	5	5
	10	High alloyed steel, and tool steel	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280
					IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020
					RPM	5940	5050	4210	3400	2720	2260
					IPM(FEED)	8	9	11	12	11	9
	11.1 - 11.2		1.0D	0.3D	SFM(Vc)	150	165	165	180	180	195
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0016
					RPM	3640	3200	2670	2180	1750	1580
					IPM(FEED)	4	4	5	6	5	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.3D	SFM(Vc)	245	260	260	280	280	280
					IPT(fz)	.0006	.0009	.0013	.0018	.0021	.0020
					RPM	5940	5050	4210	3400	2720	2260
					IPM(FEED)	8	9	11	12	11	9
H	38.1 - 38.2	Hardened steel	1.0D	0.3D	SFM(Vc)	100	115	115	115	115	115
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008
					RPM	2430	2230	1860	1400	1120	930
					IPM(FEED)	1	1	2	1	1	1
	40	Chilled Cast Iron	1.0D	0.3D	SFM(Vc)	150	165	165	180	180	195
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0016
					RPM	3640	3200	2670	2180	1750	1580
					IPM(FEED)	4	4	5	6	5	5
	41	Hardened Cast Iron	1.0D	0.3D	SFM(Vc)	100	115	115	115	115	115
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008
					RPM	2430	2230	1860	1400	1120	930
					IPM(FEED)	1	1	2	1	1	1



X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM8A1 SERIES — 2 FLUTE CORNER RADIUS RIB PROCESSING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 1.0	1.2	1.4	1.5	1.6	1.8
P	1-4	Non-alloy steel	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320
			IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011
			RPM	23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250
			IPM(FEED)	12~34	12~37	12~37	12~37	12~37	12~37
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
	5		SFM(Vc)	170~215	170~215	175~210	170~220	175~220	180~225
			IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001
			RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
	6-7	Low alloy steel	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320
			IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011
			RPM	23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250
			IPM(FEED)	12~34	12~37	12~37	12~37	12~37	12~37
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
	8-9		SFM(Vc)	170~215	170~215	175~210	170~220	175~220	180~225
			IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001
			RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
	10	High alloyed steel, and tool steel	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320
			IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011
			RPM	23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250
			IPM(FEED)	12~34	12~37	12~37	12~37	12~37	12~37
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
	11.1 - 11.2		SFM(Vc)	170~215	170~215	175~210	170~220	175~220	180~225
			IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001
			RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	245~305	240~290	240~305	235~300	240~310	255~320
			IPT(fz)	.0002~.0006	.0003~.0008	.0003~.0009	.0004~.0010	.0004~.0010	.0004~.0011
			RPM	23770~29590	19410~23450	16630~21140	15200~19410	14550~18800	13750~17250
			IPM(FEED)	12~34	12~37	12~37	12~37	12~37	12~37
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
H	38.1 - 38.2	Hardened steel	SFM(Vc)	110~135	110~135	110~135	110~135	110~140	110~140
			IPT(fz)	.0001~.0002	.0002~.0002	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004
			RPM	10670~13100	8890~10920	7620~9360	7120~8730	6670~8490	5930~7550
			IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5
			Ap	.0004~.0007	.0004~.0009	.0005~.0010	.0006~.0011	.0006~.0012	.0006~.0013
	40	Chilled Cast Iron	SFM(Vc)	170~215	170~215	175~210	170~220	175~220	180~225
			IPT(fz)	.0002~.0006	.0003~.0007	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001
			RPM	16500~20860	13750~17380	12130~14550	11000~14230	10610~13340	9700~12130
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0018~.0035	.0022~.0039	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063
	41	Hardened Cast Iron	SFM(Vc)	110~135	110~135	110~135	110~135	110~140	110~140
			IPT(fz)	.0001~.0002	.0002~.0002	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004
			RPM	10670~13100	8890~10920	7620~9360	7120~8730	6670~8490	5930~7550
			IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5
			Ap	.0004~.0007	.0004~.0009	.0005~.0010	.0006~.0011	.0006~.0012	.0006~.0013

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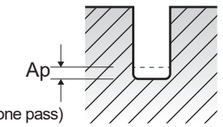


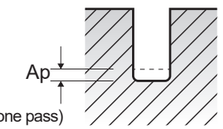
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM8A1 SERIES — 2 FLUTE CORNER RADIUS RIB PROCESSING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 2.0	2.5	3.0	4.0	5.0	6.0
P	1-4	Non-alloy steel	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325
			IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
			RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
			IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
	5		SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230
			IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
			RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
	6-7	Low alloy steel	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325
			IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
			RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
			IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
	8-9		SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230
			IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
			RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
	10	High alloyed steel, and tool steel	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325
			IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
			RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
			IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
	11.1 - 11.2		SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230
			IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
			RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	260~315	255~325	260~325	260~325	260~325	260~325
			IPT(fz)	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
			RPM	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
			IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
H	38.1 - 38.2	Hardened steel	SFM(Vc)	115~145	115~145	115~145	115~145	115~140	115~170
			IPT(fz)	.0003~.0004	.0003~.0005	.0004~.0006	.0005~.0008	.0006~.001	.0008~.001
			RPM	5580~7040	4460~5630	3720~4690	2790~3520	2230~2720	1860~2750
			IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5
			Ap	.0007~.0014	.0009~.0018	.0011~.0022	.0014~.0028	.0018~.0035	.0021~.0043
	40	Chilled Cast Iron	SFM(Vc)	180~225	180~230	180~225	180~230	180~225	180~230
			IPT(fz)	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
			RPM	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2910~3720
			IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25
			Ap	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
	41	Hardened Cast Iron	SFM(Vc)	115~145	115~145	115~145	115~145	115~140	115~170
			IPT(fz)	.0003~.0004	.0003~.0005	.0004~.0006	.0005~.0008	.0006~.001	.0008~.001
			RPM	5580~7040	4460~5630	3720~4690	2790~3520	2230~2720	1860~2750
			IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5
			Ap	.0007~.0014	.0009~.0018	.0011~.0022	.0014~.0028	.0018~.0035	.0021~.0043



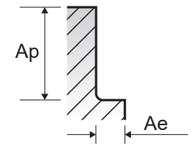
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM839 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445
					IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019
					RPM	15040	11640	9950	7440	5580	4320	3600
					IPM(FEED)	14	17	30	35	37	32	27
	5		0.05D	1.0D	SFM(Vc)	215	230	245	280	280	280	280
					IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0014	.0014
					RPM	10430	7440	5940	4530	3400	2720	2260
					IPM(FEED)	10	11	18	21	20	16	13
	6-7	Low alloy steel	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445
					IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019
					RPM	15040	11640	9950	7440	5580	4320	3600
					IPM(FEED)	14	17	30	35	37	32	27
	8-9		0.05D	1.0D	SFM(Vc)	215	230	245	280	280	280	280
					IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0014	.0014
					RPM	10430	7440	5940	4530	3400	2720	2260
					IPM(FEED)	10	11	18	21	20	16	13
	10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445
					IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019
					RPM	15040	11640	9950	7440	5580	4320	3600
					IPM(FEED)	14	17	30	35	37	32	27
	11.1 - 11.2		0.05D	1.0D	SFM(Vc)	215	230	245	280	280	280	280
					IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0014	.0014
					RPM	10430	7440	5940	4530	3400	2720	2260
					IPM(FEED)	10	11	18	21	20	16	13
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	310	360	410	460	460	445	445
					IPT(fz)	.0002	.0004	.0007	.0012	.0017	.0018	.0019
					RPM	15040	11640	9950	7440	5580	4320	3600
					IPM(FEED)	14	17	30	35	37	32	27
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	130	130	165	165	180	180	195
					IPT(fz)	.0001	.0002	.0002	.0004	.0006	.0007	.0007
					RPM	6310	4210	4000	2670	2180	1750	1580
					IPM(FEED)	2	3	3	4	6	5	4
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	215	230	245	280	280	280	280
					IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0014	.0014
					RPM	10430	7440	5940	4530	3400	2720	2260
					IPM(FEED)	10	11	18	21	20	16	13
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	130	130	165	165	180	180	195
					IPT(fz)	.0001	.0002	.0002	.0004	.0006	.0007	.0007
					RPM	6310	4210	4000	2670	2180	1750	1580
					IPM(FEED)	2	3	3	4	6	5	4



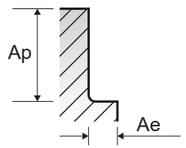
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM819 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	280	310	280
					IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009
					RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360
					IPM(FEED)	7	9	10	9	10	10	8	7	5
	5		0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	195	180
					IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011
					RPM	4850	3640	3200	2670	2180	1750	1580	1180	870
					IPM(FEED)	6	6	8	8	8	8	7	6	4
	6-7	Low alloy steel	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	280	310	280
					IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009
					RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360
					IPM(FEED)	7	9	10	9	10	10	8	7	5
	8-9		0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	195	180
					IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011
					RPM	4850	3640	3200	2670	2180	1750	1580	1180	870
					IPM(FEED)	6	6	8	8	8	8	7	6	4
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	280	310	280
					IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009
					RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360
					IPM(FEED)	7	9	10	9	10	10	8	7	5
	11.1 - 11.2		0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	195	180
					IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011
					RPM	4850	3640	3200	2670	2180	1750	1580	1180	870
					IPM(FEED)	6	6	8	8	8	8	7	6	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	230	245	260	260	280	280	280	310	280
					IPT(fz)	.0002	.0004	.0005	.0006	.0007	.0009	.0009	.0009	.0009
					RPM	7440	5940	5050	4210	3400	2720	2260	1880	1360
					IPM(FEED)	7	9	10	9	10	10	8	7	5
H	38.1 - 38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	80	100	115	115	115	115	115	115	115
					IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0008	.0008	.0009	.0009
					RPM	2590	2430	2230	1860	1400	1120	930	700	560
					IPM(FEED)	3	3	4	4	4	4	3	2	2
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	150	150	165	165	180	180	195	195	180
					IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0011	.0012	.0012	.0011
					RPM	4850	3640	3200	2670	2180	1750	1580	1180	870
					IPM(FEED)	6	6	8	8	8	8	7	6	4
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	80	100	115	115	115	115	115	115	115
					IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0008	.0008	.0009	.0009
					RPM	2590	2430	2230	1860	1400	1120	930	700	560
					IPM(FEED)	3	3	4	4	4	4	3	2	2



X-POWER PRO END MILLS
RECOMMENDED CUTTING CONDITIONS

GM810 SERIES — 2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.4	0.8	1.0	1.2	1.5
P	5	Non-alloy steel	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195
					IPT(fz)	.0001	.0001	.0002	.0002	.0002
					RPM	31530	26080	22320	17380	12610
					IPM(FEED)	5	6	7	7	6
	8-9	Low alloy steel	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195
					IPT(fz)	.0001	.0001	.0002	.0002	.0002
					RPM	31530	26080	22320	17380	12610
					IPM(FEED)	5	6	7	7	6
	11.1 - 11.2	High alloyed steel, and tool steel	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195
					IPT(fz)	.0001	.0001	.0002	.0002	.0002
					RPM	31530	26080	22320	17380	12610
					IPM(FEED)	5	6	7	7	6
H	38.1 - 38.2	Hardened steel	1.0D	D<1:0.02D D≥1:0.05D	SFM(Vc)	100	165	165	165	150
					IPT(fz)	.00004	.0001	.0001	.0001	.0002
					RPM	24260	20010	16010	13340	9700
					IPM(FEED)	2	3	4	3	3
	40	Chilled Cast Iron	1.0D	D<1:0.15D D≥1:0.25D	SFM(Vc)	130	215	230	215	195
					IPT(fz)	.0001	.0001	.0002	.0002	.0002
					RPM	31530	26080	22320	17380	12610
					IPM(FEED)	5	6	7	7	6
	41	Hardened Cast Iron	1.0D	D<1:0.02D D≥1:0.05D	SFM(Vc)	100	165	165	165	150
					IPT(fz)	.00004	.0001	.0001	.0001	.0002
					RPM	24260	20010	16010	13340	9700
					IPM(FEED)	2	3	4	3	3

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
					RPM	10430	7920	6790	5730	5010	3760	2860	2510	2000	1500
					IPM(FEED)	8	9	13	14	16	17	14	13	10	8
	5		1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	195
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	.0018
					RPM	7280	4850	4000	3490	2910	2180	1750	1460	1180	950
					IPM(FEED)	6	6	8	9	9	9	7	6	5	4
	6-7	Low alloy steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
					RPM	10430	7920	6790	5730	5010	3760	2860	2510	2000	1500
					IPM(FEED)	8	9	13	14	16	17	14	13	10	8
	8-9		1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	195
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	.0018
					RPM	7280	4850	4000	3490	2910	2180	1750	1460	1180	950
					IPM(FEED)	6	6	8	9	9	9	7	6	5	4
	10	High alloyed steel, and tool steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
					RPM	10430	7920	6790	5730	5010	3760	2860	2510	2000	1500
					IPM(FEED)	8	9	13	14	16	17	14	13	10	8
	11.1 - 11.2		1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	195
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	.0018
					RPM	7280	4850	4000	3490	2910	2180	1750	1460	1180	950
					IPM(FEED)	6	6	8	9	9	9	7	6	5	4
M	14.1	Stainless steel	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	115	130	150	150	165	150	150	150	165	150
					IPT(fz)	.0003	.0006	.0009	.0012	.0015	.0021	.0023	.0023	.0026	.0023
					RPM	5580	4210	3640	2910	2670	1820	1460	1210	1000	730
					IPM(FEED)	4	5	7	7	8	8	7	6	5	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	215	245	280	295	310	310	295	310	330	310
					IPT(fz)	.0004	.0006	.0010	.0013	.0015	.0023	.0025	.0025	.0024	.0025
					RPM	10430	7920	6790	5730	5010	3760	2860	2510	2000	1500
					IPM(FEED)	8	9	13	14	16	17	14	13	10	8
H	38.1 - 38.2	Hardened steel	1.0D	0.05D	SFM(Vc)	100	100	115	115	115	130	130	130	130	130
					IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0011	.0011	.0011	.0011	.0011
					RPM	4850	3230	2790	2230	1860	1580	1260	1050	790	630
					IPM(FEED)	2	2	2	2	3	4	3	2	2	1
	40	Chilled Cast Iron	1.0D	D≤3:0.2D D>3:0.5D	SFM(Vc)	150	150	165	180	180	180	180	180	195	195
					IPT(fz)	.0004	.0006	.0009	.0013	.0016	.0020	.0020	.0019	.0020	.0018
					RPM	7280	4850	4000	3490	2910	2180	1750	1460	1180	950
					IPM(FEED)	6	6	8	9	9	9	7	6	5	4
	41	Hardened Cast Iron	1.0D	0.05D	SFM(Vc)	100	100	115	115	115	130	130	130	130	130
					IPT(fz)	.0002	.0003	.0004	.0005	.0007	.0011	.0011	.0011	.0011	.0011
					RPM	4850	3230	2790	2230	1860	1580	1260	1050	790	630
					IPM(FEED)	2	2	2	2	3	4	3	2	2	1

X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM883 SERIES — 2 FLUTE RIB PROCESSING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2
P	1-4	Non-alloy steel	SFM(Vc)	135~175	170~215	200~260	235~305	235~220	245~305	245~305	240~290
			IPT(fz)	.0001~.0002	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0005	.0002~.0005	.0002~.0006	.0003~.0008
			RPM	32750~42450	32990~41720	32340~42050	32570~42280	28500~26680	26410~32880	23770~29590	19410~23450
			IPM(FEED)	8~18	8~18	10~24	10~24	12~26	12~30	12~34	12~37
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
	5		SFM(Vc)	95~120	120~150	145~180	170~210	170~210	170~220	170~215	170~215
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0005	.0002~.0006	.0003~.0007
			RPM	23040~29110	23290~29110	23450~29110	23560~29110	20620~25470	18330~23720	16500~20860	13750~17380
			IPM(FEED)	4~14	4~14	5~18	5~18	5~20	7~22	8~25	8~25
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
	6-7	Low alloy steel	SFM(Vc)	135~175	170~215	200~260	235~305	235~220	245~305	245~305	240~290
			IPT(fz)	.0001~.0002	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0005	.0002~.0005	.0002~.0006	.0003~.0008
			RPM	32750~42450	32990~41720	32340~42050	32570~42280	28500~26680	26410~32880	23770~29590	19410~23450
			IPM(FEED)	8~18	8~18	10~24	10~24	12~26	12~30	12~34	12~37
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
	8-9		SFM(Vc)	95~120	120~150	145~180	170~210	170~210	170~220	170~215	170~215
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0005	.0002~.0006	.0003~.0007
			RPM	23040~29110	23290~29110	23450~29110	23560~29110	20620~25470	18330~23720	16500~20860	13750~17380
			IPM(FEED)	4~14	4~14	5~18	5~18	5~20	7~22	8~25	8~25
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
	10	High alloyed steel, and tool steel	SFM(Vc)	135~175	170~215	200~260	235~305	235~220	245~305	245~305	240~290
			IPT(fz)	.0001~.0002	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0005	.0002~.0005	.0002~.0006	.0003~.0008
			RPM	32750~42450	32990~41720	32340~42050	32570~42280	28500~26680	26410~32880	23770~29590	19410~23450
			IPM(FEED)	8~18	8~18	10~24	10~24	12~26	12~30	12~34	12~37
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
	11.1 - 11.2		SFM(Vc)	95~120	120~150	145~180	170~210	170~210	170~220	170~215	170~215
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0005	.0002~.0006	.0003~.0007
			RPM	23040~29110	23290~29110	23450~29110	23560~29110	20620~25470	18330~23720	16500~20860	13750~17380
			IPM(FEED)	4~14	4~14	5~18	5~18	5~20	7~22	8~25	8~25
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	SFM(Vc)	135~175	170~215	200~260	235~305	235~220	245~305	245~305	240~290
			IPT(fz)	.0001~.0002	.0001~.0002	.0002~.0003	.0002~.0003	.0002~.0005	.0002~.0005	.0002~.0006	.0003~.0008
			RPM	32750~42450	32990~41720	32340~42050	32570~42280	28500~26680	26410~32880	23770~29590	19410~23450
			IPM(FEED)	8~18	8~18	10~24	10~24	12~26	12~30	12~34	12~37
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
H	38.1 - 38.2	Hardened steel	SFM(Vc)	60~75	75~90	95~110	110~130	110~130	105~120	110~135	110~135
			IPT(fz)	.00004~.0001	.00004~.0001	.0001~.0001	.0001~.0001	.00005~.0001	.0001~.0002	.0001~.0002	.0002~.0002
			RPM	14550~18190	14550~17470	15360~17790	15250~18020	13340~15770	11320~12940	10670~13100	8890~10920
			IPM(FEED)	1~4	1~4	2~5	2~5	2~5	2~5	3~5	3~5
			Ap	.0002~.0003	.0002~.0004	.0002~.0004	.0002~.0005	.0003~.0006	.0003~.0006	.0004~.0007	.0004~.0009
	40	Chilled Cast Iron	SFM(Vc)	95~120	120~150	145~180	170~210	170~210	170~220	170~215	170~215
			IPT(fz)	.0001~.0002	.0001~.0002	.0001~.0003	.0001~.0003	.0001~.0004	.0002~.0005	.0002~.0006	.0003~.0007
			RPM	23040~29110	23290~29110	23450~29110	23560~29110	20620~25470	18330~23720	16500~20860	13750~17380
			IPM(FEED)	4~14	4~14	5~18	5~18	5~20	7~22	8~25	8~25
			Ap	.0003~.0007	.0004~.0009	.0004~.0010	.0005~.0012	.0006~.0014	.0012~.0024	.0018~.0035	.0022~.0039
	41	Hardened Cast Iron	SFM(Vc)	60~75	75~90	95~110	110~130	110~130	105~120	110~135	110~135
			IPT(fz)	.00004~.0001	.00004~.0001	.0001~.0001	.0001~.0001	.00005~.0001	.0001~.0002	.0001~.0002	.0002~.0002
			RPM	14550~18190	14550~17470	15360~17790	15250~18020	13340~15770	11320~12940	10670~13100	8890~10920
			IPM(FEED)	1~4	1~4	2~5	2~5	2~5	2~5	3~5	3~5
			Ap	.0002~.0003	.0002~.0004	.0002~.0004	.0002~.0005	.0003~.0006	.0003~.0006	.0004~.0007	.0004~.0009

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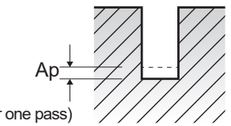
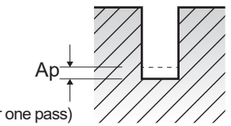


(Depth of cut per one pass)

X-POWER PRO END MILLS
RECOMMENDED CUTTING CONDITIONS
GM883 SERIES — 2 FLUTE RIB PROCESSING
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

VDI 3323	Parameter	Diameter (Ø) 1.4	1.5	1.6	1.8	2.0	2.5	3.0	4.0	5.0	6.0
1-4	SFM(Vc)	240~305	235~300	240~310	255~320	260~315	255~325	260~325	260~325	260~325	260~325
	IPT(fz)	.0003~.0009	.0004~.001	.0004~.001	.0004~.0011	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
	RPM	16630~21140	15200~19410	14550~18800	13750~17250	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
	IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
5	SFM(Vc)	175~210	170~220	175~220	180~225	180~225	180~230	180~225	180~230	180~225	180~230
	IPT(fz)	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
	RPM	12130~14550	11000~14230	10610~13340	9700~12130	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2830~3720
	IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
6-7	SFM(Vc)	240~305	235~300	240~310	255~320	260~315	255~325	260~325	260~325	260~325	260~325
	IPT(fz)	.0003~.0009	.0004~.001	.0004~.001	.0004~.0011	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
	RPM	16630~21140	15200~19410	14550~18800	13750~17250	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
	IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
8-9	SFM(Vc)	175~210	170~220	175~220	180~225	180~225	180~230	180~225	180~230	180~225	180~230
	IPT(fz)	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
	RPM	12130~14550	11000~14230	10610~13340	9700~12130	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2830~3720
	IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
10	SFM(Vc)	240~305	235~300	240~310	255~320	260~315	255~325	260~325	260~325	260~325	260~325
	IPT(fz)	.0003~.0009	.0004~.001	.0004~.001	.0004~.0011	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
	RPM	16630~21140	15200~19410	14550~18800	13750~17250	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
	IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
11.1 - 11.2	SFM(Vc)	175~210	170~220	175~220	180~225	180~225	180~230	180~225	180~230	180~225	180~230
	IPT(fz)	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
	RPM	12130~14550	11000~14230	10610~13340	9700~12130	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2830~3720
	IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
15 - 20	SFM(Vc)	240~305	235~300	240~310	255~320	260~315	255~325	260~325	260~325	260~325	260~325
	IPT(fz)	.0003~.0009	.0004~.001	.0004~.001	.0004~.0011	.0005~.0012	.0006~.0015	.0007~.0018	.0009~.0024	.0011~.0029	.0014~.0035
	RPM	16630~21140	15200~19410	14550~18800	13750~17250	12610~15280	9900~12610	8410~10510	6310~7880	5050~6310	4210~5260
	IPM(FEED)	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37	12~37
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
38.1 - 38.2	SFM(Vc)	110~135	110~135	110~140	110~140	115~145	115~145	115~145	115~145	115~140	115~170
	IPT(fz)	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0004	.0003~.0005	.0004~.0006	.0005~.0008	.0006~.001	.0008~.001
	RPM	7620~9360	7120~8730	6670~8490	5930~7550	5580~7040	4460~5630	3720~4690	2790~3520	2230~2720	1860~2750
	IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5	3~5	3~5	3~5	3~5
	Ap	.0005~.0010	.0006~.0011	.0006~.0012	.0006~.0013	.0007~.0014	.0009~.0018	.0011~.0022	.0014~.0028	.0018~.0035	.0021~.0043
40	SFM(Vc)	175~210	170~220	175~220	180~225	180~225	180~230	180~225	180~230	180~225	180~230
	IPT(fz)	.0003~.0009	.0004~.0009	.0004~.0009	.0004~.001	.0005~.0011	.0006~.0014	.0007~.0017	.0009~.0022	.0011~.0028	.0014~.0033
	RPM	12130~14550	11000~14230	10610~13340	9700~12130	8730~10920	6990~8930	5820~7280	4370~5580	3490~4370	2830~3720
	IPM(FEED)	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25	8~25
	Ap	.0024~.0049	.0028~.0053	.0030~.0057	.0031~.0063	.0035~.0071	.0044~.0093	.0053~.0106	.0071~.0142	.0089~.0177	.0106~.0213
41	SFM(Vc)	110~135	110~135	110~140	110~140	115~145	115~145	115~145	115~145	115~140	115~170
	IPT(fz)	.0002~.0003	.0002~.0003	.0002~.0003	.0002~.0004	.0003~.0004	.0003~.0005	.0004~.0006	.0005~.0008	.0006~.001	.0008~.001
	RPM	7620~9360	7120~8730	6670~8490	5930~7550	5580~7040	4460~5630	3720~4690	2790~3520	2230~2720	1860~2750
	IPM(FEED)	3~5	3~5	3~5	3~5	3~5	3~5	3~5	3~5	3~5	3~5
	Ap	.0005~.0010	.0006~.0011	.0006~.0012	.0006~.0013	.0007~.0014	.0009~.0018	.0011~.0022	.0014~.0028	.0018~.0035	.0021~.0043



(Depth of cut per one pass)

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

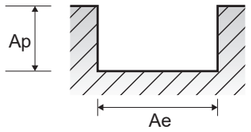
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM895 SERIES — 3 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-4	Non-alloy steel	1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0003	.0005	.0006	.0008	.0011	.0012	.0012	.0012
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	8	8	12	12	14	15	13	11	9
	5		1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0003	.0004	.0006	.0008	.0009	.0009	.0009	.0009
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	5	6	7	7	9	8	6	5	4
	6-7	Low alloy steel	1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0003	.0005	.0006	.0008	.0011	.0012	.0012	.0012
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	8	8	12	12	14	15	13	11	9
	8-9		1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0003	.0004	.0006	.0008	.0009	.0009	.0009	.0009
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	5	6	7	7	9	8	6	5	4
	10	High alloyed steel, and tool steel	1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0003	.0005	.0006	.0008	.0011	.0012	.0012	.0012
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	8	8	12	12	14	15	13	11	9
	11.1 - 11.2		1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0003	.0004	.0006	.0008	.0009	.0009	.0009	.0009
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	5	6	7	7	9	8	6	5	4
M	14.1	Stainless steel	1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	150	165	1805	180	195	195	195	180	195
					IPT(fz)	.0002	.0003	.0000	.0006	.0008	.0010	.0011	.0011	.0012
					RPM	7280	5340	43780	3490	3150	2370	1890	1460	1180
					IPM(FEED)	3	5	6	6	7	7	7	5	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0003	.0005	.0006	.0008	.0011	.0012	.0012	.0012
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	8	8	12	12	14	15	13	11	9
H	38.1 - 38.2	Hardened steel	1.0D	0.05D	SFM(Vc)	115	115	130	130	130	150	150	165	165
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0005	.0005	.0005
					RPM	5580	3720	3150	2520	2100	1820	1460	1330	1000
					IPM(FEED)	1	2	2	2	2	3	2	2	2
	40	Chilled Cast Iron	1.0D	D≤3 : 0.2D D>3 : 0.5D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0003	.0004	.0006	.0008	.0009	.0009	.0009	.0009
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	5	6	7	7	9	8	6	5	4
	41	Hardened Cast Iron	1.0D	0.05D	SFM(Vc)	115	115	130	130	130	150	150	165	165
					IPT(fz)	.0001	.0002	.0002	.0003	.0003	.0005	.0005	.0005	.0005
					RPM	5580	3720	3150	2520	2100	1820	1460	1330	1000
					IPM(FEED)	1	2	2	2	2	3	2	2	2



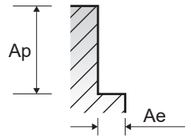
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM895 SERIES — 3 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
P	1-4	Non-alloy steel	0.05D	1.0D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0017	.0019	.0019	.0019
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	9	10	19	20	22	23	20	17	13
	5		0.05D	1.0D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	6	7	12	12	14	13	10	8	7
	6-7	Low alloy steel	0.05D	1.0D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0017	.0019	.0019	.0019
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	9	10	19	20	22	23	20	17	13
	8-9		0.05D	1.0D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	6	7	12	12	14	13	10	8	7
	10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0017	.0019	.0019	.0019
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	9	10	19	20	22	23	20	17	13
	11.1 - 11.2		0.05D	1.0D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	6	7	12	12	14	13	10	8	7
M	14.1	Stainless steel	0.05D	1.0D	SFM(Vc)	150	165	180	180	195	195	195	180	195
					IPT(fz)	.0002	.0003	.0007	.0009	.0012	.0017	.0018	.0017	.0019
					RPM	7280	5340	4370	3490	3150	2370	1890	1460	1180
					IPM(FEED)	5	6	9	10	11	12	10	8	7
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	260	295	345	360	375	375	375	375	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0017	.0019	.0019	.0019
					RPM	12610	9540	8370	6990	6060	4550	3640	3030	2400
					IPM(FEED)	9	10	19	20	22	23	20	17	13
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	115	115	130	130	130	150	150	165	165
					IPT(fz)	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0007	.0007
					RPM	5580	3720	3150	2520	2100	1820	1460	1330	1000
					IPM(FEED)	1	2	2	2	3	3	3	3	2
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	165	195	215	215	230	230	230	230	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015
					RPM	8010	6310	5220	4170	3720	2790	2230	1860	1490
					IPM(FEED)	6	7	12	12	14	13	10	8	7
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	115	115	130	130	130	150	150	165	165
					IPT(fz)	.0001	.0002	.0002	.0003	.0004	.0006	.0007	.0007	.0007
					RPM	5580	3720	3150	2520	2100	1820	1460	1330	1000
					IPM(FEED)	1	2	2	2	3	3	3	3	2



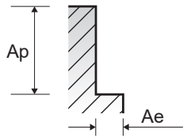
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM811 SERIES — 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.05D	1.0D	SFM(Vc)	260	310	345	360	375	395	375	375	410	395	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0016	.0019	.0019	.0019	.0019	.0018
					RPM	12610	10030	8370	6990	6060	4790	3640	3030	2490	1920	1530
					IPM(FEED)	12	14	25	27	29	32	27	23	18	14	11
	5		0.05D	1.0D	SFM(Vc)	180	195	215	215	230	230	230	230	245	245	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0016
					RPM	8730	6310	5220	4170	3720	2790	2230	1860	1490	1190	950
					IPM(FEED)	8	9	16	16	18	17	13	11	9	7	6
	6-7	Low alloy steel	0.05D	1.0D	SFM(Vc)	260	310	345	360	375	395	375	375	410	395	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0016	.0019	.0019	.0019	.0019	.0018
					RPM	12610	10030	8370	6990	6060	4790	3640	3030	2490	1920	1530
					IPM(FEED)	12	14	25	27	29	32	27	23	18	14	11
	8-9		0.05D	1.0D	SFM(Vc)	180	195	215	215	230	230	230	230	245	245	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0016
					RPM	8730	6310	5220	4170	3720	2790	2230	1860	1490	1190	950
					IPM(FEED)	8	9	16	16	18	17	13	11	9	7	6
	10	High alloyed steel, and tool steel	0.05D	1.0D	SFM(Vc)	260	310	345	360	375	395	375	375	410	395	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0016	.0019	.0019	.0019	.0019	.0018
					RPM	12610	10030	8370	6990	6060	4790	3640	3030	2490	1920	1530
					IPM(FEED)	12	14	25	27	29	32	27	23	18	14	11
	11.1 - 11.2		0.05D	1.0D	SFM(Vc)	180	195	215	215	230	230	230	230	245	245	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0016
					RPM	8730	6310	5220	4170	3720	2790	2230	1860	1490	1190	950
					IPM(FEED)	8	9	16	16	18	17	13	11	9	7	6
M	14.1	Stainless steel	0.05D	1.0D	SFM(Vc)	150	165	180	180	195	195	195	180	195	195	195
					IPT(fz)	.0002	.0004	.0007	.0009	.0011	.0016	.0018	.0017	.0018	.0018	.0018
					RPM	7280	5340	4370	3490	3150	2370	1890	1460	1180	950	760
					IPM(FEED)	6	8	12	13	15	15	14	10	9	7	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	1.0D	SFM(Vc)	260	310	345	360	375	395	375	375	410	395	395
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0016	.0019	.0019	.0019	.0019	.0018
					RPM	12610	10030	8370	6990	6060	4790	3640	3030	2490	1920	1530
					IPM(FEED)	12	14	25	27	29	32	27	23	18	14	11
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	115	105	130	130	130	150	165	165	165	165	150
					IPT(fz)	.0001	.0002	.0002	.0003	.0004	.0007	.0006	.0007	.0006	.0006	.0006
					RPM	5580	3400	3150	2520	2100	1820	1600	1330	1000	800	580
					IPM(FEED)	2	2	3	3	3	5	4	4	3	2	1
	40	Chilled Cast Iron	0.05D	1.0D	SFM(Vc)	180	195	215	215	230	230	230	230	245	245	245
					IPT(fz)	.0002	.0004	.0007	.0009	.0012	.0015	.0015	.0015	.0015	.0015	.0016
					RPM	8730	6310	5220	4170	3720	2790	2230	1860	1490	1190	950
					IPM(FEED)	8	9	16	16	18	17	13	11	9	7	6
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	115	105	130	130	130	150	165	165	165	165	150
					IPT(fz)	.0001	.0002	.0002	.0003	.0004	.0007	.0006	.0007	.0006	.0006	.0006
					RPM	5580	3400	3150	2520	2100	1820	1600	1330	1000	800	580
					IPM(FEED)	2	2	3	3	3	5	4	4	3	2	1



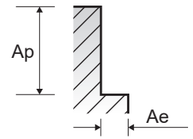
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM817 SERIES — 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.05D	2.5D	SFM(Vc)	195	215	230	245	260	260	280	260	295	280
					IPT(fz)	.0002	.0004	.0006	.0008	.0012	.0016	.0019	.0019	.0020	.0019
					RPM	9460	6950	5580	4750	4210	3150	2720	2100	1790	1360
					IPM(FEED)	9	10	12	16	19	21	21	16	14	10
	5		0.05D	2.5D	SFM(Vc)	115	130	130	150	150	150	165	165	165	165
					IPT(fz)	.0002	.0003	.0004	.0005	.0008	.0011	.0013	.0014	.0014	.0013
					RPM	5580	4210	3150	2910	2430	1820	1600	1330	1000	800
					IPM(FEED)	4	5	5	6	8	8	8	7	6	4
	6-7	Low alloy steel	0.05D	2.5D	SFM(Vc)	195	215	230	245	260	260	280	260	295	280
					IPT(fz)	.0002	.0004	.0006	.0008	.0012	.0016	.0019	.0019	.0020	.0019
					RPM	9460	6950	5580	4750	4210	3150	2720	2100	1790	1360
					IPM(FEED)	9	10	12	16	19	21	21	16	14	10
	8-9		0.05D	2.5D	SFM(Vc)	115	130	130	150	150	150	165	165	165	165
					IPT(fz)	.0002	.0003	.0004	.0005	.0008	.0011	.0013	.0014	.0014	.0013
					RPM	5580	4210	3150	2910	2430	1820	1600	1330	1000	800
					IPM(FEED)	4	5	5	6	8	8	8	7	6	4
	10	High alloyed steel, and tool steel	0.05D	2.5D	SFM(Vc)	195	215	230	245	260	260	280	260	295	280
					IPT(fz)	.0002	.0004	.0006	.0008	.0012	.0016	.0019	.0019	.0020	.0019
					RPM	9460	6950	5580	4750	4210	3150	2720	2100	1790	1360
					IPM(FEED)	9	10	12	16	19	21	21	16	14	10
	11.1 - 11.2		0.05D	2.5D	SFM(Vc)	115	130	130	150	150	150	165	165	165	165
					IPT(fz)	.0002	.0003	.0004	.0005	.0008	.0011	.0013	.0014	.0014	.0013
					RPM	5580	4210	3150	2910	2430	1820	1600	1330	1000	800
					IPM(FEED)	4	5	5	6	8	8	8	7	6	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.5D	SFM(Vc)	195	215	230	245	260	260	280	260	295	280
					IPT(fz)	.0002	.0004	.0006	.0008	.0012	.0016	.0019	.0019	.0020	.0019
					RPM	9460	6950	5580	4750	4210	3150	2720	2100	1790	1360
					IPM(FEED)	9	10	12	16	19	21	21	16	14	10
H	38.1 - 38.2	Hardened steel	0.02D	2.0D	SFM(Vc)	65	80	80	100	100	100	100	100	100	100
					IPT(fz)	.0002	.0002	.0003	.0004	.0006	.0008	.0011	.0010	.0010	.0010
					RPM	3150	2590	1940	1940	1620	1210	970	810	610	490
					IPM(FEED)	2	3	3	3	4	4	4	3	2	2
	40	Chilled Cast Iron	0.05D	2.5D	SFM(Vc)	115	130	130	150	150	150	165	165	165	165
					IPT(fz)	.0002	.0003	.0004	.0005	.0008	.0011	.0013	.0014	.0014	.0013
					RPM	5580	4210	3150	2910	2430	1820	1600	1330	1000	800
					IPM(FEED)	4	5	5	6	8	8	8	7	6	4
	41	Hardened Cast Iron	0.02D	2.0D	SFM(Vc)	65	80	80	100	100	100	100	100	100	100
					IPT(fz)	.0002	.0002	.0003	.0004	.0006	.0008	.0011	.0010	.0010	.0010
					RPM	3150	2590	1940	1940	1620	1210	970	810	610	490
					IPM(FEED)	2	3	3	3	4	4	4	3	2	2



X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM812 SERIES — 6&8 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

(NORMAL SPEED)

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.1D	1.5D	SFM(Vc)	345	360	360	360	360	345
					IPT(fz)	.0024	.0031	.0039	.0039	.0039	.0029
					RPM	5580	4370	3490	2910	2180	1670
					IPM(FEED)	79	82	82	68	52	40
	5		0.05D	1.5D	SFM(Vc)	245	245	245	245	245	245
					IPT(fz)	.0023	.0031	.0039	.0038	.0039	.0030
					RPM	3960	2970	2380	1980	1490	1190
					IPM(FEED)	56	55	55	46	35	28
	6-7	Low alloy steel	0.1D	1.5D	SFM(Vc)	345	360	360	360	360	345
					IPT(fz)	.0024	.0031	.0039	.0039	.0039	.0029
					RPM	5580	4370	3490	2910	2180	1670
					IPM(FEED)	79	82	82	68	52	40
	8-9		0.05D	1.5D	SFM(Vc)	245	245	245	245	245	245
					IPT(fz)	.0023	.0031	.0039	.0038	.0039	.0030
					RPM	3960	2970	2380	1980	1490	1190
					IPM(FEED)	56	55	55	46	35	28
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	345	360	360	360	360	345
					IPT(fz)	.0024	.0031	.0039	.0039	.0039	.0029
					RPM	5580	4370	3490	2910	2180	1670
					IPM(FEED)	79	82	82	68	52	40
	11.1 - 11.2		0.05D	1.5D	SFM(Vc)	245	245	245	245	245	245
					IPT(fz)	.0023	.0031	.0039	.0038	.0039	.0030
					RPM	3960	2970	2380	1980	1490	1190
					IPM(FEED)	56	55	55	46	35	28
H	38.1	Hardened steel	0.05D	1.5D	SFM(Vc)	245	245	245	245	245	245
					IPT(fz)	.0023	.0031	.0039	.0038	.0039	.0030
					RPM	3960	2970	2380	1980	1490	1190
					IPM(FEED)	56	55	55	46	35	28
	38.2		0.05D	1.0D	SFM(Vc)	100	100	100	100	115	100
					IPT(fz)	.0009	.0012	.0014	.0014	.0014	.0011
					RPM	1620	1210	970	810	700	490
					IPM(FEED)	8	9	8	7	6	4
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	245	245	245	245	245	245
					IPT(fz)	.0023	.0031	.0039	.0038	.0039	.0030
					RPM	3960	2970	2380	1980	1490	1190
					IPM(FEED)	56	55	55	46	35	28
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	100	100	100	100	115	100
					IPT(fz)	.0009	.0012	.0014	.0014	.0014	.0011
					RPM	1620	1210	970	810	700	490
					IPM(FEED)	8	9	8	7	6	4

(HIGH SPEED)

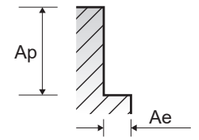
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-5	Non-alloy steel	0.05D	1.5D	SFM(Vc)	1065	1065	1050	1065	1065	1065
					IPT(fz)	.0024	.0032	.0039	.0039	.0039	.0030
					RPM	17220	12920	10190	8610	6460	5170
					IPM(FEED)	244	247	241	204	153	124
	6-9	Low alloy steel	0.05D	1.5D	SFM(Vc)	1065	1065	1050	1065	1065	1065
					IPT(fz)	.0024	.0032	.0039	.0039	.0039	.0030
					RPM	17220	12920	10190	8610	6460	5170
					IPM(FEED)	244	247	241	204	153	124
	10 - 11.2	High alloyed steel, and tool steel	0.05D	1.5D	SFM(Vc)	1065	1065	1050	1065	1065	1065
					IPT(fz)	.0024	.0032	.0039	.0039	.0039	.0030
					RPM	17220	12920	10190	8610	6460	5170
					IPM(FEED)	244	247	241	204	153	124
H	38.1	Hardened steel	0.05D	1.5D	SFM(Vc)	1065	1065	1050	1065	1065	1065
					IPT(fz)	.0024	.0032	.0039	.0039	.0039	.0030
					RPM	17220	12920	10190	8610	6460	5170
					IPM(FEED)	244	247	241	204	153	124
	38.2		0.05D	1.0D	SFM(Vc)	525	525	525	525	525	525
					IPT(fz)	.0024	.0032	.0040	.0039	.0039	.0029
					RPM	8490	6370	5090	4250	3180	2550
					IPM(FEED)	120	122	122	100	75	59
	40	Chilled Cast Iron	0.05D	1.5D	SFM(Vc)	1065	1065	1050	1065	1065	1065
					IPT(fz)	.0024	.0032	.0039	.0039	.0039	.0030
					RPM	17220	12920	10190	8610	6460	5170
					IPM(FEED)	244	247	241	204	153	124
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	525	525	525	525	525	525
					IPT(fz)	.0024	.0032	.0040	.0039	.0039	.0029
					RPM	8490	6370	5090	4250	3180	2550
					IPM(FEED)	120	122	122	100	75	59

X-POWER PRO END MILLS
RECOMMENDED CUTTING CONDITIONS

GM834 SERIES — 6 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.01D	3.0D	SFM(Vc)	150	150	150	150	150	150	150
					IPT(fz)	.0014	.0017	.0021	.0023	.0025	.0027	.0029
					RPM	2430	1820	1460	1210	910	730	580
					IPM(FEED)	20	19	19	17	14	12	10
	5		0.01D	3.0D	SFM(Vc)	100	100	100	100	100	100	100
					IPT(fz)	.0014	.0017	.0019	.0021	.0024	.0026	.0027
					RPM	1620	1210	970	810	610	490	390
					IPM(FEED)	13	12	11	10	9	8	6
	6-7	Low alloy steel	0.01D	3.0D	SFM(Vc)	150	150	150	150	150	150	150
					IPT(fz)	.0014	.0017	.0021	.0023	.0025	.0027	.0029
					RPM	2430	1820	1460	1210	910	730	580
					IPM(FEED)	20	19	19	17	14	12	10
	8-9		0.01D	3.0D	SFM(Vc)	100	100	100	100	100	100	100
					IPT(fz)	.0014	.0017	.0019	.0021	.0024	.0026	.0027
					RPM	1620	1210	970	810	610	490	390
					IPM(FEED)	13	12	11	10	9	8	6
	10	High alloyed steel, and tool steel	0.01D	3.0D	SFM(Vc)	150	150	150	150	150	150	150
					IPT(fz)	.0014	.0017	.0021	.0023	.0025	.0027	.0029
					RPM	2430	1820	1460	1210	910	730	580
					IPM(FEED)	20	19	19	17	14	12	10
	11.1 - 11.2		0.01D	3.0D	SFM(Vc)	100	100	100	100	100	100	100
					IPT(fz)	.0014	.0017	.0019	.0021	.0024	.0026	.0027
					RPM	1620	1210	970	810	610	490	390
					IPM(FEED)	13	12	11	10	9	8	6
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.01D	3.0D	SFM(Vc)	150	150	150	150	150	150	150
					IPT(fz)	.0014	.0017	.0021	.0023	.0025	.0027	.0029
					RPM	2430	1820	1460	1210	910	730	580
					IPM(FEED)	20	19	19	17	14	12	10
H	38.1 - 38.2	Hardened steel	0.05D	3.0D	SFM(Vc)	80	80	80	80	80	80	80
					IPT(fz)	.0012	.0015	.0019	.0021	.0022	.0024	.0026
					RPM	1290	970	780	650	490	390	310
					IPM(FEED)	9	9	9	8	6	6	5
	40	Chilled Cast Iron	0.01D	3.0D	SFM(Vc)	100	100	100	100	100	100	100
					IPT(fz)	.0014	.0017	.0019	.0021	.0024	.0026	.0027
					RPM	1620	1210	970	810	610	490	390
					IPM(FEED)	13	12	11	10	9	8	6
	41	Hardened Cast Iron	0.05D	3.0D	SFM(Vc)	80	80	80	80	80	80	80
					IPT(fz)	.0012	.0015	.0019	.0021	.0022	.0024	.0026
					RPM	1290	970	780	650	490	390	310
					IPM(FEED)	9	9	9	8	6	6	5



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

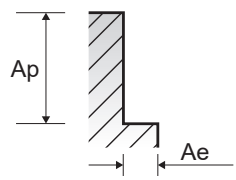
X-POWER PRO END MILLS

RECOMMENDED CUTTING CONDITIONS

GM814 SERIES 3&4 FLUTE ROUGHING - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1015	1000	1000	1035	1035	1035
					IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044
					RPM	16410	12130	9700	8370	6280	5020
					IPM(FEED)	97	96	96	99	99	89
	5		0.3D	1.5D	SFM(Vc)	805	805	820	785	835	785
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015
					RPM	13020	9760	7960	6350	5060	3810
					IPM(FEED)	35	35	35	33	32	24
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	1015	1000	1000	1035	1035	1035
					IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044
					RPM	16410	12130	9700	8370	6280	5020
					IPM(FEED)	97	96	96	99	99	89
	8-9		0.3D	1.5D	SFM(Vc)	805	805	820	785	835	785
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015
					RPM	13020	9760	7960	6350	5060	3810
					IPM(FEED)	35	35	35	33	32	24
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1015	1000	1000	1035	1035	1035
					IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044
					RPM	16410	12130	9700	8370	6280	5020
					IPM(FEED)	97	96	96	99	99	89
	11.1 - 11.2		0.3D	1.5D	SFM(Vc)	805	805	820	785	835	785
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015
					RPM	13020	9760	7960	6350	5060	3810
					IPM(FEED)	35	35	35	33	32	24
M	14.1	Stainless steel	0.3D	1.5D	SFM(Vc)	540	540	560	540	575	525
					IPT(fz)	8733	6549	5434	4366	3487	2547
					RPM	.0009	.0012	.0011	.0013	.0015	.0015
					IPM(FEED)	23.8	23.3	23.9	23.4	21.4	15.2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.3D	1.5D	SFM(Vc)	1015	1000	1000	1035	1035	1035
					IPT(fz)	.0020	.0026	.0025	.0029	.0039	.0044
					RPM	16410	12130	9700	8370	6280	5020
					IPM(FEED)	97	96	96	99	99	89
H	38.1 - 38.2	Hardened steel	0.05D	1.0D	SFM(Vc)	215	215	215	215	215	215
					IPT(fz)	.0010	.0013	.0014	.0015	.0013	.0015
					RPM	3480	2610	2090	1740	1300	1040
					IPM(FEED)	11	10	12	11	7	6
	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	805	805	820	785	835	785
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015
					RPM	13020	9760	7960	6350	5060	3810
					IPM(FEED)	35	35	35	33	32	24
	41	Hardened Cast Iron	0.05D	1.0D	SFM(Vc)	215	215	215	215	215	215
					IPT(fz)	.0010	.0013	.0014	.0015	.0013	.0015
					RPM	3480	2610	2090	1740	1300	1040
					IPM(FEED)	11	10	12	11	7	6



YG

Leading Through Innovation

SOLID CARBIDE

TitaNox-POWER & HPC END MILLS

- High Speed Machining for Exotic Materials: Titanium and Stainless Steels

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE

TitaNox-Power & HPC END MILLS

High Speed Machining for Exotic Materials: Titanium and Stainless Steels

Please visit globalyg1.com/mat for material search

Recommended cutting conditions : p.C552

◎ : Excellent ○ : Good

							Inch		
						SERIES	UGMG42	UGMG43	UGMH12
						FLUTE	4		5
						HELIX ANGLE	43° / 45° (MULTIPLE HELIX)		43°/44°/45° (MULTIPLE HELIX)
						CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	SQUARE
						SIZE MIN	1/4	3/8	1/8
						SIZE MAX	1	1	1-1/4
						PAGE	C542	C543	C544
							DOUBLE CORE STANDARD LENGTH		STANDARD LENGTH
							Y-Coating		Y-Coating

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	1
	2		About 0.45% C	Annealed	190	13	○	○	○	2
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	3
	4		About 0.75% C	Annealed	270	28	○	○	○	4
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	5
	6	Low alloy steel		Annealed	180	10	○	○	○	6
	7			Quenched & Tempered	275	29	○	○	○	7
	8			Quenched & Tempered	300	32	○	○	○	8
	9			Quenched & Tempered	350	38	○	○	○	9
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	10
	11			Quenched & Tempered	325	35	○	○	○	11
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	12
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	13
	14		Austenitic		180	10	◎	◎	◎	14
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	15
	16		Pearlitic (Martensitic)		260	26	○	○	○	16
	17	Nodular cast iron	Ferritic		160	3	○	○	○	17
	18		Pearlitic		250	25	○	○	○	18
	19	Malleable cast iron	Ferritic		130		○	○	○	19
	20		Pearlitic		230	21	○	○	○	20
N	21	Aluminum-wrought alloy	Not Curable		60					21
	22		Curable	Hardened	100					22
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					23
	24		≤ 12% Si, Curable	Hardened	90					24
	25		> 12% Si, Not Curable		130					25
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					26
	27		CuZn, CuSnZn (Brass)		90					27
	28		CuSn, lead-free copper and electrolytic copper		100					28
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							29
	30		Rubber, Wood, etc.							30
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	31
	32			Cured	280	30	○	○	○	32
	33		Ni or Co Based	Annealed	250	25	○	○	○	33
	34			Cured	350	38	○	○	○	34
	35			Cast	320	34	○	○	○	35
	36	Titanium Alloys	Pure Titanium		400 Rm		◎	◎	◎	36
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎	◎	◎	37
H	38	Hardened steel		Hardened	550	55				38
	39			Hardened	630	60				39
	40	Chilled Cast Iron		Cast	400	42				40
	41	Hardened Cast Iron		Hardened	550	55				41

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
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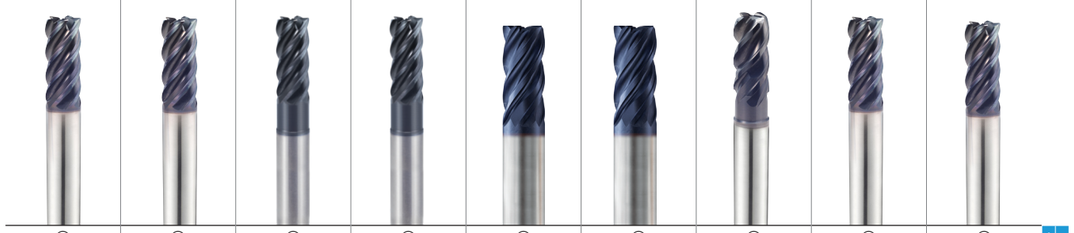
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

							Inch						Metric		
						SERIES	UGMG32	UGMG34	UGMH06	UGMH07	EMI42	EMI43	GMG40	GMG24, GMG26	GMG28, GMG30
						FLUTE	5		5		5		4	5	
						HELIX ANGLE	43°/44°/45° (MULTIPLE HELIX)		43°/44°/45° (MULTIPLE HELIX)		38°		43°/45° (MULTIPLE HELIX)	43°/44°/45° (MULTIPLE HELIX)	
						CUTTING EDGE SHAPE	CHAMFER	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS	CHAMFER	CORNER RADIUS
						SIZE MIN	1/8	1/8	1/8	1/8	1/4	1/4	6.0	6.0	6.0
						SIZE MAX	1	1-1/4	1	1	1	1	25.0	25.0	25.0
						PAGE	C544		C546		C548		C550	C551	
							STANDARD LENGTH		EXTENDED LENGTH		STANDARD LENGTH		EXTENDED LENGTH	STANDARD LENGTH	
							Y-Coating		Y-Coating		AlTiN		Y-Coating	Y-Coating	
											TitaNox-POWER HPC				



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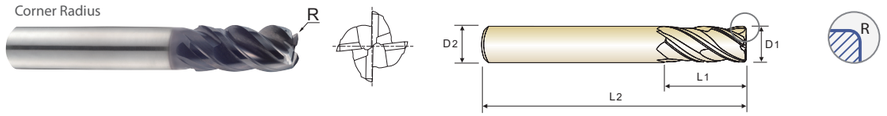
TitaNox-POWER END MILLS

CORNER RADIUS **UGMG42 SERIES**

CARBIDE, 4 FLUTE DOUBLE CORE STANDARD LENGTH

- Double core end mill has a unique flute design for excellent chip evacuation and higher rigidity.
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy.



CARBIDE | 4 | 43°/45° | PLAIN | Y Coating | p.C552

Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Corner Radius .010 EDP No.	.015 EDP No.	.030 EDP No.	.060 EDP No.	.090 EDP No.	.125 EDP No.	.190 EDP No.	.250 EDP No.
1/4	1/4	9/16	2-1/2	UGMG42802	UGMG42016	UGMG42901	UGMG42902	-	-	-	-
		3/4	2-1/2	-	-	UGMG42924	UGMG42925	-	-	-	-
		1	3	-	-	UGMG42S926*	UGMG42S927*	-	-	-	-
3/8	3/8	1/2	2-1/2	-	-	UGMG42K998	UGMG42K999	UGMG42K801	-	-	-
		7/8	2-1/2	-	-	UGMG42928	UGMG42929	UGMG42930	-	-	-
		13/16	2-1/2	UGMG42931	-	UGMG42905	UGMG42906	UGMG42907	-	-	-
		1	3	UGMG42932	UGMG42803	UGMG42933	UGMG42934	UGMG42935	-	-	-
		1-1/4	3	UGMG42S936*	UGMG42S804*	UGMG42S937*	UGMG42S938*	UGMG42S939*	-	-	-
1/2	1/2	1	3	UGMG42940	-	UGMG42908	UGMG42909	UGMG42910	UGMG42911	-	-
		1-1/4	3	UGMG42810	UGMG42811	UGMG42813	UGMG42815	UGMG42816	UGMG42817	-	-
		1-1/4	3-1/2	-	UGMG42805	UGMG42912	UGMG42941	UGMG42942	UGMG42943	-	-
		1-5/8	4	-	-	UGMG42S944*	UGMG42S945*	UGMG42S946*	UGMG42S947*	-	-
		2	4	-	-	UGMG42S806*	UGMG42S807*	UGMG42S808*	UGMG42S809*	-	-
5/8	5/8	1-1/4	3-1/2	-	-	UGMG42040	UGMG42913	UGMG42914	UGMG42915	-	-
		1-5/8	4	-	-	UGMG42948	UGMG42949	UGMG42950	UGMG42951	-	-
		2	4	-	-	UGMG42S952*	UGMG42S953*	UGMG42S954*	UGMG42S955*	-	-
		3-1/4	6	-	-	UGMG42S956*	UGMG42S957*	UGMG42S958*	UGMG42S959*	-	-
3/4	3/4	1-1/2	4	-	-	UGMG42048	UGMG42916	UGMG42917	UGMG42918	UGMG42919	UGMG42960
		1-7/8	4	-	-	UGMG42961	UGMG42962	UGMG42963	UGMG42964	UGMG42965	UGMG42966
		2-1/4	5	-	-	UGMG42967	UGMG42968	UGMG42969	UGMG42970	UGMG42971	UGMG42972
		3-1/4	6	-	-	UGMG42S973*	UGMG42S974*	UGMG42S975*	UGMG42S976*	UGMG42S977*	UGMG42S978*
1	1	2	5	-	-	UGMG42064	UGMG42920	UGMG42921	UGMG42922	UGMG42923	UGMG42979
		2-5/8	5	-	-	UGMG42980	UGMG42981	UGMG42982	UGMG42983	UGMG42984	UGMG42985
		3	6	-	-	UGMG42986	UGMG42987	UGMG42988	UGMG42989	UGMG42990	UGMG42991
		4-1/4	7	-	-	UGMG42S992*	UGMG42S993*	UGMG42S994*	UGMG42S995*	UGMG42S996*	UGMG42S997*

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6

* Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD on 45° single-helix.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

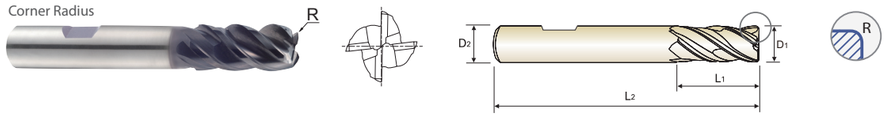
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

CORNER RADIUS **UGMG43 SERIES**

CARBIDE, 4 FLUTE STANDARD LENGTH

- Double core end mill has a unique flute design for excellent chip evacuation and higher rigidity.
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy.

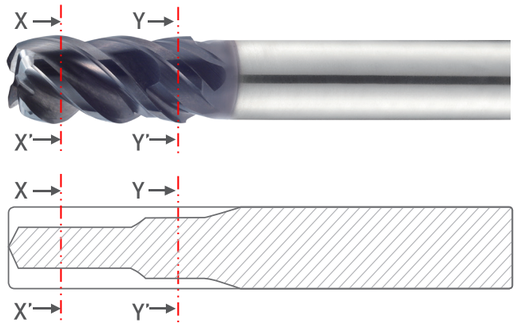


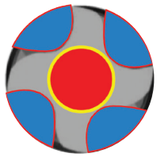
CARBIDE | 4 | 43°/45° | FLAT | Y Coating | p.C552

Unit : Inch

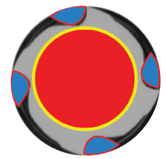
OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Corner Radius .010 EDP No.	.030 EDP No.	.060 EDP No.	.090 EDP No.	.125 EDP No.	.190 EDP No.
3/8	3/8	13/16	2-1/2	UGMG43024	UGMG43905	UGMG43906	UGMG43907	-	-
1/2	1/2	1	3	-	UGMG43908	UGMG43909	UGMG43910	UGMG43911	-
		1-1/4	3	-	UGMG43926	UGMG43927	UGMG43928	UGMG43929	-
		1-1/4	3-1/2	-	UGMG43912	UGMG43924	UGMG43930	UGMG43931	-
5/8	5/8	1-1/4	3-1/2	-	UGMG43040	UGMG43913	UGMG43914	UGMG43915	-
3/4	3/4	1-1/2	4	-	UGMG43048	UGMG43916	UGMG43917	UGMG43818	UGMG43919
1	1	2	5	-	UGMG43064	UGMG43920	UGMG43921	UGMG43922	UGMG43923

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6





SECTION X-X'
Excellent chip evacuation



SECTION Y-Y'
Higher rigidity

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

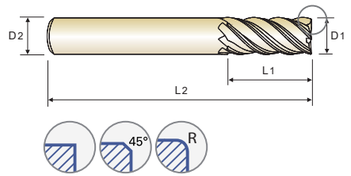
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

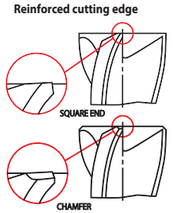
TitaNox-POWER END MILLS

SQUARE **UGMH12 SERIES**
CHAMFER **UGMG32 SERIES**
CORNER RADIUS **UGMG34 SERIES**

CARBIDE, 5 FLUTE STANDARD LENGTH

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
- Special roughing profile for machining Titanium and Titanium Alloys.
- Longer tool life with special coating.





CARBIDE | 5 | 43°/44°/45° | PLAIN | C x 45° | Y Coating

p.C554

Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square	Chamfer	Corner Radius .015	.030	.060	.090	.125
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/8	1/8	1/4	1-1/2	UGMH12008	UGMG32008	UGMG34008	UGMG34950	-	-	-
		3/8	1-1/2	UGMH12901	UGMG32901	UGMG34901	UGMG34951	-	-	-
		1/2	2-1/2	UGMH12S902*	-	UGMG34S952*	UGMG34S953*	-	-	-
		3/4	2-1/2	UGMH12S903*	-	UGMG34S954*	UGMG34S955*	-	-	-
3/16	3/16	5/16	2	UGMH12012	UGMG32012	UGMG34012	UGMG34956	-	-	-
		9/16	2	UGMH12904	UGMG32902	UGMG34902	UGMG34957	-	-	-
		3/4	2-1/2	UGMH12S905*	-	UGMG34S958*	UGMG34S959*	-	-	-
1/4	1/4	3/8	2	UGMH12016	UGMG32016	UGMG34960	UGMG34016	UGMG34961	-	-
		1/2	2-1/2	UGMH12906	-	UGMG34962	UGMG34963	UGMG34964	-	-
		3/4	2-1/2	UGMH12907	UGMG32903	UGMG34903	UGMG34904	UGMG34905	-	-
		1	3	UGMH12S908*	-	UGMG34S965*	UGMG34S966*	UGMG34S967*	-	-
		1-1/4	3	UGMH12S909*	-	UGMG34S968*	UGMG34S969*	UGMG34S970*	-	-
5/16	5/16	7/16	2	UGMH12020	UGMG32020	UGMG34971	UGMG34020	UGMG34972	-	-
		13/16	2-1/2	UGMH12910	UGMG32904	UGMG34906	UGMG34907	UGMG34908	-	-
		1	3	UGMH12S911*	-	UGMG34S973*	UGMG34S974*	UGMG34S975*	-	-
3/8	3/8	1/2	2-1/2	UGMH12024	UGMG32024	UGMG34976	UGMG34024	UGMG34909	UGMG34977	-
		1	3	UGMH12912	UGMG32905	UGMG34910	UGMG34911	UGMG34912	UGMG34978	-
		1-1/4	3	UGMH12S913*	-	UGMG34S979*	UGMG34S980*	UGMG34S981*	UGMG34S982*	-
		1-1/2	4	UGMH12S914*	-	UGMG34S983*	UGMG34S984*	UGMG34S985*	UGMG34S986*	-
1/2	1/2	5/8	2-1/2	UGMH12032	UGMG32032	UGMG34032	UGMG34913	UGMG34914	UGMG34987	UGMG34988
		1	3	UGMH12915	UGMG32906	UGMG34915	UGMG34916	UGMG34917	UGMG34918	UGMG34919
		1-1/4	3-1/2	UGMH12916	UGMG32907	UGMG34920	UGMG34921	UGMG34922	UGMG34923	UGMG34924
		1-5/8	4	UGMH12S917*	-	UGMG34S989*	UGMG34S990*	UGMG34S991*	UGMG34S992*	UGMG34S993*
		2	4	UGMH12S918*	-	UGMG34S994*	UGMG34S995*	UGMG34S996*	UGMG34S997*	UGMG34S998*

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6

*Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD on 45° single-helix.

NEXT PAGE ▶

CHAMFER KEY
UGMG32

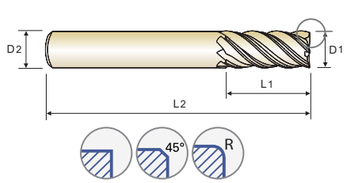
Mill Diameter (in.)	Chamfer Size
1/8	.004
3/16	.006
1/4	.007
5/16	.007
3/8	.011
1/2	.015
5/8	.015
3/4	.019
1	.019

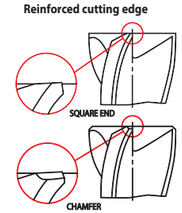
◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS
SQUARE UGMH12 SERIES
CHAMFER UGMG32 SERIES
CORNER RADIUS UGMG34 SERIES
CARBIDE, 5 FLUTE STANDARD LENGTH
▶ Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
▶ Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
▶ Special roughing profile for machining Titanium and Titanium Alloys.
▶ Longer tool life with special coating.





CARBIDE | 5 | 43°/44°/45° | PLAIN | C x 45° | Y Coating

p.C554

Unit : Inch

OD (D1)	SD (D2)	LOC (L1)	OAL (L2)	Square	Chamfer	Corner Radius .015	.030	.060	.090	.125	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
5/8	5/8	3/4	3	UGMH12040	UGMG32040	-	UGMG34040	UGMG34925	UGMG34999	UGMG34801	-	-
		1-1/4	3-1/2	UGMH12919	UGMG32908	UGMG34926	UGMG34927	UGMG34928	UGMG34929	UGMG34930	-	-
		1-5/8	4	UGMH12920	-	-	UGMG34802	UGMG34803	UGMG34804	UGMG34805	-	-
		2-1/8	4-1/2	UGMH12S921*	-	-	UGMG34S806*	UGMG34S807*	UGMG34S808*	UGMG34S809*	-	-
		2-1/2	5	UGMH12S922*	-	-	UGMG34S810*	UGMG34S811*	UGMG34S812*	UGMG34S813*	-	-
3/4	3/4	1	3-1/2	UGMH12048	UGMG32048	-	UGMG34048	UGMG34931	UGMG34932	UGMG34814	UGMG34815	UGMG34816
		1-1/2	4	UGMH12923	UGMG32909	UGMG34933	UGMG34934	UGMG34935	UGMG34936	UGMG34937	UGMG34938	UGMG34817
		1-7/8	5	UGMH12924	-	-	UGMG34818	UGMG34819	UGMG34820	UGMG34821	UGMG34822	UGMG34823
		2-1/4	5	UGMH12925	-	-	UGMG34824	UGMG34825	UGMG34826	UGMG34827	UGMG34828	UGMG34829
		2-3/4	5	UGMH12S926*	-	-	UGMG34S830*	UGMG34S831*	UGMG34S832*	UGMG34S833*	UGMG34S834*	UGMG34S835*
		3-1/4	6	UGMH12S927*	-	-	UGMG34S836*	UGMG34S837*	UGMG34S838*	UGMG34S839*	UGMG34S840*	UGMG34S841*
1	1	1-1/8	4	UGMH12064	UGMG32064	-	UGMG34064	UGMG34939	UGMG34940	UGMG34842	UGMG34843	UGMG34844
		1-1/2	4	UGMH12928	UGMG32910	UGMG34941	UGMG34942	UGMG34943	UGMG34944	UGMG34945	UGMG34946	UGMG34845
		2	5	UGMH12929	UGMG32911	-	UGMG34947	UGMG34948	UGMG34949	UGMG34846	UGMG34847	UGMG34848
		2-5/8	5	UGMH12930	-	-	UGMG34849	UGMG34850	UGMG34851	UGMG34852	UGMG34853	UGMG34854
		3-1/4	6	UGMH12S931*	-	-	UGMG34S855*	UGMG34S856*	UGMG34S857*	UGMG34S858*	UGMG34S859*	UGMG34S860*
		4-1/4	7	UGMH12S932*	-	-	UGMG34S861*	UGMG34S862*	UGMG34S863*	UGMG34S864*	UGMG34S865*	UGMG34S866*
1-1/4	1-1/4	1-1/2	4-1/2	UGMH12116	-	-	-	UGMG34116	UGMG34867	UGMG34868	UGMG34869	UGMG34870
		2	4-1/2	UGMH12933	-	-	-	UGMG34871	UGMG34872	UGMG34873	UGMG34874	UGMG34875
		2-5/8	5-1/2	UGMH12934	-	-	-	UGMG34876	UGMG34877	UGMG34878	UGMG34879	UGMG34880
		3-1/4	6	UGMH12935	-	-	-	UGMG34881	UGMG34882	UGMG34883	UGMG34884	UGMG34885
		4-1/2	7	UGMH12S936*	-	-	-	UGMG34S886*	UGMG34S887*	UGMG34S888*	UGMG34S889*	UGMG34S890*

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6

*Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD on 45° single-helix.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

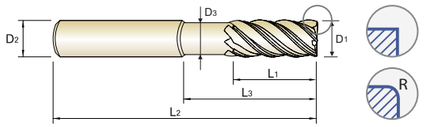
SQUARE **UGMH06 SERIES**
CORNER RADIUS **UGMH07 SERIES**

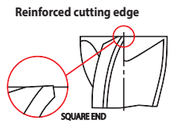
CARBIDE, 5 FLUTE EXTENDED LENGTH

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
- Special roughing profile for machining Titanium and Titanium Alloys.
- Longer tool life with special coating.

Square

Corner Radius





CARBIDE | 5 | 43°/44°/45° | PLAIN | Y Coating | p.C554

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Square	Corner Radius .030	.060	.090	.125	.190	.250
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/8	1/8	5/32	3/8	3	.113	UGMH06008	UGMH07008	-	-	-	-	-
		5/32	1/2	3	.113	UGMH06901	UGMH07901	-	-	-	-	-
		5/32	5/8	3	.113	UGMH06902	UGMH07902	-	-	-	-	-
3/16	3/16	7/32	1/2	3	.176	UGMH06012	UGMH07012	-	-	-	-	-
		7/32	3/4	3	.176	UGMH06903	UGMH07903	-	-	-	-	-
		7/32	1	3	.176	UGMH06904	UGMH07904	-	-	-	-	-
1/4	1/4	3/8	3/4	4	.230	UGMH06016	UGMH07016	UGMH07905	-	-	-	-
		3/8	1-1/8	4	.230	UGMH06905	UGMH07906	UGMH07907	-	-	-	-
		3/8	2-1/8	4	.230	UGMH06906	UGMH07908	UGMH07909	-	-	-	-
3/8	3/8	1/2	1-1/8	4	.344	UGMH06024	UGMH07024	UGMH07910	UGMH07911	-	-	-
		1/2	2-1/8	4	.344	UGMH06907	UGMH07912	UGMH07913	UGMH07914	-	-	-
		1/2	3-1/8	5	.344	UGMH06923	UGMH07804	UGMH07805	UGMH07806	-	-	-
		1/2	3-1/8	6	.344	UGMH06908	UGMH07915	UGMH07916	UGMH07917	-	-	-
		1/2	4-1/8	6	.344	UGMH06909	UGMH07918	UGMH07919	UGMH07920	-	-	-
1/2	1/2	5/8	1-1/2	4	.461	UGMH06032	UGMH07032	UGMH07921	UGMH07922	UGMH07923	-	-
		5/8	2-1/4	4	.461	UGMH06910	UGMH07924	UGMH07925	UGMH07926	UGMH07927	-	-
		5/8	3-3/8	5	.461	UGMH06924	UGMH07807	UGMH07808	UGMH07809	UGMH07810	-	-
		5/8	3-3/8	6	.461	UGMH06911	UGMH07928	UGMH07929	UGMH07930	UGMH07931	-	-
		5/8	4-1/8	6	.461	UGMH06912	UGMH07932	UGMH07933	UGMH07934	UGMH07935	-	-
5/8	5/8	3/4	1-5/8	4	.586	UGMH06040	UGMH07040	UGMH07936	UGMH07937	UGMH07938	-	-
		3/4	2-3/8	6	.586	UGMH06913	UGMH07939	UGMH07940	UGMH07941	UGMH07942	-	-
		3/4	3-3/8	6	.586	UGMH06914	UGMH07943	UGMH07944	UGMH07945	UGMH07946	-	-
		3/4	4-1/8	6	.586	UGMH06915	UGMH07947	UGMH07948	UGMH07949	UGMH07950	-	-

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6

Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

NEXT PAGE ▶

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

TitaNox-POWER END MILLS

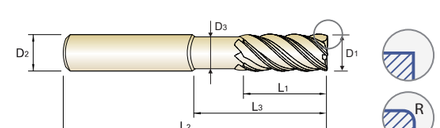
SQUARE UGMH06 SERIES
CORNER RADIUS UGMH07 SERIES

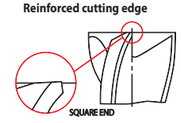
CARBIDE, 5 FLUTE EXTENDED LENGTH

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
- Special roughing profile for machining Titanium and Titanium Alloys.
- Longer tool life with special coating.

Square

Corner Radius





CARBIDE | 5 | 43°/44°/45° | PLAIN | Y Coating | p.C554

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Square	Corner Radius .030	.060	.090	.125	.190	.250
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/4	3/4	1-1/8	2	4	.711	UGMH06048	UGMH07048	UGMH07951	UGMH07952	UGMH07953	UGMH07954	UGMH07955
		1-1/8	2-5/8	5	.711	UGMH06916	UGMH07956	UGMH07957	UGMH07958	UGMH07959	UGMH07960	UGMH07961
		1-1/8	3-1/4	6	.711	UGMH06917	UGMH07962	UGMH07963	UGMH07964	UGMH07965	UGMH07966	UGMH07967
		1-1/8	4-1/4	7	.711	UGMH06918	UGMH07968	UGMH07969	UGMH07970	UGMH07971	UGMH07972	UGMH07973
1	1	1-1/4	2-1/4	4	.961	UGMH06064	UGMH07064	UGMH07974	UGMH07975	UGMH07976	UGMH07977	UGMH07978
		1-1/4	2-5/8	5	.961	UGMH06919	UGMH07979	UGMH07980	UGMH07981	UGMH07982	UGMH07983	UGMH07984
		1-1/4	3-1/4	6	.961	UGMH06920	UGMH07985	UGMH07986	UGMH07987	UGMH07988	UGMH07989	UGMH07990
		1-1/4	4-1/4	7	.961	UGMH06921	UGMH07991	UGMH07992	UGMH07993	UGMH07994	UGMH07995	UGMH07996
		1-1/4	5-1/4	8	.961	UGMH06922	UGMH07997	UGMH07998	UGMH07999	UGMH07801	UGMH07802	UGMH07803

Mill Dia.Tolerance(in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6

Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

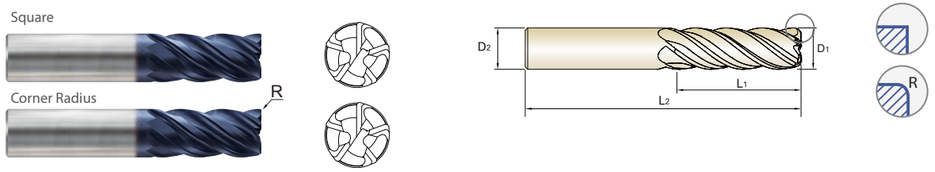
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

TitaNox-POWER HPC END MILLS

SQUARE **EMI42 SERIES**
CORNER RADIUS **EMI43 SERIES**

CARBIDE, 5 FLUTE STANDARD LENGTH - *TitaNox-POWER HPC*

- New design enhances chip space in heavy cuts, while still maintaining rigidity in peel milling.
- Unequal index design for Chatter-Free cutting
- high performance milling of Stainless Steel, Titanium, and Heat-Resistant Super Alloys



CARBIDE | 5 | 38° | PLAIN | AlTiN

p.C555

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square ●	Corner Radius .015	.030	.060	.090	.125	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/4	1/4	3/8	2	EMI42016	EMI43016	EMI43901	EMI43902	-	-	-	-
		1/2	2-1/2	EMI42901	EMI43903	EMI43904	EMI43905	-	-	-	-
		3/4	2-1/2	EMI42902	EMI43906	EMI43907	EMI43908	-	-	-	-
5/16	5/16	7/16	2	EMI42020	EMI43020	EMI43909	-	-	-	-	-
		13/16	2-1/2	EMI42903	EMI43910	EMI43911	-	-	-	-	-
3/8	3/8	1/2	2-1/2	EMI42024	EMI43024	EMI43912	EMI43913	EMI43914	-	-	-
		1	3	EMI42904	EMI43915	EMI43916	EMI43917	EMI43918	-	-	-
		1-1/4	3	EMI42905	EMI43919	EMI43920	EMI43921	EMI43922	-	-	-
1/2	1/2	5/8	2-1/2	EMI42032	EMI43032	EMI43923	EMI43924	EMI43925	EMI43926	-	-
		1	3	EMI42906	EMI43927	EMI43928	EMI43929	EMI43930	EMI43931	-	-
		1-1/4	3	EMI42907	EMI43932	EMI43933	EMI43934	EMI43935	EMI43936	-	-
		1-5/8	4	EMI42908	EMI43937	EMI43938	EMI43939	EMI43940	EMI43941	-	-
5/8	5/8	3/4	3	EMI42040	-	EMI43040	EMI43942	EMI43943	EMI43944	-	-
		1-1/4	3-1/2	EMI42909	EMI43945	EMI43946	EMI43947	EMI43948	EMI43949	-	-
		1-5/8	4	EMI42910	-	EMI43950	EMI43951	EMI43952	EMI43953	-	-
		2-1/8	4-1/2	EMI42911	-	EMI43954	EMI43955	EMI43956	EMI43957	-	-
3/4	3/4	1	3-1/2	EMI42048	-	EMI43048	EMI43958	EMI43959	EMI43960	EMI43961	-
		1-1/2	4	EMI42912	EMI43962	EMI43963	EMI43964	EMI43965	EMI43966	EMI43967	EMI43968
		1-5/8	5	EMI42913	-	EMI43969	EMI43802	EMI43970	EMI43973	EMI43971	EMI43972
		2-1/4	5	EMI42914	EMI43974	EMI43975	EMI43976	EMI43977	EMI43978	EMI43979	EMI43980

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6

Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

- TitaNox-Power HPC Square Tools are designed with a true sharp corner while TitaNox-Power Square tools feature a dubbed corner for extra protection

NEXT PAGE ▶

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

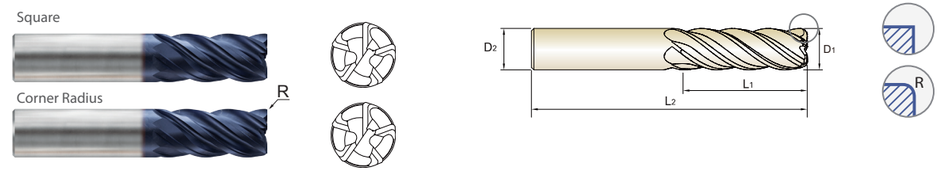
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎	◎	◎				

TitaNox-POWER HPC END MILLS

SQUARE EMI42 SERIES
CORNER RADIUS EMI43 SERIES

CARBIDE, 5 FLUTE STANDARD LENGTH - TitaNox-POWER HPC

- New design enhances chip space in heavy cuts, while still maintaining rigidity in peel milling.
- Unequal index design for Chatter-Free cutting
- high performance milling of Stainless Steel, Titanium, and Heat-Resistant Super Alloys



CARBIDE | 5 | 38° | PLAIN | AlTiN

p.C555

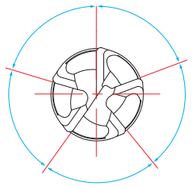
Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square ●	Corner Radius .015	.030	.060	.090	.125	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1	1	1-1/8	4	EMI42064	-	-	EMI43064	-	EMI43981	-	-
		1-1/2	4	EMI42915	EMI43982	EMI43983	EMI43984	-	EMI43985	-	-
		2	5	EMI42916	EMI43986	EMI43987	EMI43988	EMI43989	EMI43990	-	EMI43991
		2-5/8	5	EMI42917	-	EMI43992	EMI43993	-	EMI43994	-	EMI43995
		3-1/4	6	EMI42918	-	EMI43996	EMI43997	EMI43998	EMI43999	-	EMI43801

Mill Dia.Tolerance (in)	Shank Dia.Tolerance
0 ~ - .0012	h5 * Shank Dia.≥Ø1/2 : h6

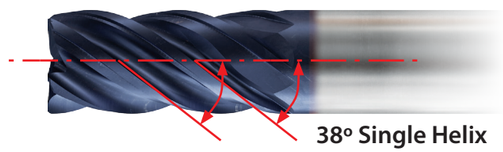
Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD

- TitaNox-Power HPC Square Tools are designed with a true sharp corner while TitaNox-Power Square tools feature a dubbed corner for extra protection



Unequal Index

Exclusively Designed Unique Geometry applied to Reduce Vibration and also to achieve Excellent surface finish



Core Design

YG-1's High Performance Core Geometries is designed for superior chip evacuation. It's excellent at Slotting & Heavy Profiling.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

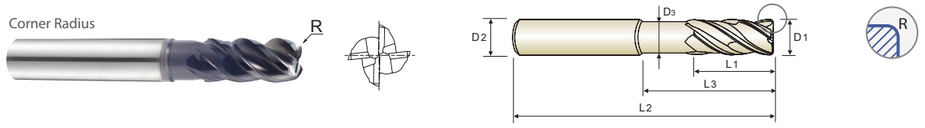
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											◎	◎	◎	◎	◎	◎	◎				

TitaNox-POWER END MILLS

CORNER RADIUS **GMG40 SERIES**

CARBIDE, 4 FLUTE DOUBLE CORE EXTENDED LENGTH

- Double core end mill has a unique flute design for excellent chip evacuation and higher rigidity.
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy.



CARBIDE | 4 | 43°/45° | PLAIN | Y Coating | p.C558

Unit : mm

OD (D1) Metric	OD (D1) Inch	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Corner Radius 0.50	1.00	1.50	2.00	3.00	3.50	4.00
							EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6	.2362	6	13	20	57	5.5	GMG40060	GMG40901	-	-	-	-	-
8	.3150	8	19	25	63	7.5	GMG40080	GMG40902	GMG40903	GMG40904	-	-	-
10	.3937	10	22	30	72	9.2	GMG40100	GMG40905	GMG40906	GMG40907	-	-	-
12	.4724	12	26	35	83	11.0	GMG40120	GMG40908	GMG40909	GMG40910	GMG40911	-	-
14	.5512	14	26	35	83	13.0	-	GMG40140	-	GMG40912	-	-	-
16	.6299	16	35	43	92	15.0	-	GMG40160	GMG40913	GMG40914	GMG40915	-	GMG40916
20	.7874	20	44	56	110	19.0	-	GMG40200	GMG40917	GMG40918	GMG40919	GMG40920	GMG40921
25	.9843	25	55	70	130	24.0	-	GMG40250	GMG40922	GMG40923	GMG40924	-	GMG40925

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

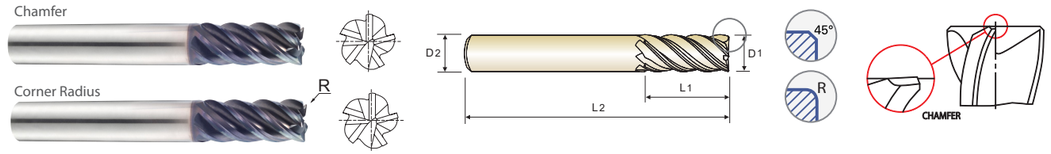
TitaNox-POWER END MILLS

CHAMFER **GMG24, GMG26 SERIES**

CORNER RADIUS **GMG28, GMG30 SERIES**

CARBIDE, 5 FLUTE EXTENDED LENGTH

- Suitable for Titanium, Titanium Alloys, Inconel and Stainless Steels.
- Optimized flute design for chip evacuation and rigidity when machining difficult-to-cut materials.
- Special roughing profile for machining Titanium and Titanium Alloys.
- Longer tool life with special coating.



CARBIDE | 5 | 43°/44°/45° | C x 45° | PLAIN | Y Coating | p.C560

Unit : mm

OD (D1) Metric	OD (D1) Inch	SD (D2)	LOC (L1)	OAL (L2)	Chamfer	Corner Radius 0.30	0.50	1.00	1.50	2.00	2.50	3.00	4.00	5.00
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6	.2362	6	10	54	GMG24060	-	GMG28060	-	-	-	-	-	-	-
		6	13	57	GMG26060	GMG30060	GMG30901	GMG30902	-	-	-	-	-	-
8	.3150	8	12	58	GMG24080	-	GMG28080	-	-	-	-	-	-	-
		8	19	63	GMG26080	-	GMG30080	GMG30903	GMG30904	GMG30905	-	-	-	-
10	.3937	10	14	66	GMG24100	-	GMG28100	-	-	-	-	-	-	-
		10	22	72	GMG26100	-	GMG30100	GMG30906	GMG30907	GMG30908	-	-	-	-
12	.4724	12	16	73	GMG24120	-	GMG28120	-	-	-	-	-	-	-
		12	26	83	GMG26120	-	GMG30120	GMG30909	GMG30910	GMG30911	GMG30912	GMG30913	-	-
16	.6299	16	22	82	GMG24160	-	-	GMG28160	-	-	-	-	-	-
		16	36	92	GMG26160	-	-	GMG30160	GMG30914	GMG30915	GMG30916	GMG30917	GMG30918	-
20	.7874	20	26	92	GMG24200	-	-	GMG28200	-	-	-	-	-	-
		20	44	104	GMG26200	-	-	GMG30200	GMG30919	GMG30920	GMG30921	GMG30922	GMG30923	GMG30924
25	.9843	25	29	100	GMG24250	-	-	GMG28250	-	-	-	-	-	-
		25	54	121	GMG26250	-	-	GMG30250	GMG30925	GMG30926	GMG30927	GMG30928	GMG30929	GMG30930

Mill Dia.Tolerance (mm)	Shank Dia.Tolerance
0 ~ - 0.03	h5 * Shank Dia.≥Ø12 : h6

CHAMFER KEY GMG24 | GMG26

Mill Diameter Metric	Mill Diameter Inch	Chamfer Size (mm)
6	.2362	0.20
8	.315	0.20
10	.3937	0.30
12	.4724	0.35
16	.6299	0.40
20	.7478	0.50
25	.9843	0.50

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

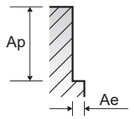
TitaNox-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

UGMG42, UGMG43 SERIES — 4 FLUTE DOUBLE CORE - Side Cutting

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-5	Non-alloy steel	0.4D	1.0D (0.7D)*	SFM(Vc)	525	525	525	525	525	525	525
					IPT(fz)	.0011	.0014	.0017	.0021	.0025	.0030	.0033
					RPM	8020	6420	5350	4010	3210	2670	2010
					IPM(FEED)	35	36	36	34	32	32	27
	6-8	Low alloy steel	0.4D	1.0D (0.7D)*	SFM(Vc)	525	525	525	525	525	525	525
					IPT(fz)	.0011	.0014	.0017	.0021	.0025	.0030	.0033
					RPM	8020	6420	5350	4010	3210	2670	2010
					IPM(FEED)	35	36	36	34	32	32	27
	9		0.4D	1.0D (0.7D)*	SFM(Vc)	490	490	490	490	490	490	490
					IPT(fz)	.0010	.0014	.0017	.0019	.0025	.0028	.0033
					RPM	7490	5990	4990	3740	2990	2500	1870
					IPM(FEED)	30	34	34	28	30	28	25
	10	High alloyed steel, and tool steel	0.4D	1.0D (0.7D)*	SFM(Vc)	490	490	490	490	490	490	490
					IPT(fz)	.0011	.0014	.0018	.0021	.0026	.0030	.0033
					RPM	7490	5990	4990	3740	2990	2500	1870
					IPM(FEED)	33	34	36	31	31	30	25
	11.1		0.4D	1.0D (0.7D)*	SFM(Vc)	490	490	490	490	490	490	490
					IPT(fz)	.0010	.0014	.0017	.0019	.0025	.0028	.0033
					RPM	7490	5990	4990	3740	2990	2500	1870
					IPM(FEED)	30	34	34	28	30	28	25
M	12-13	Stainless steel	0.4D	1.0D (0.7D)	SFM(Vc)	510	510	510	510	510	510	510
					IPT(fz)	.0013	.0018	.0022	.0026	.0034	.0037	.0045
					RPM	7790	6230	5190	3900	3120	2600	1950
					IPM(FEED)	41	45	46	41	42	38	35
	14.1		0.4D	1.0D (0.7D)*	SFM(Vc)	345	345	345	345	345	345	345
					IPT(fz)	.0010	.0013	.0016	.0019	.0024	.0028	.0032
					RPM	5270	4220	3510	2640	2110	1760	1320
					IPM(FEED)	21	22	22	20	20	20	17
	14.2		0.4D	0.6D	SFM(Vc)	145	145	145	145	145	145	145
					IPT(fz)	.0006	.0008	.0010	.0013	.0016	.0018	.0021
					RPM	2220	1770	1480	1110	890	740	550
					IPM(FEED)	5	6	6	6	6	5	5
K	15-20	Grey cast iron	0.4D	1.0D (0.7D)*	SFM(Vc)	575	575	575	575	575	575	575
					IPT(fz)	.0008	.0011	.0014	.0017	.0021	.0024	.0028
					RPM	8790	7030	5860	4390	3510	2930	2200
					IPM(FEED)	28	31	33	30	29	28	25
S	31-35	Heat Resistant Super Alloys	0.3D	0.6D	SFM(Vc)	105	105	105	105	105	105	105
					IPT(fz)	.0008	.0010	.0013	.0015	.0019	.0022	.0026
					RPM	1600	1280	1070	800	640	530	400
					IPM(FEED)	5	5	6	5	5	5	4
	36-37	Titanium Alloys	0.4D	1.0D (0.7D)*	SFM(Vc)	230	230	230	230	230	230	230
					IPT(fz)	.0013	.0019	.0022	.0026	.0034	.0037	.0045
					RPM	3510	2810	2340	1760	1410	1170	880
					IPM(FEED)	18	21	21	18	19	17	16



NOTES:
- Maximum recommended depth shown
- Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
- Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD
- Reduce speed and feed recommendations for materials harder than listed
- Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

* (0.7D): UGMG42K998, UGMG42K999, UGMGK801
0.7D cutting depth for slotting and side cutting applications due to short double-core length

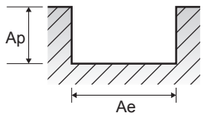
TitaNox-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

UGMG42, UGMG43 SERIES — 4 FLUTE DOUBLE CORE - Slotting

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-5	Non-alloy steel	1.0D	1.0D (0.7D)*	SFM(Vc)	410	410	410	410	410	410	410
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0033
					RPM	6260	5010	4180	3130	2510	2090	1570
					IPM(FEED)	25	26	28	24	25	23	21
	6-8	Low alloy steel	1.0D	1.0D (0.7D)*	SFM(Vc)	410	410	410	410	410	410	410
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0033
					RPM	6260	5010	4180	3130	2510	2090	1570
					IPM(FEED)	25	26	28	24	25	23	21
	9		1.0D	1.0D (0.7D)*	SFM(Vc)	395	395	395	395	395	395	395
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0030
					RPM	6040	4830	4020	3020	2410	2010	1510
					IPM(FEED)	24	25	27	23	24	23	18
	10	High alloyed steel, and tool steel	1.0D	1.0D (0.7D)*	SFM(Vc)	410	410	410	410	410	410	410
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0033
					RPM	6260	5010	4180	3130	2510	2090	1570
					IPM(FEED)	25	26	28	24	25	23	21
	11.1		1.0D	1.0D (0.7D)*	SFM(Vc)	395	395	395	395	395	395	395
					IPT(fz)	.0010	.0013	.0017	.0019	.0025	.0028	.0030
					RPM	6040	4830	4020	3020	2410	2010	1510
					IPM(FEED)	24	25	27	23	24	23	18
M	12-13	Stainless steel	1.0D	1.0D (0.7D)	SFM(Vc)	410	410	410	410	410	410	410
					IPT(fz)	.0013	.0018	.0022	.0026	.0032	.0037	.0041
					RPM	6260	5010	4180	3130	2510	2090	1570
					IPM(FEED)	33	36	37	33	32	31	26
	14.1		1.0D	1.0D (0.7D)*	SFM(Vc)	280	280	280	280	280	280	280
					IPT(fz)	.0010	.0013	.0016	.0019	.0024	.0028	.0032
					RPM	4280	3420	2850	2140	1710	1430	1070
					IPM(FEED)	17	18	18	16	16	16	14
	14.2		1.0D	0.5D	SFM(Vc)	120	120	120	120	120	120	120
					IPT(fz)	.0006	.0008	.0010	.0013	.0016	.0018	.0021
					RPM	1830	1470	1220	920	730	610	460
					IPM(FEED)	4	5	5	5	5	4	4
K	15-20	Grey cast iron	1.0D	1.0D (0.7D)*	SFM(Vc)	460	460	460	460	460	460	460
					IPT(fz)	.0008	.0011	.0014	.0017	.0021	.0024	.0026
					RPM	7030	5620	4690	3510	2810	2340	1760
					IPM(FEED)	22	25	26	24	24	22	18
S	31-35	Heat Resistant Super Alloys	1.0D	0.4D	SFM(Vc)	80	80	80	80	80	80	80
					IPT(fz)	.0007	.0009	.0012	.0014	.0017	.0020	.0022
					RPM	1220	980	810	610	490	410	310
					IPM(FEED)	3	4	4	3	3	3	3
	36-37	Titanium Alloys	1.0D	1.0D (0.7D)*	SFM(Vc)	180	180	180	180	180	180	180
					IPT(fz)	.0013	.0018	.0022	.0026	.0034	.0037	.0041
					RPM	2750	2200	1830	1380	1100	920	690
					IPM(FEED)	14	16	16	14	15	14	11



NOTES:
- Maximum recommended depth shown
- Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
- Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD
- Reduce speed and feed recommendations for materials harder than listed
- Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

* (0.7D): UGMG42K998, UGMG42K999, UGMGK801
0.7D cutting depth for slotting and side cutting applications due to short double-core length

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

TitaNox-POWER END MILLS

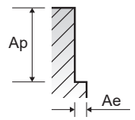
RECOMMENDED CUTTING CONDITIONS

UGMH12, UGMG32, UGMG34, UGMH06, UGMH07 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

5 FLUTE - Side Cutting

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	3/4	1	1-1/4
P	1-5	Non-alloy steel	0.3D	1.5D	SFM(Vc)	470	470	470	470	470	470	470	470	470	470	470	470
					IPT(fz)	.0004	.0007	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	.0046
					RPM	14360	9570	7180	5740	4790	3590	3190	2870	2610	2390	1800	1440
					IPM(FEED)	29	33	47	43	48	45	43	43	43	42	36	33
	6-8	Low alloy steel	0.3D	1.5D	SFM(Vc)	470	470	470	470	470	470	470	470	470	470	470	470
					IPT(fz)	.0004	.0007	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	.0046
					RPM	14360	9570	7180	5740	4790	3590	3190	2870	2610	2390	1800	1440
					IPM(FEED)	29	33	47	43	48	45	43	43	43	42	36	33
	9		0.3D	1.5D	SFM(Vc)	330	330	330	330	330	330	330	330	330	330	330	330
					IPT(fz)	.0004	.0007	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	.0046
					RPM	10080	6720	5040	4030	3360	2520	2240	2020	1830	1680	1260	1010
					IPM(FEED)	20	24	33	30	34	32	30	30	30	29	25	23
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	470	470	470	470	470	470	470	470	470	470	470	470
					IPT(fz)	.0004	.0007	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	.0046
					RPM	14360	9570	7180	5740	4790	3590	3190	2870	2610	2390	1800	1440
					IPM(FEED)	29	33	47	43	48	45	43	43	43	42	36	33
	11.1		0.3D	1.5D	SFM(Vc)	330	330	330	330	330	330	330	330	330	330	330	330
					IPT(fz)	.0004	.0007	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040	.0046
					RPM	10080	6720	5040	4030	3360	2520	2240	2020	1830	1680	1260	1010
					IPM(FEED)	20	24	33	30	34	32	30	30	30	29	25	23
M	12-13	Stainless steel	0.3D	1.5D	SFM(Vc)	385	385	385	385	385	385	385	385	385	385	385	385
					IPT(fz)	.0003	.0004	.0009	.0010	.0012	.0018	.0020	.0021	.0022	.0024	.0028	.0033
					RPM	11760	7840	5880	4710	3920	2940	2610	2350	2140	1960	1470	1180
					IPM(FEED)	18	16	26	24	24	26	26	25	24	24	21	19
	14.1		0.3D	1.5D	SFM(Vc)	270	270	270	270	270	270	270	270	270	270	270	270
					IPT(fz)	.0004	.0005	.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035	.0041
					RPM	8250	5500	4130	3300	2750	2060	1830	1650	1500	1380	1030	830
					IPM(FEED)	17	14	25	21	21	26	24	22	21	21	18	17
	14.2		0.3D	1.5D	SFM(Vc)	195	195	195	195	195	195	195	195	195	195	195	195
					IPT(fz)	.0004	.0005	.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035	.0041
					RPM	5960	3970	2980	2380	1990	1490	1320	1190	1080	990	740	600
					IPM(FEED)	12	10	18	15	15	19	17	16	15	15	13	12
K	15-20	Grey cast iron	0.3D	1.5D	SFM(Vc)	350	350	350	350	350	350	350	350	350	350	350	350
					IPT(fz)	.0006	.0008	.0017	.0019	.0025	.0031	.0034	.0038	.0041	.0044	.0050	.0057
					RPM	10700	7130	5350	4280	3570	2670	2380	2140	1940	1780	1340	1070
					IPM(FEED)	32	29	45	41	45	41	40	41	40	39	34	30
S	31-35	Heat Resistant Super Alloys	0.1D	1.5D	SFM(Vc)	100	100	100	100	100	100	100	100	100	100	100	100
					IPT(fz)	.0004	.0005	.0008	.0009	.0011	.0017	.0018	.0019	.0019	.0021	.0024	.0027
					RPM	3060	2040	1530	1220	1020	760	680	610	560	510	380	310
					IPM(FEED)	5	4	5	4	4	5	5	5	4	4	4	3
	36-37	Titanium Alloys	0.2D	1.5D	SFM(Vc)	225	225	225	225	225	225	225	225	225	225	225	225
					IPT(fz)	.0004	.0004	.0011	.0011	.0013	.0022	.0023	.0024	.0025	.0027	.0031	.0036
					RPM	6880	4580	3440	2750	2290	1720	1530	1380	1250	1150	860	690
					IPM(FEED)	14	9	19	15	15	19	18	17	16	16	13	12



NOTES:
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TitaNox-POWER END MILLS

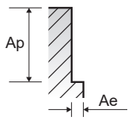
RECOMMENDED CUTTING CONDITIONS

EMI42, EMI43 SERIES TitaNox-Power HPC

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

5 FLUTE - Heavy Side Cutting

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-5	Non-alloy steel	0.5D	1.5D	SFM(Vc)	500	500	500	500	500	500	500	500
					IPT(fz)	.0013	.0016	.0018	.0022	.0031	.0037	.0043	.0049
					RPM	10190	7640	6110	5090	3820	3060	2550	1910
					IPM(FEED)	66	61	55	56	59	57	55	47
	6-8	Low alloy steel	0.5D	1.5D	SFM(Vc)	500	500	500	500	500	500	500	500
					IPT(fz)	.0013	.0016	.0018	.0022	.0031	.0037	.0043	.0049
					RPM	10190	7640	6110	5090	3820	3060	2550	1910
					IPM(FEED)	66	61	55	56	59	57	55	47
	9		0.5D	1.5D	SFM(Vc)	400	400	400	400	400	400	400	400
					IPT(fz)	.0008	.0012	.0014	.0017	.0024	.0028	.0033	.0038
					RPM	8150	6110	4890	4070	3060	2440	2040	1530
					IPM(FEED)	33	37	34	35	37	34	34	29
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	450	450	450	450	450	450	450	450
					IPT(fz)	.0013	.0016	.0018	.0022	.0031	.0037	.0043	.0049
					RPM	9170	6880	5500	4580	3440	2750	2290	1720
					IPM(FEED)	60	55	50	50	53	51	49	42
	11.1		0.5D	1.5D	SFM(Vc)	400	400	400	400	400	400	400	400
					IPT(fz)	.0008	.0012	.0014	.0017	.0024	.0028	.0033	.0038
					RPM	8150	6110	4890	4070	3060	2440	2040	1530
					IPM(FEED)	33	37	34	35	37	34	34	29
M	12-13	Stainless steel	0.5D	1.5D	SFM(Vc)	250	250	250	250	250	250	250	250
					IPT(fz)	.0007	.0010	.0012	.0015	.0021	.0024	.0028	.0032
					RPM	5090	3820	3060	2550	1910	1530	1270	950
					IPM(FEED)	18	19	18	19	20	18	18	15
	14.1		0.5D	1.5D	SFM(Vc)	300	300	300	300	300	300	300	300
					IPT(fz)	.0008	.0013	.0014	.0018	.0026	.0028	.0031	.0036
					RPM	6110	4580	3670	3060	2290	1830	1530	1150
					IPM(FEED)	24	30	26	28	30	26	24	21
	14.2		0.5D	1.5D	SFM(Vc)	200	200	200	200	200	200	200	200
					IPT(fz)	.0007	.0010	.0011	.0014	.0021	.0022	.0025	.0029
					RPM	4070	3060	2440	2040	1530	1220	1020	760
					IPM(FEED)	14	15	13	14	16	13	13	11
K	15-20	Grey cast iron	0.5D	1.5D	SFM(Vc)	370	370	370	370	370	370	370	370
					IPT(fz)	.0010	.0014	.0016	.0019	.0026	.0032	.0037	.0042
					RPM	7540	5650	4520	3770	2830	2260	1880	1410
					IPM(FEED)	38	40	36	36	37	36	35	30
S	31-35	Heat Resistant Super Alloys	0.2D	1.5D	SFM(Vc)	90	90	90	90	90	90	90	90
					IPT(fz)	.0006	.0010	.0012	.0014	.0019	.0021	.0023	.0027
					RPM	1830	1380	1100	920	690	550	460	340
					IPM(FEED)	5	7	7	6	7	6	5	5
	36-37	Titanium Alloys	0.5D	1.5D	SFM(Vc)	160	160	160	160	160	160	160	160
					IPT(fz)	.0006	.0010	.0012	.0014	.0019	.0021	.0023	.0027
					RPM	3260	2440	1960	1630	1220	980	810	610
					IPM(FEED)	10	12	12	11	12	10	9	8



NOTES:
- Maximum recommended depth shown
- Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
- Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD
- Reduce speed and feed recommendations for materials harder than listed
- Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

TitaNox-POWER END MILLS

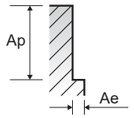
RECOMMENDED CUTTING CONDITIONS

EMI42, EMI43 SERIES — TitaNox-Power HPC

5 FLUTE - Side Cutting (Peel Milling)

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-5	Non-alloy steel	0.08D	2.0D	SFM(Vc)	650	650	650	650	650	650	650	650
					IPT(fz)	.0018	.0022	.0026	.0031	.0043	.0051	.0060	.0068
					RPM	13240	9930	7950	6620	4970	3970	3310	2480
					IPM(FEED)	119	109	103	103	107	101	99	84
	6-8	Low alloy steel	0.08D	2.0D	SFM(Vc)	650	650	650	650	650	650	650	650
					IPT(fz)	.0018	.0022	.0026	.0031	.0043	.0051	.0060	.0068
					RPM	13240	9930	7950	6620	4970	3970	3310	2480
					IPM(FEED)	119	109	103	103	107	101	99	84
	9		0.08D	2.0D	SFM(Vc)	650	650	650	650	650	650	650	650
					IPT(fz)	.0011	.0017	.0020	.0024	.0033	.0040	.0046	.0053
					RPM	13240	9930	7950	6620	4970	3970	3310	2480
					IPM(FEED)	73	84	80	79	82	79	76	66
	10	High alloyed steel, and tool steel	0.08D	2.0D	SFM(Vc)	580	580	580	580	580	580	580	580
					IPT(fz)	.0018	.0022	.0026	.0031	.0043	.0051	.0060	.0068
					RPM	11820	8860	7090	5910	4430	3540	2950	2220
					IPM(FEED)	106	97	92	92	95	90	89	75
	11.1		0.08D	2.0D	SFM(Vc)	550	550	550	550	550	550	550	550
					IPT(fz)	.0011	.0017	.0020	.0024	.0033	.0040	.0046	.0053
					RPM	11200	8400	6720	5600	4200	3360	2800	2100
					IPM(FEED)	62	71	67	67	69	67	64	56
M	12-13	Stainless steel	0.06D	2.0D	SFM(Vc)	350	350	350	350	350	350	350	350
					IPT(fz)	.0010	.0015	.0016	.0021	.0029	.0034	.0039	.0045
					RPM	7130	5350	4280	3570	2670	2140	1780	1340
					IPM(FEED)	36	40	34	37	39	36	35	30
	14.1		0.06D	2.0D	SFM(Vc)	425	425	425	425	425	425	425	425
					IPT(fz)	.0011	.0018	.0019	.0025	.0036	.0039	.0044	.0051
					RPM	8660	6490	5190	4330	3250	2600	2160	1620
					IPM(FEED)	48	58	49	54	59	51	48	41
	14.2		0.06D	2.0D	SFM(Vc)	300	300	300	300	300	300	300	300
					IPT(fz)	.0010	.0014	.0015	.0020	.0029	.0031	.0035	.0041
					RPM	6110	4580	3670	3060	2290	1830	1530	1150
					IPM(FEED)	31	32	28	31	33	28	27	24
K	15-20	Grey cast iron	0.07D	2.0D	SFM(Vc)	550	550	550	550	550	550	550	550
					IPT(fz)	.0014	.0020	.0022	.0027	.0037	.0045	.0052	.0059
					RPM	11200	8400	6720	5600	4200	3360	2800	2100
					IPM(FEED)	78	84	74	76	78	76	73	62
S	31-35	Heat Resistant Super Alloys	0.04D	2.0D	SFM(Vc)	120	120	120	120	120	120	120	120
					IPT(fz)	.0006	.0010	.0012	.0014	.0019	.0021	.0023	.0027
					RPM	2440	1830	1470	1220	920	730	610	460
					IPM(FEED)	7	9	9	9	9	8	7	6
	36-37	Titanium Alloys	0.05D	2.0D	SFM(Vc)	300	300	300	300	300	300	300	300
					IPT(fz)	.0006	.0010	.0012	.0014	.0019	.0021	.0023	.0027
					RPM	6110	4580	3670	3060	2290	1830	1530	1150
					IPM(FEED)	18	23	22	21	22	19	18	16



NOTES:
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TitaNox-POWER END MILLS

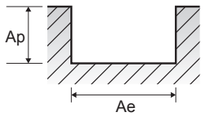
RECOMMENDED CUTTING CONDITIONS

EMI42, EMI43 SERIES — TitaNox-Power HPC

5 FLUTE - Slotting

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-5	Non-alloy steel	1.0D	1.0D	SFM(Vc)	275	275	275	275	275	275	275	275
					IPT(fz)	.0010	.0013	.0015	.0018	.0024	.0029	.0034	.0039
					RPM	5600	4200	3360	2800	2100	1680	1400	1050
					IPM(FEED)	28	27	25	25	25	24	24	20
	6-8	Low alloy steel	1.0D	1.0D	SFM(Vc)	275	275	275	275	275	275	275	275
					IPT(fz)	.0010	.0013	.0015	.0018	.0024	.0029	.0034	.0039
					RPM	5600	4200	3360	2800	2100	1680	1400	1050
					IPM(FEED)	28	27	25	25	25	24	24	20
	9		1.0D	1.0D	SFM(Vc)	275	275	275	275	275	275	275	275
					IPT(fz)	.0006	.0010	.0011	.0014	.0019	.0023	.0026	.0030
					RPM	5600	4200	3360	2800	2100	1680	1400	1050
					IPM(FEED)	17	21	18	20	20	19	18	16
	10	High alloyed steel, and tool steel	1.0D	0.75D	SFM(Vc)	230	230	230	230	230	230	230	230
					IPT(fz)	.0010	.0013	.0015	.0018	.0024	.0029	.0034	.0039
					RPM	4690	3510	2810	2340	1760	1410	1170	880
					IPM(FEED)	23	23	21	21	21	20	20	17
	11.1		1.0D	0.75D	SFM(Vc)	250	250	250	250	250	250	250	250
					IPT(fz)	.0006	.0010	.0011	.0014	.0019	.0023	.0026	.0030
					RPM	5090	3820	3060	2550	1910	1530	1270	950
					IPM(FEED)	15	19	17	18	18	18	17	14
M	12-13	Stainless steel	1.0D	0.5D	SFM(Vc)	225	225	225	225	225	225	225	225
					IPT(fz)	.0006	.0008	.0009	.0012	.0017	.0019	.0022	.0026
					RPM	4580	3440	2750	2290	1720	1380	1150	860
					IPM(FEED)	14	14	12	14	15	13	13	11
	14.1		1.0D	0.5D	SFM(Vc)	250	250	250	250	250	250	250	250
					IPT(fz)	.0006	.0010	.0011	.0014	.0021	.0023	.0025	.0029
					RPM	5090	3820	3060	2550	1910	1530	1270	950
					IPM(FEED)	15	19	17	18	20	18	16	14
	14.2		1.0D	0.5D	SFM(Vc)	200	200	200	200	200	200	200	200
					IPT(fz)	.0006	.0008	.0009	.0011	.0017	.0018	.0020	.0023
					RPM	4070	3060	2440	2040	1530	1220	1020	760
					IPM(FEED)	12	12	11	11	13	11	10	9
K	15-20	Grey cast iron	1.0D	1.0D	SFM(Vc)	260	260	260	260	260	260	260	260
					IPT(fz)	.0008	.0011	.0013	.0015	.0021	.0026	.0030	.0034
					RPM	5300	3970	3180	2650	1990	1590	1320	990
					IPM(FEED)	21	22	21	20	21	21	20	17
S	31-35	Heat Resistant Super Alloys	1.0D	0.4D	SFM(Vc)	64	64	64	64	64	64	64	64
					IPT(fz)	.0005	.0008	.0010	.0011	.0015	.0017	.0019	.0021
					RPM	1300	980	780	650	490	390	330	240
					IPM(FEED)	3	4	4	4	4	3	3	3
	36-37	Titanium Alloys	1.0D	0.5D	SFM(Vc)	160	160	160	160	160	160	160	160
					IPT(fz)	.0005	.0008	.0010	.0011	.0015	.0017	.0019	.0021
					RPM	3260	2440	1960	1630	1220	980	810	610
					IPM(FEED)	8	10	10	9	9	8	8	6



NOTES:
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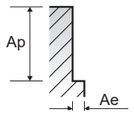
TitaNox-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

GMG40 SERIES — 4 FLUTE DOUBLE CORE - Side Cutting

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-5	Non-alloy steel	0.4D	1.0D	SFM(Vc)	525	525	525	525	525	525	525	525
					IPT(fz)	.0011	.0014	.0017	.0021	.0023	.0025	.0030	.0033
					RPM	8490	6370	5090	4240	3640	3180	2550	2040
					IPM(FEED)	37	36	35	36	33	32	31	27
	6-8	Low alloy steel	0.4D	1.0D	SFM(Vc)	490	490	490	490	490	490	490	490
					IPT(fz)	.0010	.0014	.0017	.0019	.0022	.0025	.0028	.0033
					RPM	7920	5940	4750	3960	3400	2970	2380	1900
					IPM(FEED)	32	33	32	30	30	30	27	25
	9		0.4D	1.0D	SFM(Vc)	525	525	525	525	525	525	525	525
					IPT(fz)	.0011	.0014	.0017	.0021	.0023	.0025	.0030	.0033
					RPM	8490	6370	5090	4240	3640	3180	2550	2040
					IPM(FEED)	37	36	35	36	33	32	31	27
	10	High alloyed steel, and tool steel	0.4D	1.0D	SFM(Vc)	490	490	490	490	490	490	490	490
					IPT(fz)	.0010	.0014	.0017	.0019	.0022	.0025	.0028	.0033
					RPM	7920	5940	4750	3960	3400	2970	2380	1900
					IPM(FEED)	32	33	32	30	30	30	27	25
	11.1		0.4D	1.0D	SFM(Vc)	490	490	490	490	490	490	490	490
					IPT(fz)	.0011	.0014	.0018	.0021	.0024	.0026	.0030	.0033
					RPM	7920	5940	4750	3960	3400	2970	2380	1900
					IPM(FEED)	35	33	34	33	33	31	29	25
M	12-13	Stainless steel	0.4D	1.0D	SFM(Vc)	510	510	510	510	510	510	510	510
					IPT(fz)	.0013	.0018	.0022	.0026	.0030	.0034	.0037	.0045
					RPM	8250	6190	4950	4120	3530	3090	2470	1980
					IPM(FEED)	43	45	44	43	42	42	37	36
	14.1		0.4D	1.0D	SFM(Vc)	345	345	345	345	345	345	345	345
					IPT(fz)	.0010	.0013	.0016	.0019	.0022	.0024	.0028	.0032
					RPM	5580	4180	3350	2790	2390	2090	1670	1340
					IPM(FEED)	22	22	21	21	21	20	19	17
	14.2		0.4D	0.6D	SFM(Vc)	145	145	145	145	145	145	145	145
					IPT(fz)	.0006	.0008	.0010	.0013	.0014	.0016	.0018	.0021
					RPM	2340	1760	1410	1170	1000	880	700	560
					IPM(FEED)	6	6	6	6	6	6	5	5
K	15-20	Grey cast iron	0.4D	1.0D	SFM(Vc)	575	575	575	575	575	575	575	575
					IPT(fz)	.0008	.0011	.0014	.0017	.0019	.0021	.0024	.0028
					RPM	9300	6970	5580	4650	3980	3490	2790	2230
					IPM(FEED)	30	31	31	32	30	29	27	25
S	31-35	Heat Resistant Super Alloys	0.3D	0.6D	SFM(Vc)	105	105	105	105	105	105	105	105
					IPT(fz)	.0008	.0010	.0013	.0015	.0017	.0019	.0022	.0026
					RPM	1700	1270	1020	850	730	640	510	410
					IPM(FEED)	5	5	5	5	5	5	4	4
	36-37	Titanium Alloys	0.3D	0.6D	SFM(Vc)	230	230	230	230	230	230	230	230
					IPT(fz)	.0013	.0019	.0022	.0026	.0030	.0034	.0037	.0045
					RPM	3720	2790	2230	1860	1590	1390	1120	890
					IPM(FEED)	19	21	20	19	19	19	17	16



NOTES:
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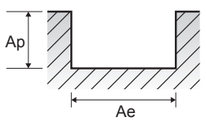
TitaNox-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

GMG40 SERIES — 4 FLUTE DOUBLE CORE - Slotting

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-5	Non-alloy steel	1.0D	1.0D	SFM(Vc)	410	410	410	410	410	410	410	410
					IPT(fz)	.0010	.0013	.0017	.0019	.0022	.0025	.0028	.0033
					RPM	6630	4970	3980	3310	2840	2490	1990	1590
					IPM(FEED)	27	26	27	25	25	25	22	21
	6-8	Low alloy steel	1.0D	1.0D	SFM(Vc)	395	395	395	395	395	395	395	395
					IPT(fz)	.0010	.0013	.0017	.0019	.0022	.0025	.0028	.0030
					RPM	6390	4790	3830	3190	2740	2400	1920	1530
					IPM(FEED)	26	25	26	24	24	24	22	18
	9		1.0D	1.0D	SFM(Vc)	410	410	410	410	410	410	410	410
					IPT(fz)	.0010	.0013	.0017	.0019	.0022	.0025	.0028	.0033
					RPM	6630	4970	3980	3310	2840	2490	1990	1590
					IPM(FEED)	27	26	27	25	25	25	22	21
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	395	395	395	395	395	395	395	395
					IPT(fz)	.0010	.0013	.0017	.0019	.0022	.0025	.0028	.0030
					RPM	6390	4790	3830	3190	2740	2400	1920	1530
					IPM(FEED)	26	25	26	24	24	24	22	18
	11.1		1.0D	1.0D	SFM(Vc)	395	395	395	395	395	395	395	395
					IPT(fz)	.0011	.0014	.0017	.0021	.0023	.0025	.0030	.0033
					RPM	6390	4790	3830	3190	2740	2400	1920	1530
					IPM(FEED)	28	27	26	27	25	24	23	20
M	12-13	Stainless steel	1.0D	1.0D	SFM(Vc)	410	410	410	410	410	410	410	410
					IPT(fz)	.0013	.0018	.0022	.0026	.0029	.0032	.0037	.0041
					RPM	6630	4970	3980	3310	2840	2490	1990	1590
					IPM(FEED)	34	36	35	34	33	32	29	26
	14.1		1.0D	1.0D	SFM(Vc)	280	280	280	280	280	280	280	280
					IPT(fz)	.0010	.0013	.0016	.0019	.0022	.0024	.0028	.0032
					RPM	4530	3400	2720	2260	1940	1700	1360	1090
					IPM(FEED)	18	18	17	17	17	16	15	14
	14.2		1.0D	0.5D	SFM(Vc)	120	120	120	120	120	120	120	120
					IPT(fz)	.0006	.0008	.0010	.0013	.0014	.0016	.0018	.0021
					RPM	1940	1460	1160	970	830	730	580	470
					IPM(FEED)	5	5	5	5	5	5	4	4
K	15-20	Grey cast iron	1.0D	1.0D	SFM(Vc)	460	460	460	460	460	460	460	460
					IPT(fz)	.0008	.0011	.0014	.0017	.0019	.0021	.0024	.0026
					RPM	7440	5580	4460	3720	3190	2790	2230	1790
					IPM(FEED)	24	25	25	25	24	23	21	19
S	31-35	Heat Resistant Super Alloys	1.0D	0.4D	SFM(Vc)	80	80	80	80	80	80	80	80
					IPT(fz)	.0007	.0009	.0012	.0014	.0016	.0017	.0020	.0022
					RPM	1290	970	780	650	550	490	390	310
					IPM(FEED)	4	3	4	4	4	3	3	3
	36-37	Titanium Alloys	1.0D	1.0D	SFM(Vc)	180	180	180	180	180	180	180	180
					IPT(fz)	.0013	.0018	.0022	.0026	.0030	.0034	.0037	.0041
					RPM	2910	2180	1750	1460	1250	1090	870	700
					IPM(FEED)	15	16	15	15	15	15	13	11



NOTES:
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TitaNox-POWER END MILLS

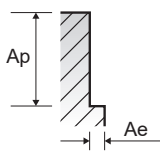
RECOMMENDED CUTTING CONDITIONS

GMG24, GMG26, GMG28, GMG30 SERIES

5 FLUTE - Side Cutting

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)								
						6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-5	Non-alloy steel	0.3D	1.5D	SFM(Vc)	475	475	475	475	475	475	475	475	475
					IPT(fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040
					RPM	7680	5760	4610	3840	3290	2880	2560	2300	1840
					IPM(FEED)	50	43	46	48	44	43	42	40	37
	6-8	Low alloy steel	0.3D	1.5D	SFM(Vc)	330	330	330	330	330	330	330	330	330
					IPT(fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040
					RPM	5340	4000	3200	2670	2290	2000	1780	1600	1280
					IPM(FEED)	35	30	32	33	31	30	29	28	26
	9		0.3D	1.5D	SFM(Vc)	475	475	475	475	475	475	475	475	475
					IPT(fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040
					RPM	7680	5760	4610	3840	3290	2880	2560	2300	1840
					IPM(FEED)	50	43	46	48	44	43	42	40	37
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	330	330	330	330	330	330	330	330	330
					IPT(fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0033	.0035	.0040
					RPM	5340	4000	3200	2670	2290	2000	1780	1600	1280
					IPM(FEED)	35	30	32	33	31	30	29	28	26
	11.1		0.3D	1.5D	SFM(Vc)	200	200	200	200	200	200	200	200	200
					IPT(fz)	.0009	.0011	.0014	.0017	.0019	.0021	.0023	.0024	.0028
					RPM	3230	2430	1940	1620	1390	1210	1080	970	780
					IPM(FEED)	15	13	14	14	13	13	12	12	11
M	12-13	Stainless steel	0.3D	1.5D	SFM(Vc)	385	385	385	385	385	385	385	385	385
					IPT(fz)	.0009	.0010	.0012	.0018	.0020	.0021	.0022	.0024	.0028
					RPM	6230	4670	3740	3110	2670	2330	2080	1870	1490
					IPM(FEED)	28	23	22	28	27	24	23	22	21
	14.1		0.3D	1.5D	SFM(Vc)	270	270	270	270	270	270	270	270	270
					IPT(fz)	.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035
					RPM	4370	3270	2620	2180	1870	1640	1460	1310	1050
					IPM(FEED)	26	21	20	27	24	22	20	20	18
	14.2		0.3D	1.5D	SFM(Vc)	195	195	195	195	195	195	195	195	195
					IPT(fz)	.0012	.0013	.0015	.0025	.0026	.0027	.0028	.0030	.0035
					RPM	3150	2360	1890	1580	1350	1180	1050	950	760
					IPM(FEED)	19	15	14	20	18	16	15	14	13
K	15-20	Grey cast iron	0.3D	1.5D	SFM(Vc)	350	350	350	350	350	350	350	350	350
					IPT(fz)	.0017	.0019	.0025	.0031	.0034	.0038	.0041	.0044	.0050
					RPM	5660	4240	3400	2830	2430	2120	1890	1700	1360
					IPM(FEED)	48	40	43	44	41	40	39	37	34
S	31-35	Heat Resistant Super Alloys	0.1D	1.5D	SFM(Vc)	100	100	100	100	100	100	100	100	100
					IPT(fz)	.0008	.0009	.0011	.0017	.0018	.0019	.0019	.0021	.0024
					RPM	1620	1210	970	810	690	610	540	490	390
					IPM(FEED)	6	5	5	7	6	6	5	5	5
	36-37	Titanium Alloys	0.3D	1.5D	SFM(Vc)	225	225	225	225	225	225	225	225	225
					IPT(fz)	.0011	.0011	.0013	.0022	.0023	.0024	.0025	.0027	.0031
					RPM	3640	2730	2180	1820	1560	1360	1210	1090	870
					IPM(FEED)	20	15	14	20	18	16	15	15	13



NOTES:
- Maximum recommended depth shown
- Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
- Feed to be reduced by approximately 50% if L.O.C.(length of cut) is over 3xD
- Reduce speed and feed recommendations for materials harder than listed
- Recommendations above are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

YG

Leading Through Innovation

SOLID CARBIDE

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- For Exotic materials like Stainless Steels, Nickel Alloys and Titanium

SELECTION GUIDE

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Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C579

							Inch			
						SERIES	EH108	EE882	E5075 E5105	E5074 E5104
						FLUTE	3&4	6	3	3
						HELIX ANGLE	50°	35°	35°	35°
						CUTTING EDGE SHAPE	SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS
						SIZE MIN	D1/8	D3/4	D1/8	D1/8
						SIZE MAX	D1	D1-1/2	D1	D1
						PAGE	C564	C565	C566	C567
							REGULAR LENGTH	REGULAR LENGTH	STUB LENGTH HOSS	REGULAR LENGTH HOSS
							TiAlN	TiAlN	Uncoated TiN TiCN TYLON F TYLON E	Uncoated TiN TiCN TYLON F TYLON E
							U.S.A Stock	Call for Availability	U.S.A Stock	
								HSS-PM		
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	○	○	○
	2		About 0.45% C	Annealed	190	13	○	○	○	○
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	○	○
	6	Low alloy steel		Annealed	180	10	○	○	○	○
	7			Quenched & Tempered	275	29	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	○	○
	9			Quenched & Tempered	350	38	◎	◎	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	○	○	○	○
	11			Quenched & Tempered	325	35	◎	◎	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10			○	○
	16		Pearlitic (Martensitic)		260	26			○	○
	17	Nodular cast iron	Ferritic		160	3			○	○
	18		Pearlitic		250	25			○	○
	19	Malleable cast iron	Ferritic		130				○	○
	20		Pearlitic		230	21			○	○
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead-free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○		
	32			Cured	280	30	○	○		
	33		Ni or Co Based	Annealed	250	25	○	○		
	34			Cured	350	38	○	○		
	35			Cast	320	34	○	○		
	36	Titanium Alloys	Pure Titanium		400 Rm		◎	◎		
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎	◎		
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42	○	○		
	41	Hardened Cast Iron		Hardened	550	55				

							Inch				Metric						
						SERIES	EH094	EH095	EH969	EH970	EH830	EE515	EH852	EH831	EH917	EH919	EH921
						FLUTE	3~5	3~5	3~6	4~6	3&4	4&6	3~5	3~5	4~6	3~6	4~6
						HELIX ANGLE	30°	30°	45°	45°	50°	30°	30°	30°	45°	45°	45°
						CUTTING EDGE SHAPE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	SQUARE	SQUARE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING
						SIZE MIN	D1/4	D1/4	D3/16	D1/4	D6.0	D3.0	D6.0	D6.0	D6.0	D4.0	D6.0
						SIZE MAX	D1	D1	D1	D3/4	D25.0	D25.0	D25.0	D25.0	D20.0	D25.0	D20.0
						PAGE	C568	C569	C570	C571	C572	C573	C574	C575	C576	C577	C578
							STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH	LONG LENGTH FINE PITCH	LONG REACH FINE PITCH	LONG LENGTH	SHORT LENGTH	STUB LENGTH FINE PITCH	LONG LENGTH FINE PITCH	FINE PITCH	LONG LENGTH FINE PITCH	LONG REACH FINE PITCH
							TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN
							U.S.A Stock				Call for Availability						
												HSS-PM					
P	1						○	○	○	○	○	○	○	○	○	○	○
	2						○	○	○	○	○	○	○	○	○	○	○
	3						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	4						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	5						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	6						○	○	○	○	○	○	○	○	○	○	○
	7						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	8						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	9						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	10						○	○	○	○	○	○	○	○	○	○	○
	11						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
M	12						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	13						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	14						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
K	15																
	16																
	17																
	18																
	19																
	20																
N	21																
	22																
	23																
	24																
	25																
	26																
	27																
	28																
	29																
	30																
S	31						○	○	○	○	○	○	○	○	○	○	○
	32						○	○	○	○	○	○	○	○	○	○	○
	33						○	○	○	○	○	○	○	○	○	○	○
	34						○	○	○	○	○	○	○	○	○	○	○
	35						○	○	○	○	○	○	○	○	○	○	○
	36						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	37						◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
H	38																
	39																
	40						○	○	○	○	○	○	○	○	○	○	○
	41																

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V7 MILL INOX
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TECHNICAL DATA

JET-POWER END MILLS

PLAIN SHANK
FLAT SHANK
EH108 SERIES

CARBIDE, 3&4 FLUTE 50° HELIX REGULAR LENGTH

- Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, inconel, nimonic, etc.
- Corner Protection against chipping.

CARBIDE | 3&4 | 50° | PLAIN | FLAT | TiAlN

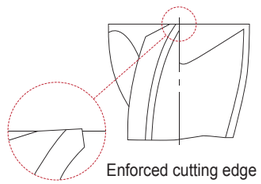
p.C579

◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
95063	-	**1/8**	1/8	1/2	1-1/2	3
95064	-	**3/16**	3/16	5/8	2	3
95065	-	**1/4**	1/4	3/4	2-1/2	3
95066	-	**5/16**	5/16	13/16	2-1/2	3
-	**95067**	**3/8**	3/8	1	2-1/2	3
95115	-	**7/16**	7/16	1	2-3/4	3
-	**95068**	**1/2**	1/2	1	3	3
-	**95069**	**5/8**	5/8	1-1/4	3-1/2	3
-	**95070**	**3/4**	3/4	1-1/2	4	4
-	**95071**	**1**	1	1-1/2	4	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

FLAT SHANK
EE882 SERIES

HSS-PM, 6 FLUTE 35° HELIX REGULAR LENGTH

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- High velocity milling operation and good surface finishes.

HSS PM | 6 | 35° | FLAT | TiAlN

p.C581

◇ Call for availability

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
95094	**3/4**	3/4	1-5/8	3-7/8
95095	**7/8**	7/8	1-7/8	4-1/8
95096	**1**	1	2	4-1/2
95097	**1-1/4**	1-1/4	2	4-1/2
95098	**1-1/2**	1-1/4	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~+.0010	0~-.0003

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK Ø1/8~Ø5/16 **E5075** SERIES
FLAT SHANK Ø11/32~Ø1 **E5105** SERIES

CARBIDE, 3 FLUTE 35° HELIX STUB LENGTH CORNER RADIUS - "HOSS"

- ▶ #1 Choice for slotting, ramping & pocket work on stainless, monel & other alloys up to HRc35.
- ▶ Dry milling is recommended on steel alloys to reduce thermal shock and increase the life (YG:TYLON F or E COATING).

CARBIDE | 3 | 35° | PLAIN | FLAT | Ø1/8~Ø5/16 Ø11/32~Ø1 p.C582

◆ U.S.A Stock

Unit : Inch

EDP No.					Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R				
57558	**57558TN**	**57558TC**	**57558TF**	**57558TE**	.008~.010	**1/8**	1/8	1/4	1-1/2
57561	**57561TN**	**57561TC**	**57561TF**	**57561TE**	.008~.010	**5/32**	3/16	5/16	2
57565	**57565TN**	**57565TC**	**57565TF**	**57565TE**	.008~.010	**3/16**	3/16	5/16	2
57570	**57570TN**	**57570TC**	**57570TF**	**57570TE**	.015~.020	**7/32**	1/4	3/8	2
57573	**57573TN**	**57573TC**	**57573TF**	**57573TE**	.015~.020	**1/4**	1/4	3/8	2
57576	**57576TN**	**57576TC**	**57576TF**	**57576TE**	.015~.020	**9/32**	5/16	7/16	2
57579	**57579TN**	**57579TC**	**57579TF**	**57579TE**	.015~.020	**5/16**	5/16	7/16	2
57582	**57582TN**	**57582TC**	**57582TF**	**57582TE**	.015~.020	**11/32**	3/8	1/2	2
57584	**57584TN**	**57584TC**	**57584TF**	**57584TE**	.015~.020	**3/8**	3/8	1/2	2
57588	**57588TN**	**57588TC**	**57588TF**	**57588TE**	.015~.020	**7/16**	7/16	9/16	2-1/2
57593	**57593TN**	**57593TC**	**57593TF**	**57593TE**	.030~.035	**1/2**	1/2	5/8	2-1/2
57595	**57595TN**	**57595TC**	**57595TF**	**57595TE**	.030~.035	**5/8**	5/8	3/4	3
57598	**57598TN**	**57598TC**	**57598TF**	**57598TE**	.030~.035	**3/4**	3/4	1	3
57600	**57600TN**	**57600TC**	**57600TF**	**57600TE**	.030~.035	**1**	1	1-1/4	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	○	○	◎	○	○	○	○		◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

JET-POWER END MILLS

PLAIN SHANK Ø1/8~Ø5/16 **E5074** SERIES
FLAT SHANK Ø11/32~Ø1 **E5104** SERIES

CARBIDE, 3 FLUTE 35° HELIX REGULAR LENGTH CORNER RADIUS - "HOSS"

- ▶ #1 Choice for slotting, ramping & pocket work on stainless, monel & other alloys up to HRc35.
- ▶ Dry milling is recommended on steel alloys to reduce thermal shock and increase the life (YG:TYLON F or E COATING).

CARBIDE | 3 | 35° | PLAIN | FLAT | Ø1/8~Ø5/16 Ø11/32~Ø1 p.C582

◆ U.S.A Stock

Unit : Inch

EDP No.					Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R				
56558	**56558TN**	**56558TC**	**56558TF**	**56558TE**	.008~.010	**1/8**	1/8	1/2	1-1/2
56561	**56561TN**	**56561TC**	**56561TF**	**56561TE**	.008~.010	**5/32**	3/16	9/16	2
56565	**56565TN**	**56565TC**	**56565TF**	**56565TE**	.008~.010	**3/16**	3/16	9/16	2
56570	**56570TN**	**56570TC**	**56570TF**	**56570TE**	.015~.020	**7/32**	1/4	3/4	2-1/2
56573	**56573TN**	**56573TC**	**56573TF**	**56573TE**	.015~.020	**1/4**	1/4	3/4	2-1/2
56576	**56576TN**	**56576TC**	**56576TF**	**56576TE**	.015~.020	**9/32**	5/16	13/16	2-1/2
56579	**56579TN**	**56579TC**	**56579TF**	**56579TE**	.015~.020	**5/16**	5/16	13/16	2-1/2
56582	**56582TN**	**56582TC**	**56582TF**	**56582TE**	.015~.020	**11/32**	3/8	1	2-1/2
56584	**56584TN**	**56584TC**	**56584TF**	**56584TE**	.015~.020	**3/8**	3/8	1	2-1/2
56588	**56588TN**	**56588TC**	**56588TF**	**56588TE**	.015~.020	**7/16**	7/16	1	2-3/4
56593	**56593TN**	**56593TC**	**56593TF**	**56593TE**	.030~.035	**1/2**	1/2	1-1/4	3
56595	**56595TN**	**56595TC**	**56595TF**	**56595TE**	.030~.035	**5/8**	5/8	1-5/8	3-1/2
56598	**56598TN**	**56598TC**	**56598TF**	**56598TE**	.030~.035	**3/4**	3/4	1-5/8	4
56600	**56600TN**	**56600TC**	**56600TF**	**56600TE**	.030~.035	**1**	1	2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	○	○	◎	○	○	○	○		◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																					

JET-POWER END MILLS

PLAIN SHANK **EH094** SERIES

CARBIDE, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- High velocity milling operation.
- Fast chip ejection.

CARBIDE | FINE | 3-5 | 30° | PLAIN | TiAlN

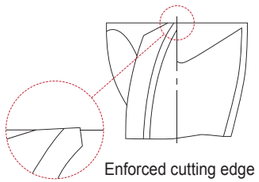
p.C584

◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
95072	1/4	1/4	5/16	2-1/8	3
95073	5/16	5/16	3/8	2-1/4	3
95074	3/8	3/8	9/16	2-1/2	3
95075	1/2	1/2	5/8	3	4
95076	5/8	5/8	7/8	3-1/4	4
95077	3/4	3/4	1	3-3/4	4
95078	1	1	1	4	5

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
1/4~3/8	0 ~ -.0022	0~-.0003
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH095** SERIES

CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

- Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- High velocity milling operation.
- Fast chip ejection.

CARBIDE | FINE | 3-5 | 30° | PLAIN | TiAlN

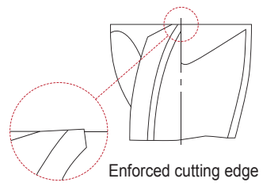
p.C584

◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
95079	1/4	1/4	3/4	2-1/2	3
95080	5/16	5/16	3/4	2-1/2	3
95081	3/8	3/8	7/8	2-1/2	3
95082	1/2	1/2	1	3	4
95083	5/8	5/8	1-1/4	3-1/2	4
95084	3/4	3/4	1-5/8	4	4
95085	1	1	1-3/4	4	5

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
1/4~3/8	0 ~ -.0022	0~-.0003
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH969** SERIES

CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING

- Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- High chip removed and minimizing breakages of cutting edges.
- Corner Protection against chipping.

CARBIDE | FINE | 3-6 | 45° | PLAIN | TiAlN

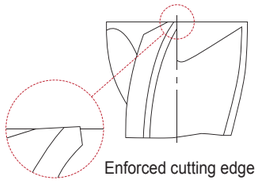
p.C584

◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
95107	3/16	1/4	1/2	2-1/4	3
95108	1/4	1/4	3/4	2-1/2	4
95109	5/16	5/16	3/4	2-1/2	4
95110	3/8	3/8	7/8	2-1/2	4
95111	1/2	1/2	1	3	4
95112	5/8	5/8	1-1/4	3-1/2	5
95113	3/4	3/4	1-5/8	4	6
95114	1	1	1-3/4	4	6

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
3/16	0 ~ -.0019	0~-.0003
1/4~3/8	0 ~ -.0022	
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	



◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			M			K				
													Stainless steel			Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

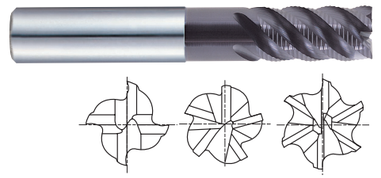
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

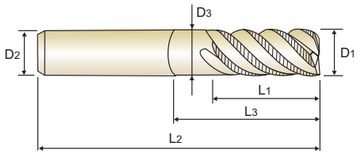
JET-POWER END MILLS

PLAIN SHANK **EH970** SERIES

CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING

- Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- High chip removed and minimizing breakages of cutting edges.
- Corner Protection against chipping.





CARBIDE | FINE | 4-6 | 45° | PLAIN | TiAlN

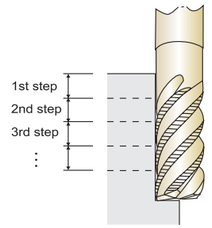
p.C584

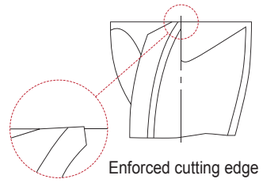
◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	No. of Flute
	D1	D2	L1	L3	L2	D3	
95101	1/4	1/4	3/4	7/8	2-1/2	.230	4
95102	5/16	5/16	3/4	1	2-1/2	.292	4
95103	3/8	3/8	7/8	1-1/4	2-1/2	.355	4
95104	1/2	1/2	1	1-1/2	3	.480	4
95105	5/8	5/8	1-1/4	2	4	.605	5
95106	3/4	3/4	1-5/8	2-3/8	4-3/8	.719	6

Mill Dia. (inch)	Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
1/4~3/8	0 ~ -.0022	0~-.0003
1/2~5/8	0 ~ -.0027	
3/4~1	0 ~ -.0033	





◎ : Excellent ○ : Good

ISO	P												M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH830** SERIES

CARBIDE, 3&4 FLUTE 50° HELIX LONG LENGTH

- Reduces chipping of corner edges
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc

CARBIDE | 3&4 | 50° | PLAIN | TiAlN

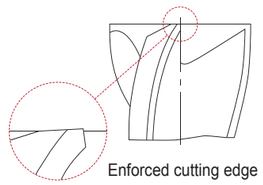
p.C586

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	No. of Flute
	Metric	Inch				
EH830060	6.0	.2362	6	13	50	3
EH830901	6.0	.2362	6	13	50	4
EH830080	8.0	.3150	8	19	60	3
EH830100	10.0	.3937	10	22	70	3
EH830120	12.0	.4724	12	25	75	3
EH830160	16.0	.6299	16	32	90	3
EH830180	18.0	.7087	18	32	90	3
EH830200	20.0	.7874	20	38	100	4
EH830250	25.0	.9843	25	45	120	4

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P																				K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron						
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20						
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21						
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230						
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎												

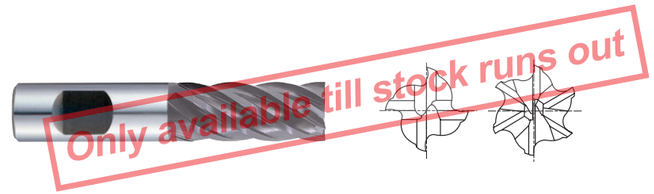
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

FLAT SHANK **EE515** SERIES

HSS-PM, 4&6 FLUTE SHORT LENGTH

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- High velocity milling operation and good surface finishes.



HSS PM | 4&6 | 30° | FLAT | TiAlN

p.C588

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length	No. of Flute
	Metric	Inch				
EE515030	3.0	.1181	6	8	52	4
EE515040	4.0	.1575	6	11	55	4
EE515050	5.0	.1969	6	13	57	4
EE515060	6.0	.2362	6	13	57	4
EE515080	8.0	.3150	10	19	69	4
EE515100	10.0	.3937	10	22	72	4
EE515120	12.0	.4724	12	26	83	4
EE515140	14.0	.5512	12	26	83	4
EE515160	16.0	.6299	16	32	92	6
EE515180	18.0	.7087	16	32	92	6
EE515200	20.0	.7874	20	38	104	6
EE515250	25.0	.9843	25	45	121	6

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~+0.03	h6

◎ : Excellent ○ : Good

ISO	P																				K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron						
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20						
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21						
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230						
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎												

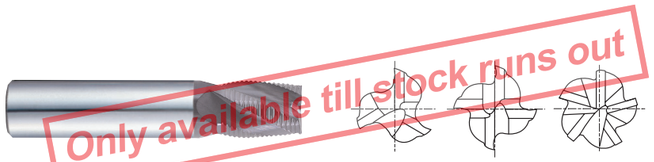
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH852** SERIES

CARBIDE, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- High velocity milling operation.
- Fast chip ejection.



CARBIDE | FINE | 3-5 | 30° | PLAIN | TiAlN

p.C589

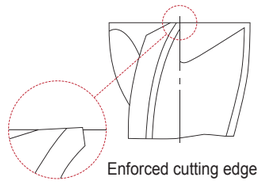
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter Metric h10	Mill Diameter Inch h10	Shank Diameter h6	Length of Cut	Overall Length	No. of Flute
EH852060	6.0	.2362	6	7	54	3
EH852070	7.0	.2756	8	8	58	3
EH852080	8.0	.3150	8	9	58	3
EH852090	9.0	.3543	10	13	66	4
EH852100	10.0	.3937	10	14	66	4
EH852120	12.0	.4724	12	16	73	4
EH852140	14.0	.5512	14	18	75	4
EH852160	16.0	.6299	16	22	82	4
EH852180	18.0	.7087	18	24	84	4
EH852200	20.0	.7874	20	26	92	4
EH852250	25.0	.9843	25	25	110	5

Tolerances according to DIN 7160 & 7161

Tolerance range in µm, Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / - 40	0 / - 48	0 / - 58	0 / - 70	0 / - 84
h6	0 / - 6	0 / - 8	0 / - 9	0 / - 11	0 / - 13



◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

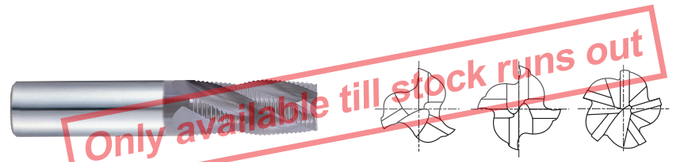
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH831** SERIES

CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- High velocity milling operation.
- Fast chip ejection.



CARBIDE | FINE | 3-5 | 30° | PLAIN | TiAlN

p.C589

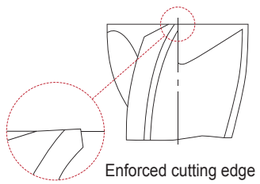
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter Metric h10	Mill Diameter Inch h10	Shank Diameter h6	Length of Cut	Overall Length	No. of Flute
EH831060	6.0	.2362	6	16	57	3
EH831070	7.0	.2756	8	16	63	3
EH831080	8.0	.3150	8	16	63	3
EH831090	9.0	.3543	10	19	72	4
EH831100	10.0	.3937	10	22	72	4
EH831120	12.0	.4724	12	26	83	4
EH831140	14.0	.5512	14	26	83	4
EH831160	16.0	.6299	16	32	92	4
EH831180	18.0	.7087	18	32	92	4
EH831200	20.0	.7874	20	38	104	4
EH831250	25.0	.9843	25	45	121	5

Tolerances according to DIN 7160 & 7161

Tolerance range in µm, Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / - 40	0 / - 48	0 / - 58	0 / - 70	0 / - 84
h6	0 / - 6	0 / - 8	0 / - 9	0 / - 11	0 / - 13



◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH917** SERIES

CARBIDE, MULTI FLUTE 45° HELIX FINE PITCH ROUGHING

- High chip removal and minimizing breakages of cutting edges.
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc

CARBIDE | FINE | 4-6 | 45° | PLAIN | TiAlN p.C591

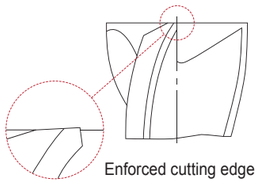
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter Metric h10	Mill Diameter Inch h10	Shank Diameter h6	Length of Cut	Overall Length	No. of Flute
EH917060	6.0	.2362	6	7	54	4
EH917080	8.0	.3150	8	9	58	4
EH917100	10.0	.3937	10	14	66	4
EH917120	12.0	.4724	12	16	73	4
EH917160	16.0	.6299	16	22	82	5
EH917200	20.0	.7874	20	26	92	6

Tolerances according to DIN 7160 & 7161

Tolerance range in µm, Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / -40	0 / -48	0 / -58	0 / -70	0 / -84
h6	0 / -6	0 / -8	0 / -9	0 / -11	0 / -13



◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH919** SERIES

CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING

- High chip removal and minimizing breakages of cutting edges.
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc

CARBIDE | FINE | 3-6 | 45° | PLAIN | TiAlN p.C593

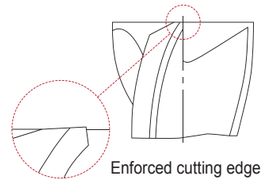
◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter Metric h10	Mill Diameter Inch h10	Shank Diameter h6	Length of Cut	Overall Length	No. of Flute
EH919040	4.0	.1575	6	11	57	3
EH919050	5.0	.1969	6	13	57	4
EH919060	6.0	.2362	6	16	57	4
EH919070	7.0	.2756	8	16	63	4
EH919080	8.0	.3150	8	16	63	4
EH919090	9.0	.3543	10	19	72	4
EH919100	10.0	.3937	10	22	72	4
EH919120	12.0	.4724	12	26	83	4
EH919140	14.0	.5512	14	26	83	5
EH919160	16.0	.6299	16	32	92	5
EH919200	20.0	.7874	20	38	104	6
EH919250	25.0	.9843	25	45	121	6

Tolerances according to DIN 7160 & 7161

Tolerance range in µm, Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / -40	0 / -48	0 / -58	0 / -70	0 / -84
h6	0 / -6	0 / -8	0 / -9	0 / -11	0 / -13



◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎						

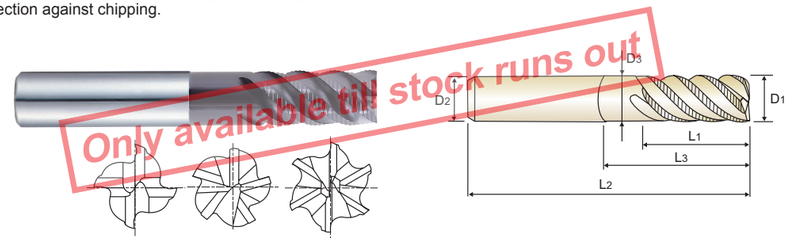
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

JET-POWER END MILLS

PLAIN SHANK **EH921** SERIES

CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING

- ▶Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- ▶High chip removed and minimizing breakages of cutting edges.
- ▶Corner Protection against chipping.



Only available till stock runs out

CARBIDE | FINE | 4-6 | 45° | PLAIN | TiAlN

p.C591

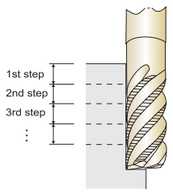
◇ Call for Availability

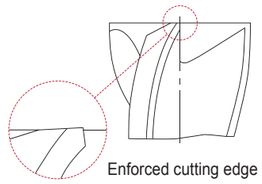
Unit : mm

EDP No.	Mill Diameter Metric D1	Mill Diameter Inch D1	Shank Diameter D2	Length of Cut L1	Length Below Shank L3	Overall Length L2	Neck Diameter D3	No. of Flute
EH921060	6.0	.2362	6	16	20	57	5.5	4
EH921080	8.0	.3150	8	16	26	63	7.5	4
EH921100	10.0	.3937	10	22	31	72	9.5	4
EH921120	12.0	.4724	12	26	37	83	11.5	4
EH921160	16.0	.6299	16	32	51	100	15.5	5
EH921200	20.0	.7874	20	38	59	110	19.2	6

Tolerances according to DIN 7160 & 7161

	Tolerance range in µm, Nominal-Diameter in mm				
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13





◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230	
Recommended	○	○	◎	◎	◎	○	◎	◎	◎	○	◎	○	◎	◎	◎							

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎			○	

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

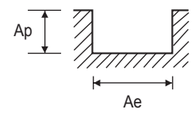
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

EH108 SERIES 3&4 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0010	.0008
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(FEED)	12	13	12	10	8	7	5
	5		1.0D	0.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	8	7	6	5	4	3	2
	6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0010	.0008
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(FEED)	12	13	12	10	8	7	5
	8-9		1.0D	0.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	8	7	6	5	4	3	2
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0010	.0008
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(FEED)	12	13	12	10	8	7	5
	11.1-11.2		1.0D	0.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	8	7	6	5	4	3	2
M	12-14.2	Stainless steel	1.0D	0.05D	SFM(Vc)	185	170	165	180	170	175	175
					IPT(fz)	.0007	.0010	.0011	.0011	.0013	.0010	.0009
					RPM	2840	2100	1680	1370	1050	880	670
					IPM(FEED)	6	6	6	5	4	3	2
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	75	70	65	75	70	70	70
					IPT(fz)	.0005	.0006	.0008	.0007	.0008	.0009	.0006
					RPM	1160	840	670	560	420	350	270
					IPM(FEED)	2	2	2	1	1	1	1
	36-37	Titanium Alloys	1.0D	0.05D	SFM(Vc)	100	90	85	95	90	95	90
					IPT(fz)	.0005	.0007	.0008	.0008	.0008	.0006	.0006
					RPM	1500	1090	870	730	550	480	350
					IPM(FEED)	2	2	2	2	1	1	1
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0008	.0007
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	8	7	6	5	4	3	2



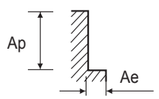
※ The Feed, in long & extra long types, should be reduced by around 50%.

JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EH108 SERIES — 3&4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(FEED)	16	17	15	12	10	9	6
	5		0.5D	1.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	10	9	7	6	5	4	3
	6-7	Low alloy steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(FEED)	16	17	15	12	10	9	6
	8-9		0.5D	1.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	10	9	7	6	5	4	3
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	365	345	320	360	360	345	355
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0012	.0011
					RPM	5560	4200	3260	2740	2200	1750	1360
					IPM(FEED)	16	17	15	12	10	9	6
	11.1-11.2		0.5D	1.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	10	9	7	6	5	4	3
M	12-14.2	Stainless steel	0.5D	1.5D	SFM(Vc)	185	170	165	180	170	175	175
					IPT(fz)	.0010	.0014	.0017	.0017	.0017	.0015	.0017
					RPM	2840	2100	1680	1370	1050	880	670
					IPM(FEED)	8	9	9	7	5	5	5
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	70	70	65	75	70	70	70
					IPT(fz)	.0007	.0008	.0010	.0011	.0011	.0009	.0009
					RPM	1050	840	680	560	420	350	270
					IPM(FEED)	2	2	2	2	1	1	1
	36-37	Titanium Alloys	0.05D	1.0D	SFM(Vc)	90	90	85	95	90	95	90
					IPT(fz)	.0007	.0009	.0011	.0012	.0012	.0008	.0010
					RPM	1360	1090	880	730	550	480	350
					IPM(FEED)	3	3	3	3	2	2	1
H	40	Chilled Cast Iron	0.5D	1.5D	SFM(Vc)	220	205	195	220	225	215	220
					IPT(fz)	.0010	.0012	.0012	.0012	.0012	.0010	.0009
					RPM	3360	2520	2000	1680	1360	1100	840
					IPM(FEED)	10	9	7	6	5	4	3

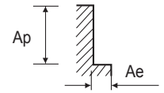


JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EE882 SERIES — 6 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/4	7/8	1	1-1/4	1-1/2
P	1-4	Non-alloy steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170
					IPT(fz)	.0014	.0017	.0017	.0017	.0017
					RPM	960	730	640	520	430
					IPM(FEED)	8	7	7	5	4
	5		0.1D	1.5D	SFM(Vc)	40	40	45	45	40
					IPT(fz)	.0006	.0006	.0006	.0006	.0006
					RPM	215	180	165	130	105
					IPM(FEED)	1	1	1	1	1
	6-7	Low alloy steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170
					IPT(fz)	.0014	.0017	.0017	.0017	.0017
					RPM	960	730	640	520	430
					IPM(FEED)	8	7	7	5	4
	8-9		0.1D	1.5D	SFM(Vc)	40	40	45	45	40
					IPT(fz)	.0006	.0006	.0006	.0006	.0006
					RPM	215	180	165	130	105
					IPM(FEED)	1	1	1	1	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	190	165	170	170	170
					IPT(fz)	.0014	.0017	.0017	.0017	.0017
					RPM	960	730	640	520	430
					IPM(FEED)	8	7	7	5	4
	11.1-11.2		0.1D	1.5D	SFM(Vc)	40	40	45	45	40
					IPT(fz)	.0006	.0006	.0006	.0006	.0006
					RPM	215	180	165	130	105
					IPM(FEED)	1	1	1	1	1
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	95	85	85	85	85
					IPT(fz)	.0017	.0020	.0021	.0021	.0020
					RPM	480	365	320	260	215
					IPM(FEED)	5	4	4	3	3
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	35	35	35	35	35
					IPT(fz)	.0010	.0009	.0009	.0010	.0010
					RPM	170	145	130	105	85
					IPM(FEED)	1	1	1	1	1
	36-37	Titanium Alloys	0.05D	1.0D	SFM(Vc)	45	45	45	45	45
					IPT(fz)	.0011	.0010	.0010	.0010	.0009
					RPM	220	190	170	140	110
					IPM(FEED)	1	1	1	1	1
H	40	Chilled Cast Iron	0.1D	1.5D	SFM(Vc)	40	40	45	45	40
					IPT(fz)	.0006	.0006	.0006	.0006	.0006
					RPM	215	180	165	130	105
					IPM(FEED)	1	1	1	1	1



※ The Feed, in long & extra long types, should be reduced by around 50%.

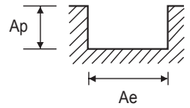
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

E5075, E5105, E5074, E5104 SERIES — 3 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	0.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110	110
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420
					IPM(FEED)	9	8	9	9	8	9	9	7	8	6
	3-4		1.0D	0.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90	90
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2750	1830	1380	1100	920	790	690	550	460	340
					IPM(FEED)	7	7	7	7	7	7	7	6	6	5
	5		1.0D	0.5D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2140	1430	1070	860	710	610	530	430	360	270
					IPM(FEED)	6	5	5	6	5	5	6	5	5	4
	6	Low alloy steel	1.0D	0.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110	110
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420
					IPM(FEED)	9	8	9	9	8	9	9	7	8	6
	7		1.0D	0.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90	90
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2750	1830	1380	1100	920	790	690	550	460	340
					IPM(FEED)	7	7	7	7	7	7	7	6	6	5
	8-9		1.0D	0.5D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2140	1430	1070	860	710	610	530	430	360	270
					IPM(FEED)	6	5	5	6	5	5	6	5	5	4
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110	110
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420
					IPM(FEED)	9	8	9	9	8	9	9	7	8	6
	11.1		1.0D	0.5D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2140	1430	1070	860	710	610	530	430	360	270
					IPM(FEED)	6	5	5	6	5	5	6	5	5	4
M	12-14.2	Stainless steel	1.0D	0.5D	SFM(Vc)	60	60	60	60	60	60	60	60	60	60
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	1830	1220	920	730	610	520	460	370	310	230
					IPM(FEED)	5	4	5	5	5	5	5	4	4	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90	90
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2750	1830	1380	1100	920	790	690	550	460	340
					IPM(FEED)	7	7	7	7	7	7	7	6	6	5



※ The Feed, in long & extra long types, should be reduced by around 50%.

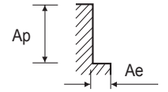
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

E5075, E5105, E5074, E5104 SERIES — 3 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	0.5D	1.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110	110
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420
					IPM(FEED)	9	8	9	9	8	9	9	7	8	6
	3-4		0.5D	1.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90	90
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2750	1830	1380	1100	920	790	690	550	460	340
					IPM(FEED)	7	7	7	7	7	7	7	6	6	5
	5		0.5D	1.5D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2140	1430	1070	860	710	610	530	430	360	270
					IPM(FEED)	6	5	5	6	5	5	6	5	5	4
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110	110
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420
					IPM(FEED)	9	8	9	9	8	9	9	7	8	6
	7		0.5D	1.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90	90
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2750	1830	1380	1100	920	790	690	550	460	340
					IPM(FEED)	7	7	7	7	7	7	7	6	6	5
	8-9		0.5D	1.5D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2140	1430	1070	860	710	610	530	430	360	270
					IPM(FEED)	6	5	5	6	5	5	6	5	5	4
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	110	110	110	110	110	110	110	110	110	110
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	3360	2240	1680	1340	1120	960	840	670	560	420
					IPM(FEED)	9	8	9	9	8	9	9	7	8	6
	11.1		0.5D	1.5D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2140	1430	1070	860	710	610	530	430	360	270
					IPM(FEED)	6	5	5	6	5	5	6	5	5	4
M	12-14.2	Stainless steel	0.05D	1.0D	SFM(Vc)	60	60	60	60	60	60	60	60	60	60
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	1830	1220	920	730	610	520	460	370	310	230
					IPM(FEED)	5	4	5	5	5	5	5	4	4	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	90	90	90	90	90	90	90	90	90	90
					IPT(fz)	.0009	.0012	.0017	.0022	.0025	.0030	.0035	.0037	.0045	.0050
					RPM	2750	1830	1380	1100	920	790	690	550	460	340
					IPM(FEED)	7	7	7	7	7	7	7	6	6	5



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

JET-POWER END MILLS

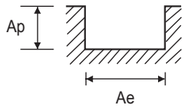
RECOMMENDED CUTTING CONDITIONS

EH094, EH095, EH969, EH970 SERIES

MULTI FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT(fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM(FEED)	91	91	91	95	95	91	85
	5		1.0D	0.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24
	6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT(fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM(FEED)	91	91	91	95	95	91	85
	8-9		1.0D	0.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT(fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM(FEED)	91	91	91	95	95	91	85
	11.1-11.2		1.0D	0.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24
M	12-14.2	Stainless steel	1.0D	D1/4 ~ D3/8 : 0.25D D1/2 ~ D5/8 : 0.15D D3/4 ~ D1 : 0.1D	SFM(Vc)	550	515	500	550	540	490	565
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	8400	6300	5100	4200	3300	2500	2160
					IPM(FEED)	23	23	23	23	20	17	16
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	155	145	130	155	130	135	155
					IPT(fz)	.0008	.0010	.0014	.0016	.0011	.0010	.0012
					RPM	2400	1800	1300	1200	800	675	600
					IPM(FEED)	8	7	8	8	4	4	4
	36-37	Titanium Alloys	1.0D	0.05D	SFM(Vc)	205	190	165	205	170	180	205
					IPT(fz)	.0008	.0010	.0015	.0016	.0011	.0010	.0011
					RPM	3150	2350	1700	1560	1040	910	780
					IPM(FEED)	11	10	10	10	6	6	5
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24



※ The Feed, in long & extra long types, should be reduced by around 50%.

JET-POWER END MILLS

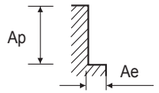
RECOMMENDED CUTTING CONDITIONS

EH094, EH095, EH969, EH970 SERIES

MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT(fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM(FEED)	91	91	91	95	95	91	85
	5		0.3D	1.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT(fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM(FEED)	91	91	91	95	95	91	85
	8-9		0.3D	1.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	1020	950	905	1045	980	1020	1125
					IPT(fz)	.0015	.0020	.0025	.0030	.0032	.0029	.0033
					RPM	15600	11600	9200	8000	6000	5200	4300
					IPM(FEED)	91	91	91	95	95	91	85
	11.1-11.2		0.3D	1.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24
M	12-14.2	Stainless steel	D1/4 ~ D3/8 : 0.15D D1/2 ~ D5/8 : 0.1D D3/4 ~ D1 : 0.05D	1.5D	SFM(Vc)	550	515	500	550	540	490	565
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	8400	6300	5100	4200	3300	2500	2160
					IPM(FEED)	23	23	23	23	20	17	16
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	155	145	130	155	130	135	155
					IPT(fz)	.0008	.0010	.0014	.0016	.0011	.0010	.0012
					RPM	2400	1800	1300	1200	800	675	600
					IPM(FEED)	8	7	8	8	4	4	4
	36-37	Titanium Alloys	0.05D	1.0D	SFM(Vc)	205	190	165	205	170	180	205
					IPT(fz)	.0008	.0010	.0015	.0016	.0011	.0010	.0011
					RPM	3150	2350	1700	1560	1040	910	780
					IPM(FEED)	11	10	10	10	6	6	5
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	810	755	745	785	785	865	840
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0011	.0013
					RPM	12400	9200	7600	6000	4800	4400	3200
					IPM(FEED)	33	33	33	32	30	28	24



※ The Feed, in long & extra long types, should be reduced by around 50%.

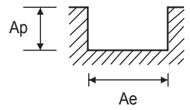
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER END MILLS
HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EH830 SERIES — 3&4 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0012	.0007	.0007
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(FEED)	13	13	12	10	8	7	6	4
	5		1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	8	7	6	5	4	3	3	2
	6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0012	.0007	.0007
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(FEED)	13	13	12	10	8	7	6	4
	8-9		1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	8	7	6	5	4	3	3	2
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0007	.0011	.0012	.0012	.0012	.0012	.0007	.0007
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(FEED)	13	13	12	10	8	7	6	4
	11.1-11.2		1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	8	7	6	5	4	3	3	2
M	12-14.2	Stainless steel	1.0D	0.5D	SFM(Vc)	180	180	180	165	180	180	180	180
					IPT(fz)	.0007	.0010	.0011	.0011	.0013	.0012	.0008	.0009
					RPM	2920	2190	1750	1330	1090	970	880	700
					IPM(FEED)	7	6	6	5	4	3	3	2
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	65	65	65	65	65	65	65	65
					IPT(fz)	.0004	.0006	.0008	.0007	.0008	.0007	.0006	.0005
					RPM	1060	800	640	530	400	350	320	260
					IPM(FEED)	1	1	1	1	1	1	1	1
	36-37	Titanium Alloys	1.0D	0.05D	SFM(Vc)	175	175	175	170	175	175	175	175
					IPT(fz)	.0007	.0010	.0011	.0011	.0012	.0012	.0008	.0009
					RPM	2840	2100	1680	1370	1050	950	840	670
					IPM(FEED)	6	6	6	5	4	3	3	2
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0008	.0009	.0009	.0009	.0010	.0009	.0007	.0007
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	8	7	6	5	4	3	3	2



※ The Feed, in long & extra long types, should be reduced by around 50%.

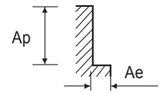
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EH830 SERIES — 3&4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.5D	1.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0015	.0011	.0011
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(FEED)	16	16	14	13	10	9	7	6
	5		0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	10	9	7	6	5	4	4	3
	6-7	Low alloy steel	0.5D	1.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0015	.0011	.0011
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(FEED)	16	16	14	13	10	9	7	6
	8-9		0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	10	9	7	6	5	4	4	3
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	345	345	330	345	360	360	345	345
					IPT(fz)	.0009	.0013	.0015	.0015	.0015	.0015	.0011	.0011
					RPM	5570	4180	3180	2790	2190	1950	1670	1340
					IPM(FEED)	16	16	14	13	10	9	7	6
	11.1-11.2		0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	10	9	7	6	5	4	4	3
M	12-14.2	Stainless steel	0.5D	1.5D	SFM(Vc)	180	180	180	165	180	180	180	180
					IPT(fz)	.0011	.0017	.0018	.0017	.0019	.0018	.0013	.0013
					RPM	2920	2190	1750	1330	1090	970	880	700
					IPM(FEED)	10	11	10	7	6	5	5	4
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	65	65	65	65	65	65	65	65
					IPT(fz)	.0007	.0008	.0010	.0011	.0011	.0011	.0009	.0009
					RPM	1060	800	640	530	400	350	320	260
					IPM(FEED)	2	2	2	2	1	1	1	1
	36-37	Titanium Alloys	0.05D	1.0D	SFM(Vc)	180	180	180	165	180	180	180	180
					IPT(fz)	.0011	.0017	.0018	.0017	.0019	.0018	.0013	.0013
					RPM	2920	2190	1750	1330	1090	970	880	700
					IPM(FEED)	10	11	10	7	6	5	5	4
H	40	Chilled Cast Iron	0.5D	1.5D	SFM(Vc)	215	215	215	215	230	230	215	215
					IPT(fz)	.0010	.0012	.0012	.0012	.0011	.0012	.0009	.0009
					RPM	3450	2590	2070	1720	1390	1240	1040	830
					IPM(FEED)	10	9	7	6	5	4	4	3



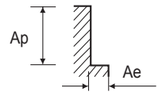
※ The Feed, in long & extra long types, should be reduced by around 50%.

JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EE515 SERIES — 4&6 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.1D	1.5D	SFM(Vc)	135	150	155	160	165	165	165	165	165	165	165	165
					IPT(fz)	.0004	.0006	.0008	.0009	.0013	.0017	.0019	.0019	.0015	.0015	.0017	.0018
					RPM	4400	3600	3000	2600	2000	1600	1320	1160	1000	900	800	640
					IPM(FEED)	7	8	9	9	10	11	10	9	9	8	8	7
	5		0.1D	1.5D	SFM(Vc)	35	35	40	35	40	40	40	40	40	40	40	45
					IPT(fz)	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0009	.0007	.0007	.0008	.0010
					RPM	1100	900	750	600	500	410	340	290	250	225	200	165
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	1	1
	6-7	Low alloy steel	0.1D	1.5D	SFM(Vc)	135	150	155	160	165	165	165	165	165	165	165	165
					IPT(fz)	.0004	.0006	.0008	.0009	.0013	.0017	.0019	.0019	.0015	.0015	.0017	.0018
					RPM	4400	3600	3000	2600	2000	1600	1320	1160	1000	900	800	640
					IPM(FEED)	7	8	9	9	10	11	10	9	9	8	8	7
	8-9		0.1D	1.5D	SFM(Vc)	35	35	40	35	40	40	40	40	40	40	40	45
					IPT(fz)	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0009	.0007	.0007	.0008	.0010
					RPM	1100	900	750	600	500	410	340	290	250	225	200	165
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	1	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	135	150	155	160	165	165	165	165	165	165	165	165
					IPT(fz)	.0004	.0006	.0008	.0009	.0013	.0017	.0019	.0019	.0015	.0015	.0017	.0018
					RPM	4400	3600	3000	2600	2000	1600	1320	1160	1000	900	800	640
					IPM(FEED)	7	8	9	9	10	11	10	9	9	8	8	7
	11.1-11.2		0.1D	1.5D	SFM(Vc)	35	35	40	35	40	40	40	40	40	40	40	45
					IPT(fz)	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0009	.0007	.0007	.0008	.0010
					RPM	1100	900	750	600	500	410	340	290	250	225	200	165
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	1	1
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	70	75	75	80	80	80	80	85	80	85	80	80
					IPT(fz)	.0005	.0007	.0008	.0012	.0015	.0022	.0023	.0026	.0017	.0019	.0021	.0021
					RPM	2200	1800	1500	1300	1000	800	660	580	500	450	400	320
					IPM(FEED)	4	5	5	6	6	7	6	6	5	5	5	4
S	31-37	Heat Resistant Super Alloys Titanium Alloys	0.05D	1.0D	SFM(Vc)	25	30	30	30	35	35	35	35	35	35	35	35
					IPT(fz)	.0003	.0007	.0004	.0005	.0006	.0008	.0009	.0011	.0008	.0009	.0010	.0013
					RPM	880	720	600	480	400	330	270	230	200	180	160	130
					IPM(FEED)	1	2	1	1	1	1	1	1	1	1	1	1
H	40	Chilled Cast Iron	0.1D	1.5D	SFM(Vc)	865	940	980	940	1045	1075	1070	1065	1045	1060	1045	1080
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0007	.0007	.0006	.0006
					RPM	1100	900	750	600	500	410	340	290	250	225	200	165
					IPM(FEED)	1	1	1	1	1	1	1	1	1	1	1	1



※ The Feed, in long & extra long types, should be reduced by around 50%.

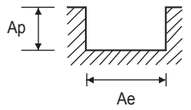
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EH852, EH831 SERIES — MULTI FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0012	.0016	.0015	.0018	.0021	.0024	.0026	.0027	.0024
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(FEED)	55	55	55	57	57	57	55	51	51
	5		1.0D	0.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0005	.0007	.0006	.0008	.0009	.0009	.0009	.0009	.0009
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	19	20	19	19	20	18	17	14	14
	6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0012	.0016	.0015	.0018	.0021	.0024	.0026	.0027	.0024
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(FEED)	55	55	55	57	57	57	55	51	51
	8-9		1.0D	0.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0005	.0007	.0006	.0008	.0009	.0009	.0009	.0009	.0009
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	19	20	19	19	20	18	17	14	14
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0012	.0016	.0015	.0018	.0021	.0024	.0026	.0027	.0024
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(FEED)	55	55	55	57	57	57	55	51	51
	11.1-11.2		1.0D	0.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0005	.0007	.0006	.0008	.0009	.0009	.0009	.0009	.0009
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	19	20	19	19	20	18	17	14	14
M	12-14.2	Stainless steel	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0005	.0007	.0007	.0008	.0009	.0009	.0009	.0009	.0009
					RPM	8380	6290	5090	4190	3590	3300	2710	2400	2170
					IPM(FEED)	13	13	14	13	14	12	10	9	10
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	150	150	135	145	130	130	130	135	155
					IPT(fz)	.0006	.0008	.0009	.0010	.0009	.0008	.0008	.0009	.0009
					RPM	2390	1790	1310	1190	910	800	710	650	600
					IPM(FEED)	5	4	5	5	3	3	2	2	3
	36-37	Titanium Alloys	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0005	.0007	.0007	.0008	.0009	.0009	.0009	.0009	.0009
					RPM	8380	6290	5090	4190	3590	3300	2710	2400	2170
					IPM(FEED)	13	13	14	13	14	12	10	9	10
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0005	.0007	.0006	.0008	.0009	.0009	.0009	.0009	.0009
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	19	20	19	19	20	18	17	14	14



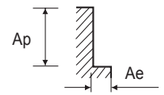
※ The Feed, in long & extra long types, should be reduced by around 50%.

JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EH852, EH831 SERIES — MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0020	.0026	.0025	.0030	.0035	.0039	.0044	.0044	.0039
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(FEED)	92	92	91	95	94	95	92	86	85
	5		0.3D	1.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	34	33	34	31	33	30	28	22	25
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0020	.0026	.0025	.0030	.0035	.0039	.0044	.0044	.0039
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(FEED)	92	92	91	95	94	95	92	86	85
	8-9		0.3D	1.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	34	33	34	31	33	30	28	22	25
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	980	990	965	990	1110
					IPT(fz)	.0020	.0026	.0025	.0030	.0035	.0039	.0044	.0044	.0039
					RPM	15600	11620	9200	8010	6800	6010	5200	4810	4300
					IPM(FEED)	92	92	91	95	94	95	92	86	85
	11.1-11.2		0.3D	1.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	34	33	34	31	33	30	28	22	25
M	12-14.2	Stainless steel	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.5D	SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015	.0015	.0015	.0015
					RPM	8380	6290	5090	4190	3590	3300	2710	2400	2170
					IPM(FEED)	23	22	22	22	23	20	17	14	16
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	150	150	135	145	130	130	130	135	155
					IPT(fz)	.0010	.0013	.0015	.0016	.0014	.0013	.0014	.0015	.0015
					RPM	2390	1790	1310	1190	910	800	710	650	600
					IPM(FEED)	7	7	8	8	5	4	4	4	4
	36-37	Titanium Alloys	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.0D	SFM(Vc)	520	520	525	520	520	545	505	495	560
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0015	.0015	.0015	.0015
					RPM	8380	6290	5090	4190	3590	3300	2710	2400	2170
					IPM(FEED)	23	22	22	22	23	20	17	14	16
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	765	760	785	740	750	790	815	740	825
					IPT(fz)	.0009	.0012	.0011	.0013	.0016	.0016	.0016	.0015	.0015
					RPM	12410	9190	7610	6000	5210	4800	4400	3600	3200
					IPM(FEED)	34	33	34	31	33	30	28	22	25



※ The Feed, in long & extra long types, should be reduced by around 50%.

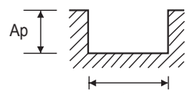
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

JET-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EH917, EH921 SERIES — MULTI FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0009	.0012	.0015	.0018	.0019	.0018
					RPM	15600	11620	9200	8010	6010	4810
					IPM(FEED)	54	55	55	57	57	51
	5		1.0D	0.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	20	20	19	19	18	14
	6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0009	.0012	.0015	.0018	.0019	.0018
					RPM	15600	11620	9200	8010	6010	4810
					IPM(FEED)	54	55	55	57	57	51
	8-9		1.0D	0.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	20	20	19	19	18	14
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0009	.0012	.0015	.0018	.0019	.0018
					RPM	15600	11620	9200	8010	6010	4810
					IPM(FEED)	54	55	55	57	57	51
	11.1-11.2		1.0D	0.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	20	20	19	19	18	14
M	12-14.2	Stainless steel	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	520	520	525	520	545	495
					IPT(fz)	.0004	.0005	.0007	.0008	.0007	.0006
					RPM	8380	6290	5090	4190	3300	2400
					IPM(FEED)	13	13	14	13	12	9
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	150	150	135	145	130	135
					IPT(fz)	.0005	.0006	.0009	.0010	.0006	.0006
					RPM	2390	1790	1310	1190	800	650
					IPM(FEED)	5	4	5	5	3	2
	36-37	Titanium Alloys	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	520	520	525	520	545	495
					IPT(fz)	.0004	.0005	.0007	.0008	.0007	.0006
					RPM	8380	6290	5090	4190	3300	2400
					IPM(FEED)	13	13	14	13	12	9
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0004	.0006	.0006	.0008	.0007	.0006
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	20	20	19	19	18	14



※ The Feed, in long & extra long types, should be reduced by around 50%.

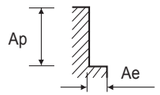
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

EH917, EH921 SERIES — MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0015	.0020	.0025	.0030	.0031	.0030
					RPM	15600	11620	9200	8010	6010	4810
					IPM(FEED)	91	91	91	95	95	85
	5		0.3D	1.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	33	33	34	31	30	22
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0015	.0020	.0025	.0030	.0031	.0030
					RPM	15600	11620	9200	8010	6010	4810
					IPM(FEED)	91	91	91	95	95	85
	8-9		0.3D	1.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	33	33	34	31	30	22
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	965	960	950	990	990	990
					IPT(fz)	.0015	.0020	.0025	.0030	.0031	.0030
					RPM	15600	11620	9200	8010	6010	4810
					IPM(FEED)	91	91	91	95	95	85
	11.1-11.2		0.3D	1.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	33	33	34	31	30	22
M	12-14.2	Stainless steel	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.5D	SFM(Vc)	520	520	525	520	545	495
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0010
					RPM	8380	6290	5090	4190	3300	2400
					IPM(FEED)	22	23	22	22	20	14
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	150	150	135	145	130	135
					IPT(fz)	.0008	.0010	.0015	.0016	.0011	.0010
					RPM	2390	1790	1310	1190	800	650
					IPM(FEED)	8	7	8	8	4	4
	36-37	Titanium Alloys	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.0D	SFM(Vc)	520	520	525	520	545	495
					IPT(fz)	.0007	.0009	.0011	.0013	.0012	.0010
					RPM	8380	6290	5090	4190	3300	2400
					IPM(FEED)	22	23	22	22	20	14
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	765	760	785	740	790	740
					IPT(fz)	.0007	.0009	.0011	.0013	.0013	.0010
					RPM	12410	9190	7610	6000	4800	3600
					IPM(FEED)	33	33	34	31	30	22



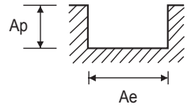
※ The Feed, in long & extra long types, should be reduced by around 50%.

JET-POWER END MILLS
RECOMMENDED CUTTING CONDITIONS

EH919 SERIES — MULTI FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 4.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	0.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(FEED)	55	54	55	55	57	56	57	51	51
	5		1.0D	0.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	20	20	20	19	19	19	18	14	14
	6-7	Low alloy steel	1.0D	0.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(FEED)	55	54	55	55	57	56	57	51	51
	8-9		1.0D	0.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	20	20	20	19	19	19	18	14	14
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(FEED)	55	54	55	55	57	56	57	51	51
	11.1-11.2		1.0D	0.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	20	20	20	19	19	19	18	14	14
M	12-14.2	Stainless steel	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	520	520	520	525	520	520	545	495	560
					IPT(fz)	.0004	.0004	.0005	.0007	.0008	.0007	.0007	.0006	.0007
					RPM	12570	8380	6290	5090	4190	3590	3300	2400	2170
					IPM(FEED)	13	13	13	14	13	13	12	9	10
S	31-35	Heat Resistant Super Alloys	1.0D	0.05D	SFM(Vc)	150	150	150	135	145	130	130	135	155
					IPT(fz)	.0004	.0005	.0006	.0009	.0010	.0007	.0006	.0006	.0007
					RPM	3580	2390	1790	1310	1190	910	800	650	600
					IPM(FEED)	5	5	4	5	5	3	3	2	3
	36-37	Titanium Alloys	1.0D	D4~10:0.25D D12~16:0.15D D18~25:0.1D	SFM(Vc)	520	520	520	525	520	520	545	495	560
					IPT(fz)	.0004	.0004	.0005	.0007	.0008	.0007	.0007	.0006	.0007
					RPM	12570	8380	6290	5090	4190	3590	3300	2400	2170
					IPM(FEED)	13	13	13	14	13	13	12	9	10
H	40	Chilled Cast Iron	1.0D	0.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	20	20	20	19	19	19	18	14	14



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

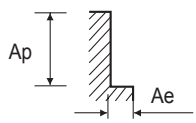
JET-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

EH919 SERIES MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 4.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0
P	1	Non-alloy steel	0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0013	.0015	.0020	.0025	.0030	.0028	.0031	.0030	.0033
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(FEED)	91	91	91	91	95	95	95	85	84
	2-4		0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(FEED)	55	54	55	55	57	56	57	51	51
	5		0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0013	.0010	.0013
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	33	33	33	34	31	33	30	22	24
	6-7	Low alloy steel	0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(FEED)	55	54	55	55	57	56	57	51	51
	8-9		0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0013	.0010	.0013
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	33	33	33	34	31	33	30	22	24
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	965	965	960	950	990	980	990	990	1110
					IPT(fz)	.0008	.0009	.0012	.0015	.0018	.0017	.0019	.0018	.0020
					RPM	23400	15600	11620	9200	8010	6800	6010	4810	4300
					IPM(FEED)	55	54	55	55	57	56	57	51	51
	11.1-11.2		0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0013	.0010	.0013
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	33	33	33	34	31	33	30	22	24
M	12-14.2	Stainless steel	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.5D	SFM(Vc)	520	520	520	525	520	520	545	495	560
					IPT(fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0012	.0010	.0013
					RPM	12570	8380	6290	5090	4190	3590	3300	2400	2170
					IPM(FEED)	22	22	23	22	22	23	20	14	16
S	31-35	Heat Resistant Super Alloys	0.05D	1.0D	SFM(Vc)	150	150	150	135	145	130	130	135	155
					IPT(fz)	.0007	.0008	.0010	.0015	.0016	.0011	.0011	.0010	.0012
					RPM	3580	2390	1790	1310	1190	910	800	650	600
					IPM(FEED)	8	8	7	8	8	5	4	4	4
	36-37	Titanium Alloys	D4~10:0.15D D12~16:0.1D D18~25:0.05D	1.0D	SFM(Vc)	520	520	520	525	520	520	545	495	560
					IPT(fz)	.0006	.0007	.0009	.0011	.0013	.0013	.0012	.0010	.0013
					RPM	12570	8380	6290	5090	4190	3590	3300	2400	2170
					IPM(FEED)	22	22	23	22	22	23	20	14	16
H	40	Chilled Cast Iron	0.3D	1.5D	SFM(Vc)	770	765	760	785	740	750	790	740	825
					IPT(fz)	.0004	.0004	.0006	.0006	.0008	.0007	.0007	.0006	.0007
					RPM	18620	12410	9190	7610	6000	5210	4800	3600	3200
					IPM(FEED)	20	20	20	19	19	19	18	14	14



※ The Feed, in long & extra long types, should be reduced by around 50%.

YG

Leading Through Innovation

SOLID CARBIDE

V7 PLUS A END MILLS

- High Performance Carbide End Mills for Steels, Cast Iron and Stainless Steels

SELECTION GUIDE

YG MILLING TOOLS

INCH

SOLID CARBIDE
V7 PLUS A END MILLS

High Performance Carbide End Mills
for Steels, Cast Iron and Stainless Steels

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C621

| | | |

SELECTION GUIDE

YG MILLING TOOLS

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V7 PLUS A END MILLS

High Performance Carbide End Mills
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Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C621

						Metric					
					SERIES	GMF52 GMF56	GMF54 GMF58	GMG55	GMF53 GMF57	GMF55 GMF59	GMG56
					FLUTE	4			4		
					HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)
					CUTTING EDGE SHAPE	CHAMFER	CORNER RADIUS	BALL NOSE	CHAMFER	CORNER RADIUS	BALL NOSE
					SIZE MIN	3.0	3.0	3.0	3.0	3.0	3.0
					SIZE MAX	25.0	25.0	25.0	25.0	25.0	25.0
					PAGE	C607			C608		
						-			-		
						Y-Coating			Y-Coating		
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc						
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎	◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60							
	22		Curable	Hardened	100							
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75							
	24		≤ 12% Si, Curable	Hardened	90							
	25		> 12% Si, Not Curable		130							
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110							
	27		CuZn, CuSnZn (Brass)		90							
	28		CuSn, lead Free copper and electrolytic copper		100							
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic									
	30		Rubber, Wood, etc.									
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○	○	○
	32			Cured	280	30	○	○	○	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○	○	○	○
	34			Cured	350	38	○	○	○	○	○	○
	35			Cast	320	34	○	○	○	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		○	○	○	○	○	○
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	○	○	○	○
H	38	Hardened steel		Hardened	550	55						
	39			Hardened	630	60						
	40	Chilled Cast Iron		Cast	400	42						
	41	Hardened Cast Iron		Hardened	550	55						

						Metric											
					SERIES	GMF60	GMF62	GMF61	GMF63	GMG12 GMG14	GMG16 GMG18	GMG13 GMG15	GMG17 GMG19	GMH56	GMH58	GMH57	GMH59
					FLUTE	4		4		6		6		6		6	
					HELIX ANGLE	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	35°/37° (MULTIPLE HELIX)	45°	45°	45°	45°	45°	45°	45°	45°
					CUTTING EDGE SHAPE	CHAMFER	CORNER RADIUS	CHAMFER	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS
					SIZE MIN	3.0	3.0	3.0	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
					SIZE MAX	20.0	20.0	20.0	20.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
					PAGE	C609		C610		C616		C617		C619		C620	
						EXTENDED REACH		EXTENDED REACH		-		-		-		-	
						Y-Coating		Y-Coating		Y-Coating		Y-Coating		Y-Coating		Y-Coating	
														CHIP SPLITTER	CHIP SPLITTER	CHIP SPLITTER	CHIP SPLITTER
P	1					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	2					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	3					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	4					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	5					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	6					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	7					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	8					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	9					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	10					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	11					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
M	12					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	13					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	14					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
K	15					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	16					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	17					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	18					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	19					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
	20					◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
N	21																
	22																
	23																
	24																
	25																
	26																
	27																
	28																
	29																
	30																
S	31					○	○	○	○	○	○	○	○	○	○	○	○
	32					○	○	○	○	○	○	○	○	○	○	○	○
	33					○	○	○	○	○	○	○	○	○	○	○	○
	34					○	○	○	○	○	○	○	○	○	○	○	○
	35					○	○	○	○	○	○	○	○	○	○	○	○
	36					○	○	○	○	○	○	○	○	○	○	○	○
	37					○	○	○	○	○	○	○	○	○	○	○	○
H	38																
	39																
	40																
	41																

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
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ALU-POWER END MILLS
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ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

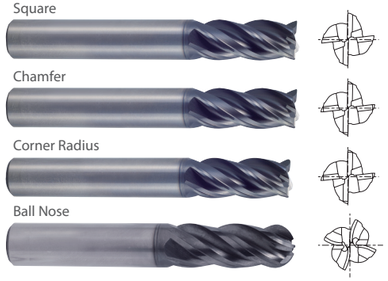
V7 PLUS A END MILLS

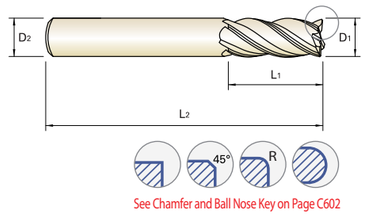
SQUARE **UGMF68** CHAMFER **UGMF76**
CORNER RADIUS **UGMF70** BALL NOSE **UGMG53**

CARBIDE, 4 FLUTE MULTIPLE LENGTH

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

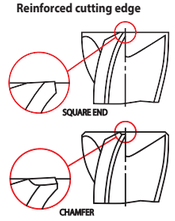
Square
Chamfer
Corner Radius
Ball Nose





See Chamfer and Ball Nose Key on Page C602

Reinforced cutting edge



CARBIDE | 4 | 35°/37° | R ±.0008 | PLAIN | C x 45° | Y Coating

p.C621, C623

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Chamfer	Corner Radius								Ball Nose
						.010	.015	.030	.060	.090	.125	.190	.250	
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/8	1/8	1/8	1-1/2	UGMF68008		UGMF70008		UGMF70955						UGMG53901
		3/8	1-1/2	UGMF68901		UGMF70901		UGMF70902						UGMG53008
		1/2	2-1/2	UGMF68S915		UGMF70S956		UGMF70S957						UGMG53S902
5/32	3/16	3/16	2	UGMF68010		UGMF70010								UGMG53903
		7/16	2	UGMF68902		UGMF70958								UGMG53010
		3/16	2	UGMF68012		UGMF70012								UGMG53904
3/16	3/16	5/16	2	UGMF68916		UGMF70959		UGMF70960						UGMG53905
		7/16	2	UGMF68903		UGMF70903		UGMF70904						UGMG53012
		5/8	2-1/2	UGMF68S917		UGMF70S961		UGMF70S962						UGMG53S906
7/32	1/4	1/4	2	UGMF68014		UGMF70014								UGMG53907
		7/16	2-1/2	UGMF68904		UGMF70963								UGMG53014
1/4	1/4	3/8	2	UGMF68016	UGMF76016	UGMF70016		UGMF70905	UGMF70906					UGMG53908
		1/2	2-1/2	UGMF68918			UGMF70964	UGMF70965	UGMF70966					UGMG53016
		3/4	2-1/2	UGMF68905	UGMF76902	UGMF70907	UGMF70908	UGMF70909	UGMF70967					UGMG53909
		1	3	UGMF68S919			UGMF70S968	UGMF70S969	UGMF70S970					UGMG53S910
9/32	5/16	5/8	2-1/2	UGMF68018			UGMF70018	UGMF70971	UGMF70972					UGMG53018
		1	3	UGMF68S920			UGMF70S973	UGMF70S974						UGMG53S911
5/16	5/16	7/16	2	UGMF68020				UGMF70020						UGMG53912
		13/16	2-1/2	UGMF68906	UGMF76020	UGMF70910		UGMF70911	UGMF70912					UGMG53020
		1-1/4	3	UGMF68S921			UGMF70S975	UGMF70S976	UGMF70S977					UGMG53S913
11/32	3/8	1/2	2-1/2	UGMF68022				UGMF70022						UGMG53914
		13/16	2-1/2	UGMF68922				UGMF70978						UGMG53022

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ▶

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

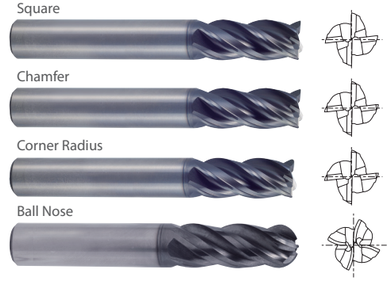
V7 PLUS A END MILLS

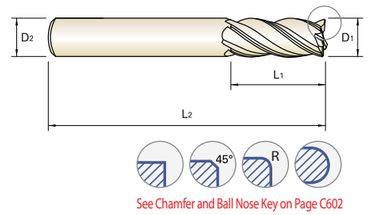
SQUARE UGMF68 CHAMFER UGMF76
CORNER RADIUS UGMF70 BALL NOSE UGMG53

CARBIDE, 4 FLUTE MULTIPLE LENGTH

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

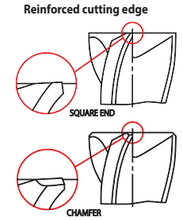
Square
Chamfer
Corner Radius
Ball Nose





See Chamfer and Ball Nose Key on Page C602

Reinforced cutting edge



CARBIDE | 4 | 35°/37° | R ±.0008 | PLAIN | C x 45° | Y Coating

p.C621, C623

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Chamfer	Corner Radius								Ball Nose
						.010	.015	.030	.060	.090	.125	.190	.250	
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	1/2	2-1/2	UGMF68024	UGMF76903	UGMF70024		UGMF70913	UGMF70914	UGMF70979				UGMG53915
		7/8	2-1/2	UGMF68907	UGMF76024	UGMF70915		UGMF70916	UGMF70917	UGMF70980				UGMG53024
		1	3	UGMF68923		UGMF70981		UGMF70982	UGMF70983	UGMF70984				UGMG53916
		1-1/4	3	UGMF68S924		UGMF70S985		UGMF70S986	UGMF70S987	UGMF70S988				UGMG53S917
13/32	7/16	1/2	2-3/4	UGMF68026				UGMF70026						UGMG53026
		15/16	2-3/4	UGMF68925				UGMF70989						UGMG53918
7/16	7/16	5/8	2-1/2	UGMF68028			UGMF70028	UGMF70918	UGMF70990	UGMF70991				UGMG53919
		7/8	2-3/4	UGMF68926	UGMF76028		UGMF70992	UGMF70993	UGMF70994	UGMF70995				UGMG53920
		1	2-3/4	UGMF68908		UGMF70919		UGMF70920	UGMF70921					UGMG53028
15/32	1/2	5/8	2-1/2	UGMF68030				UGMF70030						UGMG53030
		1	3	UGMF68927				UGMF70996						UGMG53921
		1-1/4	3-1/2	UGMF68928				UGMF70997						UGMG53922
1/2	1/2	5/8	2-1/2	UGMF68032	UGMF76032	UGMF70032	UGMF70922	UGMF70923	UGMF70924	UGMF70998	UGMF70999			UGMG53923
		1	3	UGMF68909	UGMF76904	UGMF70925	UGMF70801	UGMF70926	UGMF70927	UGMF70802	UGMF70928			UGMG53032
		1 1/4	3	UGMF68941	UGMF76913	UGMF70899	UGMF70701	UGMF70702	UGMF70703	UGMF70704	UGMF70705			UGMG53941
		1-1/4	3-1/2	UGMF68910	UGMF76901	UGMF70929	UGMF70930	UGMF70931	UGMF70932	UGMF70803	UGMF70933			UGMG53924
		1-5/8	4	UGMF68S929	UGMF76S905		UGMF70S804	UGMF70S805	UGMF70S806	UGMF70S807	UGMF70S808			UGMG53S925
		2	4	UGMF68S939			UGMF70S889	UGMF70S890	UGMF70S891	UGMF70S892	UGMF70S893			UGMG53S939
		2-1/2	4-1/2	UGMF68S940	UGMF76S906		UGMF70S894	UGMF70S895	UGMF70S896	UGMF70S897	UGMF70S898			UGMG53S940

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ▶

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

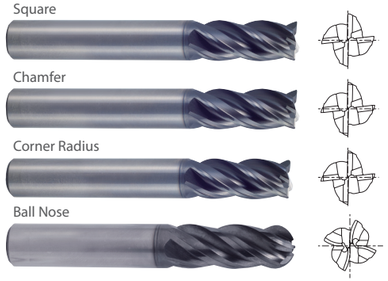
V7 PLUS A END MILLS

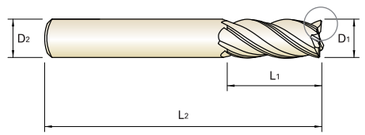
SQUARE **UGMF68** CHAMFER **UGMF76**
CORNER RADIUS **UGMF70** BALL NOSE **UGMG53**

CARBIDE, 4 FLUTE MULTIPLE LENGTH

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

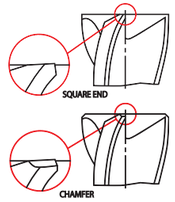
Square
Chamfer
Corner Radius
Ball Nose





See Chamfer and Ball Nose Key on Page C602

Reinforced cutting edge



CARBIDE | 4 | 35°/37° | R ±.0008 | PLAIN | C x 45° | Y Coating

p.C621, C623

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Chamfer	Corner Radius								Ball Nose
						.010	.015	.030	.060	.090	.125	.190	.250	
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
		3/4	3	UGMF68040		UGMF70040	UGMF70809	UGMF70934	UGMF70935	UGMF70810	UGMF70811			UGMG53926
		1-1/4	3-1/2	UGMF68911	UGMF76040	UGMF70936	UGMF70937	UGMF70938	UGMF70939	UGMF70812	UGMF70940			UGMG53040
5/8	5/8	1-5/8	4	UGMF68930	UGMF76907		UGMF70813	UGMF70814	UGMF70815	UGMF70816	UGMF70817			UGMG53927
		2	4	UGMF68S931			UGMF70S818	UGMF70S819	UGMF70S820	UGMF70S821	UGMF70S822			UGMG53S928
		3-1/4	6	UGMF68S932			UGMF70S823	UGMF70S824	UGMF70S825	UGMF70S826	UGMF70S827			UGMG53S929
		3/4	3	UGMF68048	UGMF76908		UGMF70828	UGMF70048	UGMF70941	UGMF70829	UGMF70830	UGMF70831	UGMF70832	UGMG53930
		1-1/2	4	UGMF68912	UGMF76048		UGMF70942	UGMF70943	UGMF70944	UGMF70833	UGMF70945	UGMF70834	UGMF70835	UGMG53048
3/4	3/4	1-7/8	4	UGMF68933			UGMF70836	UGMF70837	UGMF70838	UGMF70839	UGMF70840	UGMF70841	UGMF70842	UGMG53931
		2-1/4	5	UGMF68934	UGMF76909		UGMF70843	UGMF70844	UGMF70845	UGMF70846	UGMF70847	UGMF70848	UGMF70849	UGMG53932
		3-1/4	6	UGMF68S935			UGMF70S850	UGMF70S851	UGMF70S852	UGMF70S853	UGMF70S854	UGMF70S855	UGMF70S856	UGMG53S933
		1	4	UGMF68064	UGMF76910		UGMF70064	UGMF70946	UGMF70947	UGMF70857	UGMF70858	UGMF70859	UGMF70860	UGMG53934
		1-1/2	4	UGMF68913	UGMF76064		UGMF70948	UGMF70949	UGMF70950	UGMF70861	UGMF70951	UGMF70862	UGMF70863	UGMG53064
1	1	2	5	UGMF68914	UGMF76911		UGMF70952	UGMF70953	UGMF70954	UGMF70864	UGMF70865	UGMF70866	UGMF70867	UGMG53935
		2-5/8	5	UGMF68936	UGMF76912		UGMF70868	UGMF70869	UGMF70870	UGMF70871	UGMF70872	UGMF70873	UGMF70874	UGMG53936
		3	6	UGMF68937			UGMF70875	UGMF70876	UGMF70877	UGMF70878	UGMF70879	UGMF70880	UGMF70881	UGMG53937
		4-1/4	7	UGMF68S938			UGMF70S882	UGMF70S883	UGMF70S884	UGMF70S885	UGMF70S886	UGMF70S887	UGMF70S888	UGMG53S938

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

CHAMFER KEY	
Mill Diameter	Chamfer Size
1/4	.007
5/16	.007
3/8	.011
7/16	.013
1/2	.013
5/8	.015
3/4	.019
1	.019

BALL NOSE KEY			
Mill Diameter	Radius of Ball	Mill Diameter	Radius of Ball
1/8	1/16	11/32	11/64
5/32	5/64	3/8	3/16
3/16	3/32	7/16	7/32
7/32	7/64	1/2	1/4
1/4	1/8	5/8	5/16
9/32	9/64	3/4	3/8
5/16	5/32	1	1/2

◎ : Excellent ○ : Good

ISO	P																				M						K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel										Stainless steel						Grey cast iron				Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20												
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21												
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230												
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎												

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

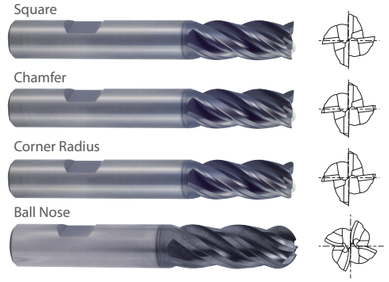
V7 PLUS A END MILLS

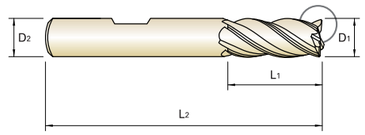
SQUARE **UGMF69** CHAMFER **UGMF77**
CORNER RADIUS **UGMF71** BALL NOSE **UGMG54**

CARBIDE, 4 FLUTE MULTIPLE LENGTH

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

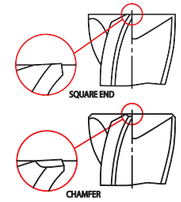
Square
Chamfer
Corner Radius
Ball Nose





See Chamfer and Ball Nose Key on Page C602

Reinforced cutting edge



CARBIDE | 4 | 35°/37° | R ±.0008 | FLAT | C x 45° | Y Coating

p.C621, C623

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Chamfer	Corner Radius						Ball Nose
						.010	.015	.030	.060	.090	.125	
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
11/32	3/8	1/2	2-1/2	UGMF69022								
		13/16	2-1/2									UGMG54022
3/8	3/8	1/2	2-1/2	UGMF69024	UGMF77902	UGMF71024		UGMF71913	UGMF71914			
		7/8	2-1/2	UGMF69907	UGMF77024	UGMF71915		UGMF71916	UGMF71917			UGMG54024
7/16	7/16	5/8	2-1/2	UGMF69028			UGMF71028	UGMF71918				
		1	2-3/4	UGMF69908		UGMF71919		UGMF71920	UGMF71921			UGMG54028
1/2	1/2	5/8	2-1/2	UGMF69032	UGMF77032	UGMF71032	UGMF71922	UGMF71923	UGMF71924			
		1	3	UGMF69909	UGMF77903	UGMF71925		UGMF71926	UGMF70927		UGMF71928	UGMG54032
		1 1/4	3	UGMF69917	UGMF77908	UGMF71985	UGMF71986	UGMF71987	UGMF71988	UGMF71989	UGMF71990	UGMG54903
		1-1/4	3-1/2	UGMF69910	UGMF77901	UGMF71929	UGMF71930	UGMF71931	UGMF71932		UGMF71933	
		2	4	UGMF69S915			UGMF71S955	UGMF71S956	UGMF71S957	UGMF71S958	UGMF71S959	UGMG54S901
		2-1/2	4-1/2	UGMF69S916			UGMF71S960	UGMF71S961	UGMF71S962	UGMF71S963	UGMF71S964	UGMG54S902
5/8	5/8	3/4	3	UGMF69040	UGMF77904	UGMF71040		UGMF71934	UGMF71935			
		1-1/4	3-1/2	UGMF69911	UGMF77040	UGMF71936	UGMF71937	UGMF71938	UGMF71939		UGMF71940	UGMG54040
3/4	3/4	3/4	3	UGMF69048	UGMF77905			UGMF71048	UGMF71941			
		1-1/2	4	UGMF69912	UGMF77048		UGMF71942	UGMF71943	UGMF71944		UGMF71945	UGMG54048
1	1	1	4	UGMF69064	UGMF77906		UGMF71064	UGMF71946	UGMF71947			
		1-1/2	4	UGMF69913	UGMF77064		UGMF71948	UGMF71949	UGMF71950		UGMF71951	UGMG54064
		2	5	UGMF69914	UGMF77907		UGMF71952	UGMF71953	UGMF71954			

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P																				M						K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel										Stainless steel						Grey cast iron				Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20												
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21												
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230												
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎												

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

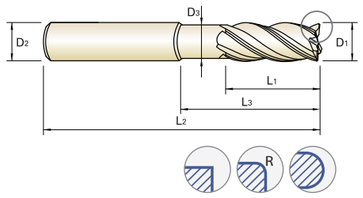
YG V7 PLUS A END MILLS

SQUARE **UGMF72 SERIES**
CORNER RADIUS **UGMF74 SERIES**
BALL NOSE **UGMH10 SERIES**

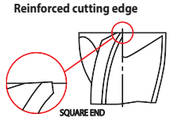
CARBIDE, 4 FLUTE EXTENDED REACH

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
▶ Advanced coating for superior performance and tool life

Square
Corner Radius
Ball Nose



Ball Nose Key on Page C602



CARBIDE | 4 | 35°/37° | R ±.0008 | PLAIN | Y Coating | p.C621, C623

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Square End	Corner Radius								Ball Nose
							.010	.015	.030	.060	.090	.125	.190	.250	
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
		5/32	3/8	3	.113	UGMF72008	UGMF74008		UGMF74913						UGMH10008
1/8	1/8	5/32	1/2	3	.113	UGMF72913	UGMF74914		UGMF74915						UGMH10901
		5/32	5/8	3	.113	UGMF72914	UGMF74916		UGMF74917						UGMH10902
		7/32	1/2	3	.176	UGMF72012	UGMF74012		UGMF74918						UGMH10012
3/16	3/16	7/32	3/4	3	.176	UGMF72915	UGMF74919		UGMF74920						UGMH10903
		7/32	1	3	.176	UGMF72916	UGMF74921		UGMF74922						UGMH10904
		3/8	3/4	4	.230	UGMF72016		UGMF74016	UGMF74923	UGMF74924					UGMH10016
1/4	1/4	3/8	1-1/8	4	.230	UGMF72901		UGMF74901	UGMF74925	UGMF74926					UGMH10905
		3/8	2-1/8	4	.230	UGMF72902		UGMF74902	UGMF74927	UGMF74928					UGMH10906
		1/2	1-1/8	4	.344	UGMF72024		UGMF74929	UGMF74024	UGMF74930	UGMF74931				UGMH10024
		1/2	2-1/8	4	.344	UGMF72903		UGMF74932	UGMF74903	UGMF74933	UGMF74934				UGMH10907
3/8	3/8	1/2	3-1/8	5	.344	UGMF72922		UGMF74815	UGMF74816	UGMF74817	UGMF74818				UGMH10922
		1/2	3-1/8	6	.344	UGMF72904		UGMF74935	UGMF74904	UGMF74936	UGMF74937				UGMH10908
		1/2	4-1/8	6	.344	UGMF72917		UGMF74938	UGMF74939	UGMF74940	UGMF74941				UGMH10909
		5/8	1-1/2	4	.461	UGMF72032		UGMF74942	UGMF74032	UGMF74943	UGMF74944	UGMF74945			UGMH10032
		5/8	2-1/4	4	.461	UGMF72905		UGMF74946	UGMF74905	UGMF74947	UGMF74948	UGMF74949			UGMH10910
1/2	1/2	5/8	3-3/8	5	.461	UGMF72923		UGMF74819	UGMF74820	UGMF74821	UGMF74822	UGMF74823			UGMH10923
		5/8	3-3/8	6	.461	UGMF72906		UGMF74950	UGMF74906	UGMF74951	UGMF74952	UGMF74953			UGMH10911
		5/8	4-1/8	6	.461	UGMF72918		UGMF74954	UGMF74955	UGMF74956	UGMF74957	UGMF74958			UGMH10912

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

NEXT PAGE ▶

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

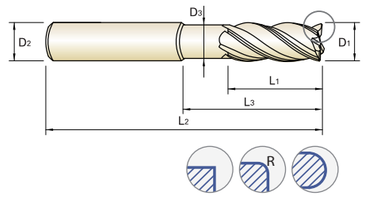
YG V7 PLUS A END MILLS

SQUARE UGMF72 SERIES
CORNER RADIUS UGMF74 SERIES
BALL NOSE UGMH10 SERIES

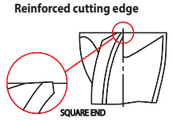
CARBIDE, 4 FLUTE EXTENDED REACH

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
▶ Advanced coating for superior performance and tool life

Square
Corner Radius
Ball Nose



Ball Nose Key on Page C602



CARBIDE | 4 | 35°/37° | R ±.0008 | PLAIN | Y Coating | p.C621, C623

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Square End	Corner Radius								Ball Nose
							.010	.015	.030	.060	.090	.125	.190	.250	
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
		3/4	1-5/8	4	.586	UGMF72040			UGMF74040	UGMF74959	UGMF74960	UGMF74961			UGMH10040
		3/4	2-3/8	5	.586	UGMF72924			UGMF74824	UGMF74825	UGMF74826	UGMF74827			UGMH10924
5/8	5/8	3/4	3-3/8	5	.586	UGMF72925			UGMF74828	UGMF74829	UGMF74830	UGMF74831			UGMH10925
		3/4	2-3/8	6	.586	UGMF72907			UGMF74907	UGMF74962	UGMF74963	UGMF74964			UGMH10913
		3/4	3-3/8	6	.586	UGMF72908			UGMF74908	UGMF74965	UGMF74966	UGMF74967			UGMH10914
		3/4	4-1/8	6	.586	UGMF72919			UGMF74968	UGMF74969	UGMF74970	UGMF74971			UGMH10915
		1	2	4	.711	UGMF72048			UGMF74048	UGMF74972	UGMF74973	UGMF74974	UGMF74975	UGMF74976	UGMH10048
		1	3	5	.711	UGMF72926			UGMF74832	UGMF74833	UGMF74834	UGMF74835	UGMF74836	UGMF74837	UGMH10926
3/4	3/4	1	2-1/2	6	.711	UGMF72920			UGMF74977	UGMF74978	UGMF74979	UGMF74980	UGMF74981	UGMF74982	UGMH10916
		1	3	6	.711	UGMF72909			UGMF74909	UGMF74983	UGMF74984	UGMF74985	UGMF74986	UGMF74987	UGMH10917
		1	4	6	.711	UGMF72910			UGMF74910	UGMF74988	UGMF74989	UGMF74990	UGMF74991	UGMF74992	UGMH10918
		1-1/8	2	4	.961	UGMF72064			UGMF74064	UGMF74993	UGMF74994	UGMF74995	UGMF74996	UGMF74997	UGMH10064
		1-1/8	2-5/8	5	.961	UGMF72927			UGMF74838	UGMF74839	UGMF74840	UGMF74841	UGMF74842	UGMF74843	UGMH10927
1	1	1-1/8	3	5	.961	UGMF72928			UGMF74844	UGMF74845	UGMF74846	UGMF74847	UGMF74848	UGMF74849	UGMH10928
		1-1/8	2-5/8	6	.961	UGMF72921			UGMF74998	UGMF74999	UGMF74801	UGMF74802	UGMF74803	UGMF74804	UGMH10919
		1-1/8	3	6	.961	UGMF72911			UGMF74911	UGMF74805	UGMF74806	UGMF74807	UGMF74808	UGMF74809	UGMH10920
		1-1/8	4	6	.961	UGMF72912			UGMF74912	UGMF74810	UGMF74811	UGMF74812	UGMF74813	UGMF74814	UGMH10921

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

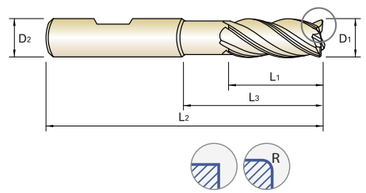
SQUARE **UGMF73 SERIES**
CORNER RADIUS **UGMF75 SERIES**

CARBIDE, 4 FLUTE EXTENDED REACH

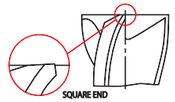
- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- Advanced coating for superior performance and tool life

Square

Corner Radius



Reinforced cutting edge



CARBIDE | 4 | 35°/37° | FLAT | Y Coating | p.C621

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Square End	Corner Radius .030
						EDP No.	EDP No.
3/8	3/8	1/2	1-1/8	4	.344	UGMF73024	UGMF75024
		1/2	2-1/8	4	.344	UGMF73903	UGMF75903
		1/2	3-1/8	5	.344	UGMF73913	UGMF75913
		1/2	3-1/8	6	.344	UGMF73904	UGMF75904
1/2	1/2	5/8	1-1/2	4	.461	UGMF73032	UGMF75032
		5/8	2-1/4	4	.461	UGMF73905	UGMF75905
		5/8	3-3/8	5	.461	UGMF73914	UGMF75914
		5/8	3-3/8	6	.461	UGMF73906	UGMF75906
5/8	5/8	3/4	1-5/8	4	.586	UGMF73040	UGMF75040
		3/4	2-3/8	5	.586	UGMF73915	UGMF75915
		3/4	3-3/8	5	.586	UGMF73916	UGMF75916
		3/4	2-3/8	6	.586	UGMF73907	UGMF75907
		3/4	3-3/8	6	.586	UGMF73908	UGMF75908
3/4	3/4	1	2	4	.711	UGMF73048	UGMF75048
		1	3	5	.711	UGMF73917	UGMF75917
		1	3	6	.711	UGMF73909	UGMF75909
		1	4	6	.711	UGMF73910	UGMF75910
1	1	1-1/8	2	4	.961	UGMF73064	UGMF75064
		1-1/8	2-5/8	5	.961	UGMF73918	UGMF75918
		1-1/8	3	5	.961	UGMF73919	UGMF75919
		1-1/8	3	6	.961	UGMF73911	UGMF75911
		1-1/8	4	6	.961	UGMF73912	UGMF75912

▶ Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

Mill Dia. Tolerance (inch)	Shank Dia.Tolerance
0 ~ -.0012	h5 (≥ Ø1/2" : h6)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

CHAMFER **GMF52 / GMF56 SERIES**
CORNER RADIUS **GMF54 / GMF58 SERIES**
BALL NOSE **GMG55 SERIES**

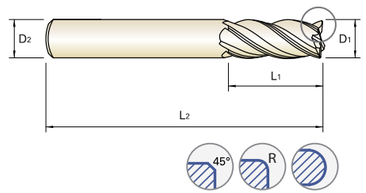
CARBIDE, 4 FLUTE MULTIPLE LENGTH

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- Advanced coating for superior performance and tool life

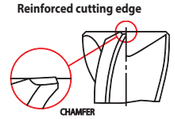
Chamfer

Corner Radius

Ball Nose



Reinforced cutting edge



CARBIDE | 4 | 35°/37° | R ±0.02 mm | PLAIN | C x 45° | Y Coating | p.C626, C628

Unit : mm

OD (D_1) Metric	OD (D_1) Inch	SD (D_2)	LOC (L_1)	OAL (L_2)	Chamfer	Corner Radius 0.30	0.50	1.00	2.00	3.00	Ball Nose
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3.0	.1181	6	7	54	GMF52030	GMF54030	GMF54901				
		6	8	57	GMF56030	GMF58030	GMF58901				GMG55030
4.0	.1575	6	8	54	GMF52040	GMF54040	GMF54902				
		6	11	57	GMF56040	GMF58040	GMF58902				GMG55040
5.0	.1969	6	10	54	GMF52050	GMF54050	GMF54903				
		6	13	57	GMF56050	GMF58050	GMF58903				GMG55050
6.0	.2362	6	10	54	GMF52060	GMF54060	GMF54904	GMF54905			
		6	13	57	GMF56060	GMF58060	GMF58904	GMF58905			GMG55060
8.0	.3150	8	12	58	GMF52080		GMF54080	GMF54906			
		8	19	63	GMF56080		GMF58080	GMF58906			GMG55080
10.0	.3937	10	14	66	GMF52100		GMF54100	GMF54907			
		10	22	72	GMF56100		GMF58100	GMF58907			GMG55100
12.0	.4724	12	16	73	GMF52120		GMF54120	GMF54908	GMF54909		
		12	26	83	GMF56120		GMF58120	GMF58908	GMF58909		GMG55120
14.0	.5512	14	18	75	GMF52140		GMF54140				
		14	26	83	GMF56140		GMF58140				
16.0	.6299	16	22	82	GMF52160			GMF54160	GMF54912	GMF54913	
		16	32	92	GMF56160			GMF58160	GMF58912	GMF58913	GMG55160
18.0	.7087	18	24	84	GMF52180			GMF54180			
		18	32	92	GMF56180			GMF58180			
20.0	.7874	20	26	92	GMF52200			GMF54200	GMF54916	GMF54917	
		20	38	104	GMF56200			GMF58200	GMF58916	GMF58917	GMG55200
25.0	.9843	25	38	104	GMF56250			GMF58250			GMG55250

CHAMFER KEY		
Mill Diameter		Chamfer Size (mm)
Metric	Inch	
3.0	.1181	0.10
4.0	.1575	0.15
5.0	.1969	0.15
6.0	.2362	0.20
8.0	.3150	0.20
10.0	.3937	0.30
12.0	.4724	0.35
14.0	.5512	0.40
16.0	.6299	0.40
18.0	.7087	0.50
20.0	.7874	0.50
25.0	.9843	0.50

BALL NOSE KEY		
Mill Diameter		Radius of Ball
Metric	Inch	
3.0	.1181	1.5
4.0	.1575	2.0
5.0	.1969	2.5
6.0	.2362	3.0
8.0	.3150	4.0
10.0	.3937	5.0
12.0	.4724	6.0
16.0	.6299	8.0
20.0	.7874	10.0
25.0	.9843	12.5

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02	h5 (≥ Ø12 : h6)
Over Ø12	0 ~ -0.03	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

YG V7 PLUS A END MILLS

CHAMFER **GMF53 / GMF57 SERIES**
CORNER RADIUS **GMF55 / GMF59 SERIES**
BALL NOSE **GMG56 SERIES**

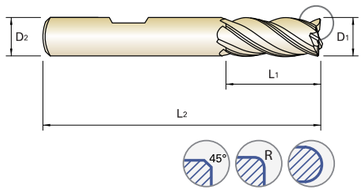
CARBIDE, 4 FLUTE MULTIPLE LENGTH

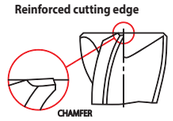
▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
▶ Advanced coating for superior performance and tool life

Chamfer

Corner Radius

Ball Nose





CARBIDE | 4 | 35°/37° | R ±0.02 mm | FLAT | C x 45° | Y Coating

p.C626, C628

Unit : mm

OD (D1) Metric	OD (D1) Inch	SD (D2)	LOC (L1)	OAL (L2)	Chamfer	Corner Radius 0.30	0.50	1.00	2.00	3.00	Ball Nose
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3.0	.1181	6	7	54	GMF53030	GMF55030	GMF55901				
		6	8	57	GMF57030	GMF59030	GMF59901				GMG56030
4.0	.1575	6	8	54	GMF53040	GMF55040	GMF55902				
		6	11	57	GMF57040	GMF59040	GMF59902				GMG56040
5.0	.1969	6	10	54	GMF53050	GMF55050	GMF55903				
		6	13	57	GMF57050	GMF59050	GMF59903				GMG56050
6.0	.2362	6	10	54	GMF53060	GMF55060	GMF55904	GMF55905			
		6	13	57	GMF57060	GMF59060	GMF59904	GMF59905			GMG56060
8.0	.3150	8	12	58	GMF53080		GMF55080	GMF55906			
		8	19	63	GMF57080		GMF59080	GMF59906			GMG56080
10.0	.3937	10	14	66	GMF53100		GMF55100	GMF55907			
		10	22	72	GMF57100		GMF59100	GMF59907			GMG56100
12.0	.4724	12	16	73	GMF53120		GMF55120	GMF55908	GMF55909		
		12	26	83	GMF57120		GMF59120	GMF59908	GMF59909		GMG56120
14.0	.5512	14	18	75	GMF53140		GMF55140				
		14	26	83	GMF57140		GMF59140				
16.0	.6299	16	22	82	GMF53160			GMF55160	GMF55912	GMF55913	
		16	32	92	GMF57160			GMF59160	GMF59912	GMF59913	GMG56160
18.0	.7087	18	24	84	GMF53180			GMF55180			
		18	32	92	GMF57180			GMF59180			
20.0	.7874	20	26	92	GMF53200			GMF55200	GMF55916	GMF55917	
		20	38	104	GMF57200			GMF59200	GMF59916	GMF59917	GMG56200
25.0	.9843	25	38	104	GMF57250			GMF59250			GMG56250

CHAMFER KEY

Mill Diameter Metric	Mill Diameter Inch	Chamfer Size (mm)
3.0	.1181	0.10
4.0	.1575	0.15
5.0	.1969	0.15
6.0	.2362	0.20
8.0	.3150	0.20
10.0	.3937	0.30
12.0	.4724	0.35
14.0	.5512	0.40
16.0	.6299	0.40
18.0	.7087	0.50
20.0	.7874	0.50
25.0	.9843	0.50

BALL NOSE KEY

Mill Diameter Metric	Mill Diameter Inch	Radius of Ball
3.0	.1181	1.5
4.0	.1575	2.0
5.0	.1969	2.5
6.0	.2362	3.0
8.0	.3150	4.0
10.0	.3937	5.0
12.0	.4724	6.0
16.0	.6299	8.0
20.0	.7874	10.0
25.0	.9843	12.5

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02	h5 (≥ Ø12 : h6)
Over Ø12	0 ~ -0.03	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

YG V7 PLUS A END MILLS

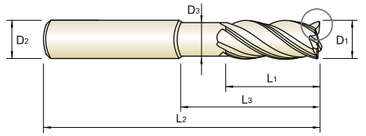
CHAMFER **GMF60 SERIES**
CORNER RADIUS **GMF62 SERIES**

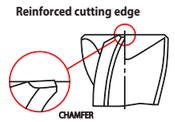
CARBIDE, 4 FLUTE EXTENDED REACH

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
▶ Advanced coating for superior performance and tool life

Chamfer

Corner Radius





CARBIDE | 4 | 35°/37° | PLAIN | C x 45° | Y Coating

p.C626

Unit : mm

OD (D1) Metric	OD (D1) Inch	SD (D2)	LOC (L1)	LBS (L3)	OAL (L2)	Neck Dia (D3)	Chamfer	Corner Radius 0.30	0.50	1.00	2.00	3.00
							EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3.0	.1181	6	7	12	54	2.7	GMF60030	GMF62030	GMF62901			
		6	7	17	57	2.7	GMF60901	GMF62902	GMF62903			
		6	8	14	57	2.7	GMF60902					
4.0	.1575	6	8	15	57	3.7	GMF60040	GMF62040	GMF62904			
		6	8	22	63	3.7	GMF60903	GMF62905	GMF62906			
		6	11	16	57	3.7	GMF60904					
5.0	.1969	6	10	17	57	4.7	GMF60050	GMF62050	GMF62907			
		6	10	27	67	4.7	GMF60905	GMF62908	GMF62909			
		6	13	18	57	4.7	GMF60906					
6.0	.2362	6	10	15	57	5.5	GMF60060	GMF62060	GMF62910	GMF62911		
		6	10	20	62	5.5	GMF60907	GMF62912	GMF62913	GMF62914		
		6	10	32	74	5.5	GMF60908	GMF62915	GMF62916	GMF62917		
		6	13	21	57	5.5	GMF60909					
8.0	.3150	8	12	20	63	7.5	GMF60080		GMF62080	GMF62918		
		8	12	30	73	7.5	GMF60910		GMF62919	GMF62920		
		8	12	46	90	7.5	GMF60911		GMF62921	GMF62922		
		8	19	27	63	7.5	GMF60912					
10.0	.3937	10	14	25	72	9.2	GMF60100		GMF62100	GMF62923		
		10	14	35	82	9.2	GMF60913		GMF62924	GMF62925		
		10	14	55	102	9.2	GMF60914		GMF62926	GMF62927		
		10	22	32	72	9.2	GMF60915					
12.0	.4724	12	16	30	83	11.0	GMF60120		GMF62120	GMF62928	GMF62929	
		12	16	40	93	11.0	GMF60916		GMF62930	GMF62931	GMF62932	
		12	16	64	117	11.0	GMF60917		GMF62933	GMF62934	GMF62935	
		12	26	38	83	11.0	GMF60918					
16.0	.6299	16	22	38	92	15.0	GMF60160			GMF62160	GMF62936	GMF62937
		16	22	55	109	15.0	GMF60919			GMF62938	GMF62939	GMF62940
		16	22	87	141	15.0	GMF60920			GMF62941	GMF62942	GMF62943
		16	32	44	92	15.0	GMF60921					
20.0	.7874	20	26	50	104	19.0	GMF60200			GMF62200	GMF62944	GMF62945
		20	26	70	124	19.0	GMF60922			GMF62946	GMF62947	GMF62948
		20	26	110	164	19.0	GMF60923			GMF62949	GMF62950	GMF62951
		20	38	54	104	19.0	GMF60924					

CHAMFER KEY

Mill Diameter Metric	Mill Diameter Inch	Chamfer Size (mm)
3.0	.1181	0.10
4.0	.1575	0.15
5.0	.1969	0.15
6.0	.2362	0.20
8.0	.3150	0.20
10.0	.3937	0.30
12.0	.4724	0.35
16.0	.6299	0.40
20.0	.7874	0.50

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02	h5 (≥ Ø12 : h6)
Over Ø12	0 ~ -0.03	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

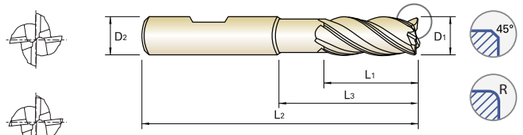
CHAMFER **GMF61** SERIES
CORNER RADIUS **GMF63** SERIES

CARBIDE, 4 FLUTE EXTENDED REACH

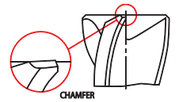
▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
▶ Advanced coating for superior performance and tool life

Chamfer

Corner Radius



Reinforced cutting edge



CARBIDE | 4 | 35°/37° | FLAT | C x 45° | Y Coating

p.C626

Unit : mm

OD (D_1)		SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Chamfer	Corner Radius				
								0.30	0.50	1.00	2.00	3.00
Metric	Inch						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3.0	.1181	6	7	12	54	2.7	GMF61030	GMF63030	GMF63901			
		6	7	17	57	2.7	GMF61901	GMF63902	GMF63903			
		6	8	14	57	2.7	GMF61902					
4.0	.1575	6	8	15	57	3.7	GMF61040	GMF63040	GMF63904			
		6	8	22	63	3.7	GMF61903	GMF63905	GMF63906			
		6	11	16	57	3.7	GMF61904					
5.0	.1969	6	10	17	57	4.7	GMF61050	GMF63050	GMF63907			
		6	10	27	67	4.7	GMF61905	GMF63908	GMF63909			
		6	13	18	57	4.7	GMF61906					
6.0	.2362	6	10	15	57	5.5	GMF61060	GMF63060	GMF63910	GMF63911		
		6	10	20	62	5.5	GMF61907	GMF63912	GMF63913	GMF63914		
		6	10	32	74	5.5	GMF61908	GMF63915	GMF63916	GMF63917		
		6	13	21	57	5.5	GMF61909					
8.0	.3150	8	12	20	63	7.5	GMF61080		GMF63080	GMF63918		
		8	12	30	73	7.5	GMF61910		GMF63919	GMF63920		
		8	12	46	90	7.5	GMF61911		GMF63921	GMF63922		
		8	19	27	63	7.5	GMF61912					
10.0	.3937	10	14	25	72	9.2	GMF61100		GMF63100	GMF63923		
		10	14	35	82	9.2	GMF61913		GMF63924	GMF63925		
		10	14	55	102	9.2	GMF61914		GMF63926	GMF63927		
		10	22	32	72	9.2	GMF61915					
12.0	.4724	12	16	30	83	11.0	GMF61120		GMF63120	GMF63928	GMF63929	
		12	16	40	93	11.0	GMF61916		GMF63930	GMF63931	GMF63932	
		12	16	64	117	11.0	GMF61917		GMF63933	GMF63934	GMF63935	
		12	26	38	83	11.0	GMF61918					
16.0	.6299	16	22	38	92	15.0	GMF61160			GMF63160	GMF63936	GMF63937
		16	22	55	109	15.0	GMF61919			GMF63938	GMF63939	GMF63940
		16	22	87	141	15.0	GMF61920			GMF63941	GMF63942	GMF63943
		16	32	44	92	15.0	GMF61921					
20.0	.7874	20	26	50	104	19.0	GMF61200			GMF63200	GMF63944	GMF63945
		20	26	70	124	19.0	GMF61922			GMF63946	GMF63947	GMF63948
		20	26	110	164	19.0	GMF61923			GMF63949	GMF63950	GMF63951
		20	38	54	104	19.0	GMF61924					

CHAMFER KEY		
Mill Diameter		Chamfer Size (mm)
Metric	Inch	
3.0	.1181	0.10
4.0	.1575	0.15
5.0	.1969	0.15
6.0	.2362	0.20
8.0	.3150	0.20
10.0	.3937	0.30
12.0	.4724	0.35
16.0	.6299	0.40
20.0	.7874	0.50

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02	h5 (≥ Ø12 : h6)
Over Ø12	0 ~ -0.03	

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

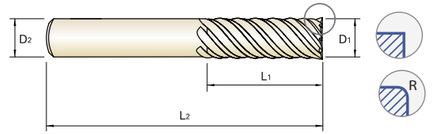
SQUARE **UGMG20** SERIES
CORNER RADIUS **UGMG22** SERIES

CARBIDE, 6 FLUTE MULTIPLE LENGTH

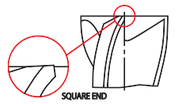
▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

Square

Corner Radius



Reinforced cutting edge



CARBIDE | 6 | 45° | PLAIN | Y Coating

p.C624

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius							
					.015	.030	.060	.090	.120	.125	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/4	1/4	1/2	2-1/2	UGMG20914	UGMG22956	UGMG22957	UGMG22958					
		3/4	2-1/2	UGMG20016	UGMG22016	UGMG22959	UGMG22960					
		1-1/8	3	UGMG20901	UGMG22901	UGMG22902	UGMG22961					
		1-1/2	4	UGMG20902	UGMG22903	UGMG22904	UGMG22962					
5/16	5/16	3/4	2-1/2	UGMG20020	UGMG22020							
		1-1/4	3	UGMG20903	UGMG22905	UGMG22906						
		1-5/8	4	UGMG20904	UGMG22907	UGMG22908						
3/8	3/8	5/8	2-1/2	UGMG20915	UGMG22963	UGMG22964	UGMG22965	UGMG22966				
		1	3	UGMG20024	UGMG22024	UGMG22909	UGMG22910	UGMG22967				
		1-1/2	4	UGMG20905	UGMG22911	UGMG22912	UGMG22913	UGMG22968				
		2	4	UGMG20906	UGMG22914	UGMG22915	UGMG22916	UGMG22969				
1/2	1/2	5/8	3	UGMG20916	UGMG22970	UGMG22971	UGMG22972	UGMG22973		UGMG22974		
		1	3	UGMG20917	UGMG22032	UGMG22917	UGMG22918	UGMG22975		UGMG22976		
		1	3-1/4	UGMG20032								
		1-1/4	3	UGMG20930	UGMG22880	UGMG22881	UGMG22882	UGMG22883	UGMG22884	UGMG22885		
		1-1/4	3-1/2	UGMG20907	UGMG22977	UGMG22919	UGMG22920	UGMG22921	UGMG22922	UGMG22978		
		1-5/8	4	UGMG20918	UGMG22979	UGMG22980	UGMG22981	UGMG22982		UGMG22983		
		2	4	UGMG20908	UGMG22984	UGMG22923	UGMG22924	UGMG22925	UGMG22926	UGMG22985		
		2-5/8	5	UGMG20919	UGMG22986	UGMG22987	UGMG22988	UGMG22989		UGMG22990		
		3	5	UGMG20909	UGMG22991	UGMG22927	UGMG22928	UGMG22929	UGMG22930	UGMG22992		

NEXT PAGE ▶

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35		15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325		200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		◎	◎	◎	◎	◎	◎	◎	◎	◎

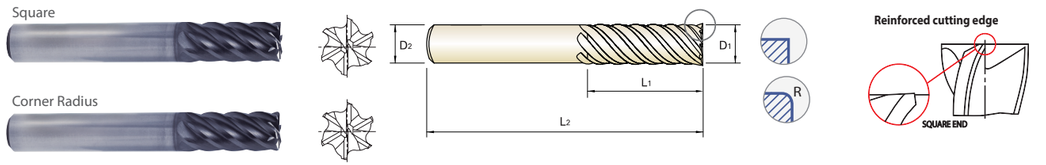
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

SQUARE **UGMG20** SERIES
CORNER RADIUS **UGMG22** SERIES

CARBIDE, 6 FLUTE MULTIPLE LENGTH

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



CARBIDE | 6 | 45° | PLAIN | Y Coating | p.C624

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius							
					.015	.030	.060	.090	.120	.125	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
5/8	5/8	3/4	3	UGMG20920	UGMG22993	UGMG22994	UGMG22995	UGMG22996		UGMG22997		
		1-1/4	3-1/2	UGMG20040	UGMG22998	UGMG22040	UGMG22931	UGMG22932	UGMG22933	UGMG22999		
		1-7/8	4	UGMG20921	UGMG22801	UGMG22802	UGMG22803	UGMG22804		UGMG22805		
		2	4	UGMG20910	UGMG22806	UGMG22934	UGMG22935	UGMG22936	UGMG22937	UGMG22807		
		2-5/8	5	UGMG20922	UGMG22808	UGMG22809	UGMG22810	UGMG22811		UGMG22812		
		3	5	UGMG20911	UGMG22813	UGMG22938	UGMG22939	UGMG22940	UGMG22941	UGMG22814		
3/4	3/4	1	3-1/2	UGMG20923	UGMG22815	UGMG22816	UGMG22817	UGMG22818		UGMG22819	UGMG22820	UGMG22821
		1-1/2	4	UGMG20048	UGMG22822	UGMG22048	UGMG22942	UGMG22943	UGMG22944	UGMG22823	UGMG22824	UGMG22825
		1-7/8	5	UGMG20924	UGMG22826	UGMG22827	UGMG22828	UGMG22829		UGMG22830	UGMG22831	UGMG22832
		2-1/4	5	UGMG20925	UGMG22833	UGMG22834	UGMG22835	UGMG22836		UGMG22837	UGMG22838	UGMG22839
		2-3/4	5	UGMG20926	UGMG22840	UGMG22841	UGMG22842	UGMG22843		UGMG22844	UGMG22845	UGMG22846
		3	5-1/2	UGMG20912	UGMG22847	UGMG22945	UGMG22946	UGMG22947	UGMG22948	UGMG22848	UGMG22849	UGMG22850
1	1	1-1/2	4	UGMG20064	UGMG22851	UGMG22064	UGMG22949	UGMG22950	UGMG22951	UGMG22852	UGMG22853	UGMG22854
		2	5	UGMG20927	UGMG22855	UGMG22856	UGMG22857	UGMG22858		UGMG22859	UGMG22860	UGMG22861
		2-5/8	5	UGMG20928	UGMG22862	UGMG22863	UGMG22864	UGMG22865		UGMG22866	UGMG22867	UGMG22868
		3-1/4	6	UGMG20929	UGMG22869	UGMG22870	UGMG22871	UGMG22872		UGMG22873	UGMG22874	UGMG22875
		4	7	UGMG20913	UGMG22876	UGMG22952	UGMG22953	UGMG22954	UGMG22955	UGMG22877	UGMG22878	UGMG22879

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

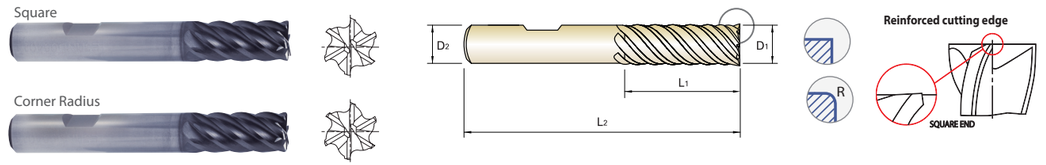
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

SQUARE **UGMG21** SERIES
CORNER RADIUS **UGMG23** SERIES

CARBIDE, 6 FLUTE MULTIPLE LENGTH

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



CARBIDE | 6 | 45° | FLAT | Y Coating | p.C624

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius				
					.015	.030	.060	.090	.120
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	1	3	UGMG21024	UGMG23024	UGMG23909	UGMG23910		
		1-1/2	4	UGMG21905	UGMG23911	UGMG23912	UGMG23913		
		2	4	UGMG21906	UGMG23914	UGMG23915	UGMG23916		
1/2	1/2	1	3	UGMG21914	UGMG23032	UGMG23917	UGMG23918		
		1	3-1/4	UGMG21032					
		1-1/4	3	UGMG21915	UGMG23956	UGMG23957	UGMG23958	UGMG23959	UGMG23960
		1-1/4	3-1/2	UGMG21907		UGMG23919	UGMG23920	UGMG23921	UGMG23922
		2	4	UGMG21908		UGMG23923	UGMG23924	UGMG23925	UGMG23926
		3	5	UGMG21909		UGMG23927	UGMG23928	UGMG23929	UGMG23930
5/8	5/8	1-1/4	3-1/2	UGMG21040		UGMG23040	UGMG23931	UGMG23932	UGMG23933
		2	4	UGMG21910		UGMG23934	UGMG23935	UGMG23936	UGMG23937
		3	5	UGMG21911		UGMG23938	UGMG23939	UGMG23940	UGMG23941
3/4	3/4	1-1/2	4	UGMG21048		UGMG23048	UGMG23942	UGMG23943	UGMG23944
		3	5-1/2	UGMG21912		UGMG23945	UGMG23946	UGMG23947	UGMG23948
1	1	1-1/2	4	UGMG21064		UGMG23064	UGMG23949	UGMG23950	UGMG23951
		4	7	UGMG21913		UGMG23952	UGMG23953	UGMG23954	UGMG23955

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

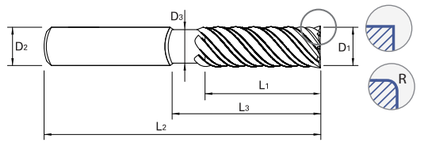
SQUARE **UGMH08 SERIES**
CORNER RADIUS **UGMH09 SERIES**

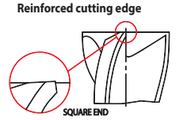
CARBIDE, 6 FLUTE EXTENDED REACH

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

Square

Corner Radius





CARBIDE | 6 | 45° | PLAIN | Y Coating | p.C624

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Square End	Corner Radius					
							.030	.060	.090	.125	.190	.250
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/4	1/4	3/8	3/4	4	.230	UGMH08016	UGMH09016	UGMH09901				
		3/8	1-1/8	4	.230	UGMH08901	UGMH09902	UGMH09903				
		3/8	2-1/8	4	.230	UGMH08902	UGMH09904	UGMH09905				
3/8	3/8	1/2	1-1/8	4	.344	UGMH08024	UGMH09024	UGMH09906	UGMH09907			
		1/2	2-1/8	4	.344	UGMH08903	UGMH09908	UGMH09909	UGMH09910			
		1/2	3-1/8	5	.344	UGMH08919	UGMH09999	UGMH09801	UGMH09802			
		1/2	3-1/8	6	.344	UGMH08904	UGMH09911	UGMH09912	UGMH09913			
		1/2	4-1/8	6	.344	UGMH08905	UGMH09914	UGMH09915	UGMH09916			
1/2	1/2	5/8	1-1/2	4	.461	UGMH08032	UGMH09032	UGMH09917	UGMH09918	UGMH09919		
		5/8	2-1/4	4	.461	UGMH08906	UGMH09920	UGMH09921	UGMH09922	UGMH09923		
		5/8	3-3/8	5	.461	UGMH08920	UGMH09803	UGMH09804	UGMH09805	UGMH09806		
		5/8	3-3/8	6	.461	UGMH08907	UGMH09924	UGMH09925	UGMH09926	UGMH09927		
		5/8	4-1/8	6	.461	UGMH08908	UGMH09928	UGMH09929	UGMH09930	UGMH09931		
5/8	5/8	3/4	1-5/8	4	.586	UGMH08040	UGMH09040	UGMH09932	UGMH09933	UGMH09934		
		3/4	2-3/8	5	.586	UGMH08921	UGMH09807	UGMH09808	UGMH09809	UGMH09810		
		3/4	3-3/8	5	.586	UGMH08922	UGMH09811	UGMH09812	UGMH09813	UGMH09814		
		3/4	2-3/8	6	.586	UGMH08909	UGMH09935	UGMH09936	UGMH09937	UGMH09938		
		3/4	3-3/8	6	.586	UGMH08910	UGMH09939	UGMH09940	UGMH09941	UGMH09942		
		3/4	4-1/8	6	.586	UGMH08911	UGMH09943	UGMH09944	UGMH09945	UGMH09946		

NEXT PAGE ▶

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

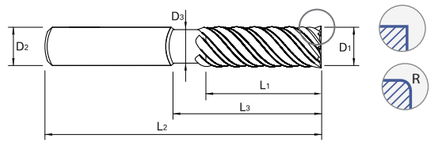
SQUARE UGMH08 SERIES
CORNER RADIUS UGMH09 SERIES

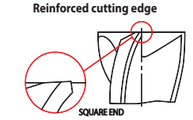
CARBIDE, 6 FLUTE EXTENDED REACH

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40

Square

Corner Radius





CARBIDE | 6 | 45° | PLAIN | Y Coating | p.C624

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia (D_3)	Square End	Corner Radius					
							.030	.060	.090	.125	.190	.250
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
3/4	3/4	1-1/8	2	4	.711	UGMH08048	UGMH09048	UGMH09947	UGMH09948	UGMH09949	UGMH09950	UGMH09951
		1-1/8	2-5/8	5	.711	UGMH08912	UGMH09952	UGMH09953	UGMH09954	UGMH09955	UGMH09956	UGMH09957
		1-1/8	3-1/4	6	.711	UGMH08913	UGMH09958	UGMH09959	UGMH09960	UGMH09961	UGMH09962	UGMH09963
		1-1/8	4-1/4	7	.711	UGMH08914	UGMH09964	UGMH09965	UGMH09966	UGMH09967	UGMH09968	UGMH09969
1	1	1-1/4	2-1/4	4	.961	UGMH08064	UGMH09064	UGMH09970	UGMH09971	UGMH09972	UGMH09973	UGMH09974
		1-1/4	2-5/8	5	.961	UGMH08915	UGMH09975	UGMH09976	UGMH09977	UGMH09978	UGMH09979	UGMH09980
		1-1/4	3-1/4	6	.961	UGMH08916	UGMH09981	UGMH09982	UGMH09983	UGMH09984	UGMH09985	UGMH09986
		1-1/4	4-1/4	7	.961	UGMH08917	UGMH09987	UGMH09988	UGMH09989	UGMH09990	UGMH09991	UGMH09992
		1-1/4	5-1/4	8	.961	UGMH08918	UGMH09993	UGMH09994	UGMH09995	UGMH09996	UGMH09997	UGMH09998

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

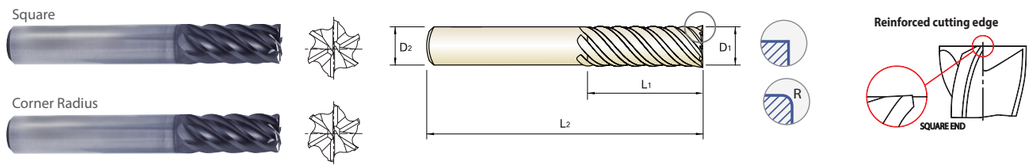
ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

SQUARE **GMG12 / GMG14 SERIES**
CORNER RADIUS **GMG16 / GMG18 SERIES**

CARBIDE, 6 FLUTE MULTIPLE LENGTH

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



CARBIDE | 6 | 45° | PLAIN | Y Coating | p.C629

Unit : mm

OD (D_1)		SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius						
						0.50	1.00	1.50	2.00	3.00	4.00	5.00
Metric	Inch				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6.0	.2362	6	13	57	GMG12060	GMG16060	GMG16901					
		6	24	75	GMG14060	GMG18060	GMG18901					
8.0	.3150	8	19	63	GMG12080	GMG16080	GMG16902					
		8	32	75	GMG14080	GMG18080	GMG18902		GMG18903			
10.0	.3937	10	22	72	GMG12100	GMG16100	GMG16903	GMG16904	GMG16905			
		10	40	100	GMG14100	GMG18100	GMG18904	GMG18905	GMG18906			
12.0	.4724	12	26	83	GMG12120	GMG16120	GMG16906	GMG16907	GMG16908	GMG16909		
		12	48	120	GMG14120	GMG18120	GMG18907	GMG18908	GMG18909	GMG18910		
16.0	.6299	16	32	92	GMG12160		GMG16160	GMG16910	GMG16911	GMG16912		
		16	64	140	GMG14160		GMG18160	GMG18911	GMG18912	GMG18913		
20.0	.7874	20	38	104	GMG12200		GMG16200	GMG16913	GMG16914	GMG16915		
		20	80	150	GMG14200		GMG18200	GMG18914	GMG18915	GMG18916	GMG18917	GMG18918
25.0	.9843	25	44	104	GMG12250		GMG16250	GMG16916	GMG16917	GMG16918		
		25	100	170	GMG14250		GMG18250	GMG18919	GMG18920	GMG18921	GMG18922	GMG18923

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to 3xD		Over 3xD	
Up to Ø12	0 ~ -0.02	0 ~ -0.03	h5 (≥ Ø12 : h6)
Over Ø12	0 ~ -0.03		

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

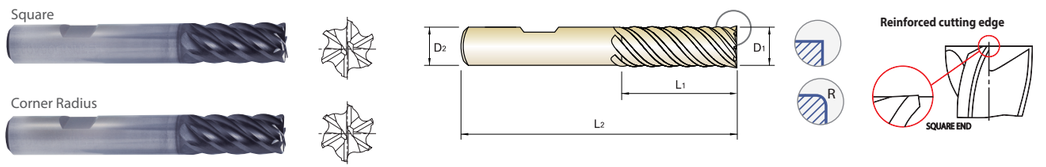
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

SQUARE **GMG13 / GMG15 SERIES**
CORNER RADIUS **GMG17 / GMG19 SERIES**

CARBIDE, 6 FLUTE MULTIPLE LENGTH

▶The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
▶Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



CARBIDE | 6 | 45° | FLAT | Y Coating | p.C629

Unit : mm

OD (D_1)		SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius						
						0.50	1.00	1.50	2.00	3.00	4.00	5.00
Metric	Inch				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6.0	.2362	6	13	57	GMG13060	GMG17060	GMG17901					
		6	24	75	GMG15060	GMG19060	GMG19901					
8.0	.3150	8	19	63	GMG13080	GMG17080	GMG17902					
		8	32	75	GMG15080	GMG19080	GMG19902		GMG19903			
10.0	.3937	10	22	72	GMG13100	GMG17100	GMG17903	GMG17904	GMG17905			
		10	40	100	GMG15100	GMG19100	GMG19904	GMG19905	GMG19906			
12.0	.4724	12	26	83	GMG13120	GMG17120	GMG17906	GMG17907	GMG17908	GMG17909		
		12	48	120	GMG15120	GMG19120	GMG19907	GMG19908	GMG19909	GMG19910		
16.0	.6299	16	32	92	GMG13160		GMG17160	GMG17910	GMG17911	GMG17912		
		16	64	140	GMG15160		GMG19160	GMG19911	GMG19912	GMG19913		
20.0	.7874	20	38	104	GMG13200		GMG17200	GMG17913	GMG17914	GMG17915		
		20	80	150	GMG15200		GMG19200	GMG19914	GMG19915	GMG19916	GMG19917	GMG19918
25.0	.9843	25	44	104	GMG13250		GMG17250	GMG17916	GMG17917	GMG17918		
		25	100	170	GMG15250		GMG19250	GMG19919	GMG19920	GMG19921	GMG19922	GMG19923

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to 3xD		Over 3xD	
Up to Ø12	0 ~ -0.02	0 ~ -0.03	h5 (≥ Ø12 : h6)
Over Ø12	0 ~ -0.03		

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

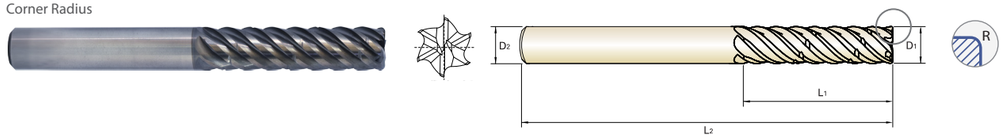
V7 PLUS A END MILLS

CORNER RADIUS **GMH72 SERIES**

CARBIDE, 6 FLUTE CHIP SPLITTER

▶Special chip splitter design for better chip removal shortened chip length at high axial machining
▶High Performance for Steels, Stainless Steels and Cast Iron

Corner Radius



CARBIDE | 6 | 45° | PLAIN | Y Coating

p.C625

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Corner Radius .015	.030	.060	.125
				EDP No.	EDP No.	EDP No.	EDP No.
3/8	3/8	5/8	2-1/2	GMH72901	GMH72902		
3/8	3/8	1	2-1/2	GMH72903			
3/8	3/8	1-1/8	3	GMH72024	GMH72904		
1/2	1/2	1-1/4	3		GMH72905	GMH72906	
1/2	1/2	1-1/2	3-1/2		GMH72907	GMH72908	
1/2	1/2	1-5/8	4	GMH72032	GMH72909	GMH72910	
1/2	1/2	2	4		GMH72911	GMH72912	
5/8	5/8	1-1/4	3-1/2		GMH72913	GMH72914	
5/8	5/8	1-7/8	4		GMH72915	GMH72916	
5/8	5/8	2	4	GMH72040	GMH72917	GMH72918	GMH72919
5/8	5/8	2-3/16	4-1/2		GMH72920	GMH72921	
5/8	5/8	2-5/8	5		GMH72922	GMH72923	
3/4	3/4	1-1/2	4		GMH72924	GMH72925	GMH72926
3/4	3/4	1-7/8	4-1/2		GMH72927	GMH72928	
3/4	3/4	2-1/4	5	GMH72048	GMH72929	GMH72930	GMH72931
3/4	3/4	2-3/4	5		GMH72932	GMH72933	GMH72934
3/4	3/4	3	6		GMH72935	GMH72936	
1	1	2	5		GMH72937	GMH72938	GMH72939
1	1	2-1/2	5-1/2		GMH72942	GMH72943	
1	1	3-1/4	6	GMH72064	GMH72944	GMH72945	GMH72946
1	1	3-1/2	6-1/2		GMH72940	GMH72941	
1	1	4	7			GMH72947	

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-.0012	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P																				M						K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel										Stainless steel						Grey cast iron				Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20												
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21												
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230												
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎												

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

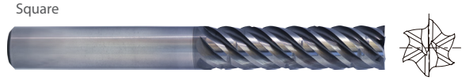
V7 PLUS A END MILLS

SQUARE **GMH56 SERIES**
CORNER RADIUS **GMH58 SERIES**

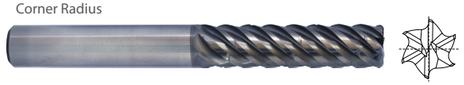
CARBIDE, 6 FLUTE CHIP SPLITTER

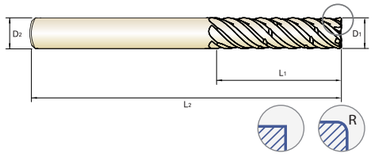
▶Special chip splitter design for better chip removal shortened chip length at high axial machining
▶High Performance for Steels, Stainless Steels and Cast Iron

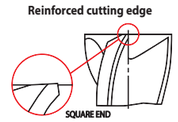
Square



Corner Radius







CARBIDE | 6 | 45° | PLAIN | Y Coating

p.C630

Unit : mm

OD (D_1) Metric	OD (D_1) Inch	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius 0.50	1.00	1.50	2.00	3.00	4.00	5.00
					EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6.0	.2363	6	24	75	GMH56060	GMH58060	GMH58901					
8.0	.3150	8	32	75	GMH56080	GMH58080	GMH58902		GMH58903			
10.0	.3937	10	40	100	GMH56100	GMH58100	GMH58904	GMH58905	GMH58906			
12.0	.4724	12	48	120	GMH56120	GMH58120	GMH58907	GMH58908	GMH58909	GMH58910		
16.0	.6299	16	64	140	GMH56160		GMH58160	GMH58911	GMH58912	GMH58913		
20.0	.7874	20	80	150	GMH56200		GMH58200	GMH58914	GMH58915	GMH58916	GMH58917	GMH58918
25.0	.9843	25	100	170	GMH56250		GMH58250	GMH58919	GMH58920	GMH58921	GMH58922	GMH58923

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.03	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P																				M						K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel										Stainless steel						Grey cast iron				Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20												
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21												
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230												
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎												

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

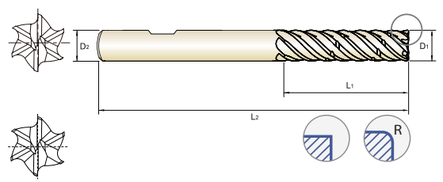
SQUARE **GMH57** SERIES
CORNER RADIUS **GMH59** SERIES

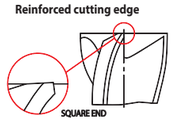
CARBIDE, 6 FLUTE CHIP SPLITTER

▶Special chip splitter design for better chip removal shortened chip length at high axial machining
▶High Performance for Steels, Stainless Steels and Cast Iron

Square

Corner Radius





CARBIDE | 6 | 45° | FLAT | Y Coating

p.C630

Unit : mm

OD (D_1)		SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius						
						0.50	1.00	1.50	2.00	3.00	4.00	5.00
Metric	Inch				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
6.0	.2363	6	24	75	GMH57060	GMH59060	GMH59901					
8.0	.3150	8	32	75	GMH57080	GMH59080	GMH59902		GMH59903			
10.0	.3937	10	40	100	GMH57100	GMH59100	GMH59904	GMH59905	GMH59906			
12.0	.4724	12	48	120	GMH57120	GMH59120	GMH59907	GMH59908	GMH59909	GMH59910		
16.0	.6299	16	64	140	GMH57160		GMH59160	GMH59911	GMH59912	GMH59913		
20.0	.7874	20	80	150	GMH57200		GMH59200	GMH59914	GMH59915	GMH59916	GMH59917	GMH59918
25.0	.9843	25	100	170	GMH57250		GMH59250	GMH59919	GMH59920	GMH59921	GMH59922	GMH59923

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.03	h5 (≥ Ø12 : h6)

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

V7 PLUS A END MILLS

RECOMMENDED CUTTING CONDITIONS

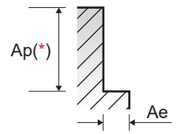
UGMF68, UGMF69, UGMF70, UGMF71, UGMF72 UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES

4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)													
						1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	500	500	500	500	500	500	500	525	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110
					IPM(FEED)	12	15	18	19	19	23	26	30	34	32	31	28	29	21
	5	Low alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470
					IPM(FEED)	8	11	12	13	14	16	18	21	23	22	22	20	20	15
	6-7		0.5D	1.5D (1.2D)	SFM(Vc)	500	500	500	500	500	500	500	525	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110
					IPM(FEED)	12	15	18	19	19	23	26	30	34	32	31	28	29	21
	8-9		0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470
					IPM(FEED)	8	11	12	13	14	16	18	21	23	22	22	20	20	15
	10-11.1	High alloyed steel, and tool steel	0.5D	1.5D (1.2D)	SFM(Vc)	210	210	210	210	210	210	210	220	230	230	230	230	230	230
					IPT(fz)	.0001	.0002	.0003	.0004	.0004	.0006	.0007	.0009	.0011	.0012	.0013	.0015	.0018	.0018
					RPM	6420	5130	4280	3670	3210	2850	2570	2450	2340	2010	1760	1410	1170	880
					IPM(FEED)	3	5	5	5	6	7	8	9	10	9	9	8	8	6
M	12-13	Stainless steel	0.5D	1.5D (1.2D)	SFM(Vc)	500	500	500	500	500	500	500	525	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110
					IPM(FEED)	12	15	18	19	19	23	26	30	34	32	31	28	29	21
	14.1		0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470
					IPM(FEED)	8	11	12	13	14	16	18	21	23	22	22	20	20	15
	14.2		0.5D	1.5D (1.2D)	SFM(Vc)	310	310	310	310	310	310	310	310	310	310	310	310	310	310
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0020	.0022	.0024	.0030	.0030
					RPM	9540	7630	6360	5450	4770	4240	3810	3470	3180	2720	2380	1910	1590	1190
					IPM(FEED)	8	10	13	13	14	15	17	21	24	22	21	19	19	14
K	15-20	Grey cast iron	0.5D	1.5D (1.2D)	SFM(Vc)	365	365	365	365	365	365	365	385	405	405	405	405	405	405
					IPT(fz)	.0002	.0004	.0006	.0007	.0008	.0011	.0013	.0016	.0019	.0021	.0023	.0026	.0032	.0031
					RPM	11220	8970	7480	6410	5610	4990	4490	4290	4120	3530	3090	2470	2060	1540
					IPM(FEED)	11	14	16	17	18	21	24	28	31	29	28	25	26	19
S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	85	85	85
					IPT(fz)	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0010	.0013	.0014	.0015	.0017	.0021	.0020
					RPM	2600	2080	1730	1480	1300	1150	1040	950	870	740	650	520	430	330
					IPM(FEED)	2	2	2	2	2	3	3	4	5	4	4	4	4	3
	36-37	Titanium Alloys	0.35D	1.0D	SFM(Vc)	190	190	190	190	190	190	190	190	190	190	190	190	190	190
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0017	.0018	.0020	.0022	.0027	.0027
					RPM	5810	4650	3870	3320	2900	2580	2320	2110	1940	1660	1450	1160	970	730
					IPM(FEED)	4	5	7	7	7	8	9	11	13	12	11	10	10	8

*( ) : Short length & Neck type



NOTES:
- Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
- The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
- In profile operations, engaging more that 2xD, reduce the radial depth of cut by 50%-60%
- Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1

V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

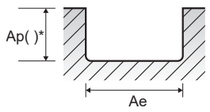
UGMF68, UGMF69, UGMF70, UGMF71, UGMF72 UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES

4 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	500	500	525	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110
					IPM(FEED)	12	15	18	19	19	23	26	30	34	32	31	28	29	21
	5	Low alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470
					IPM(FEED)	8	11	12	13	14	16	18	21	23	22	22	20	20	15
	6-7		1.0D	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	500	500	525	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0019	.0021	.0026	.0025
					RPM	15250	12200	10170	8710	7630	6780	6100	5830	5620	4810	4210	3370	2810	2110
					IPM(FEED)	12	15	18	19	19	23	26	30	34	32	31	28	29	21
	8-9		1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470
					IPM(FEED)	8	11	12	13	14	16	18	21	23	22	22	20	20	15
	10-11.1	High alloyed steel, and tool steel	1.0D	1.0D (0.8D)	SFM(Vc)	210	210	210	210	210	210	210	220	230	230	230	230	230	230
					IPT(fz)	.0001	.0002	.0003	.0004	.0004	.0006	.0007	.0009	.0011	.0012	.0013	.0015	.0018	.0018
					RPM	6420	5130	4280	3670	3210	2850	2570	2450	2340	2010	1760	1410	1170	880
					IPM(FEED)	3	5	5	5	6	7	8	9	10	9	9	8	8	6
M	12-13	Stainless steel	1.0D	1.0D (0.8D)	SFM(Vc)	485	485	485	485	485	485	485	485	485	485	485	485	485	485
					IPT(fz)	.0002	.0002	.0004	.0004	.0005	.0007	.0009	.0011	.0013	.0014	.0015	.0018	.0022	.0022
					RPM	14852	11882	9901	8487	7426	6601	5941	5401	4951	4243	3713	2970	2475	1857
					IPM(FEED)	9.36	11.23	14.03	14.7	15.2	18.48	20.58	23.81	26.51	24.39	22.8	21.05	21.44	16.08
	14.1		1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	370	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0011	.0013	.0015	.0017	.0018	.0021	.0026	.0025
					RPM	10730	8580	7150	6130	5360	4770	4290	4090	3910	3350	2930	2350	1960	1470
					IPM(FEED)	8	11	12	13	14	16	18	21	23	22	22	20	20	15
	14.2		1.0D	1.0D (0.8D)	SFM(Vc)	310	310	310	310	310	310	310	310	310	310	310	310	310	310
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0015	.0019	.0020	.0022	.0024	.0030	.0030
					RPM	9540	7630	6360	5450	4770	4240	3810	3470	3180	2720	2380	1910	1590	1190
					IPM(FEED)	8	10	13	13	14	15	17	21	24	22	21	19	19	14
K	15-20	Grey cast iron	1.0D	1.0D (0.8D)	SFM(Vc)	365	365	365	365	365	365	365	385	405	405	405	405	405	405
					IPT(fz)	.0002	.0004	.0006	.0007	.0008	.0011	.0013	.0016	.0019	.0021	.0023	.0026	.0032	.0031
					RPM	11220	8970	7480	6410	5610	4990	4490	4290	4120	3530	3090	2470	2060	1540
					IPM(FEED)	11	14	16	17	18	21	24	28	31	29	28	25	26	19
S	31-35	Heat Resistant Super Alloys	1.0D	0.5D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	85	85	85
					IPT(fz)	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0010	.0013	.0014	.0015	.0017	.0021	.0020
					RPM	2600	2080	1730	1480	1300	1150	1040	950	870	740	650	520	430	330
					IPM(FEED)	2	2	2	2	2	3	3	4	5	4	4	4	4	3
	36-37	Titanium Alloys	1.0D	0.5D	SFM(Vc)	190	190	190	190	190	190	190	190	190	190	190	190	190	190
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0017	.0018	.0020	.0022	.0027	.0027
					RPM	5810	4650	3870	3320	2900	2580	2320	2110	1940	1660	1450	1160	970	730
					IPM(FEED)	4	5	7	7	7	8	9	11	13	12	11	10	10	8

*( ) : Short length & Neck type



NOTES:
- Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
- The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
- In profile operations, engaging more that 2xD, reduce the radial depth of cut by 50%-60%
- Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1

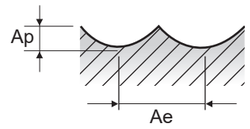
V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

UGMG53, UGMG54, UGMH10 SERIES

4 FLUTE BALL NOSE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	13/64	1/4	5/16	3/8	1/2	5/8	11/16	3/4	1
P	1-4	Non-alloy steel	0.5D	1.0D	SFM(Vc)	530	530	530	530	530	530	530	530	530	530	530
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0030	.0032	.0035	.0039
					RPM	16230	10820	9990	8110	6490	5410	4060	3250	2950	2710	2030
					IPM(FEED)	64	46	47	51	61	55	45	38	37	38	32
	5	Low alloy steel	0.5D	1.0D	SFM(Vc)	370	370	370	370	370	370	370	370	370	370	370
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0029	.0031	.0035	.0039
					RPM	11340	7560	6980	5670	4540	3780	2830	2260	2060	1890	1420
					IPM(FEED)	45	32	33	36	43	39	31	26	26	27	22
	6-7		0.5D	1.0D	SFM(Vc)	530	530	530	530	530	530	530	530	530	530	530
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0030	.0032	.0035	.0039
					RPM	16230	10820	9990	8110	6490	5410	4060	3250	2950	2710	2030
					IPM(FEED)	64	46	47	51	61	55	45	38	37	38	32
	8-9		0.5D	1.0D	SFM(Vc)	370	370	370	370	370	370	370	370	370	370	370
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0029	.0031	.0035	.0039
					RPM	11340	7560	6980	5670	4540	3780	2830	2260	2060	1890	1420
					IPM(FEED)	45	32	33	36	43	39	31	26	26	27	22
	10-11.1	High alloyed steel, and tool steel	0.5D	1.0D	SFM(Vc)	225	225	225	225	225	225	225	225	225	225	225
					IPT(fz)	.0007	.0007	.0008	.0011	.0017	.0018	.0019	.0020	.0022	.0025	.0028
					RPM	6820	4540	4190	3410	2730	2270	1700	1360	1240	1140	850
					IPM(FEED)	18	14	14	15	18	16	13	11	11	11	9
M	12-13	Stainless steel	0.5D	1.0D	SFM(Vc)	255	255	255	255	255	255	255	255	255	255	255
					IPT(fz)	.0006	.0006	.0010	.0012	.0016	.0018	.0020	.0021	.0023	.0023	.0023
					RPM	7730	5150	4760	3870	3090	2580	1930	1550	1410	1290	970
					IPM(FEED)	18	12	19	18	19	18	15	13	13	12	9
	14.1		0.5D	1.0D	SFM(Vc)	280	280	280	280	280	280	280	280	280	280	280
					IPT(fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027
					RPM	8530	5680	5250	4260	3410	2840	2130	1710	1550	1420	1070
					IPM(FEED)	27	18	21	28	24	22	18	16	16	15	11
	14.2		0.5D	1.0D	SFM(Vc)	255	255	255	255	255	255	255	255	255	255	255
					IPT(fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027
					RPM	7730	5150	4760	3870	3090	2580	1930	1550	1410	1290	970
					IPM(FEED)	24	16	19	25	22	20	17	15	14	13	10
K	15-20	Grey cast iron	0.5D	1.0D	SFM(Vc)	390	390	390	390	390	390	390	390	390	390	390
					IPT(fz)	.0012	.0013	.0015	.0020	.0029	.0032	.0034	.0037	.0039	.0044	.0049
					RPM	11920	7950	7330	5960	4770	3970	2980	2380	2170	1990	1490
					IPM(FEED)	58	41	43	47	56	51	41	35	34	35	29
S	31-35	Heat Resistant Super Alloys	0.2D	0.3D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0006	.0006	.0007	.0011	.0012	.0014	.0015	.0017	.0018	.0018	.0019
					RPM	2110	1410	1300	1050	840	700	530	420	380	350	260
					IPM(FEED)	5	3	3	5	4	4	3	3	3	2	2
	36-37	Titanium Alloys	0.5D	0.3D	SFM(Vc)	155	155	155	155	155	155	155	155	155	155	155
					IPT(fz)	.0007	.0007	.0009	.0015	.0016	.0018	.0019	.0021	.0023	.0023	.0024
					RPM	4710	3140	2900	2350	1880	1570	1180	940	860	780	590
					IPM(FEED)	13	9	10	14	12	11	9	8	8	7	6



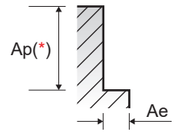
V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

UGMG20, UGMG21, UGMG22 UGMG23, UGMH08, UGMH09 SERIES

6 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.05D	2.0D	SFM(Vc)	985	985	985	985	985	985	985
					IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15040	12030	10020	7520	6010	5010	3760
					IPM(FEED)	242	330	341	307	287	266	206
	5	Low alloy steel	0.05D	2.0D	SFM(Vc)	665	665	665	665	665	665	665
					IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10180	8140	6780	5090	4070	3390	2540
					IPM(FEED)	120	163	170	154	143	134	105
	6-7		0.05D	2.0D	SFM(Vc)	985	985	985	985	985	985	985
					IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15040	12030	10020	7520	6010	5010	3760
					IPM(FEED)	242	330	341	307	287	266	206
	8-9		0.05D	2.0D	SFM(Vc)	665	665	665	665	665	665	665
					IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10180	8140	6780	5090	4070	3390	2540
					IPM(FEED)	120	163	170	154	143	134	105
	10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	330	330	330	330	330	330	330
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0057
					RPM	5010	4010	3340	2510	2010	1670	1250
					IPM(FEED)	49	67	69	62	58	54	43
M	12-13	Stainless steel	0.05D	2.0D	SFM(Vc)	700	700	700	700	700	700	700
					IPT(fz)	.0019	.0033	.0041	.0049	.0058	.0064	.0066
					RPM	10680	8550	7120	5340	4270	3560	2670
					IPM(FEED)	124	170	175	158	147	136	106
	14.1		0.05D	2.0D	SFM(Vc)	480	480	480	480	480	480	480
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					RPM	7370	5890	4910	3680	2950	2460	1840
					IPM(FEED)	71	99	102	91	86	79	62
	14.2		0.05D	2.0D	SFM(Vc)	440	440	440	440	440	440	440
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					RPM	6720	5380	4480	3360	2690	2240	1680
					IPM(FEED)	65	90	93	83	78	73	56
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.0D	SFM(Vc)	740	740	740	740	740	740	740
					IPT(fz)	.0032	.0055	.0068	.0082	.0095	.0106	.0110
					RPM	11310	9050	7540	5650	4520	3770	2830
					IPM(FEED)	218	297	308	277	259	240	186
S	31-35	Heat Resistant Super Alloys	0.05D	2.0D	SFM(Vc)	110	110	110	110	110	110	110
					IPT(fz)	.0013	.0022	.0028	.0032	.0038	.0044	.0045
					RPM	1650	1320	1100	830	660	550	410
					IPM(FEED)	13	17	18	16	15	15	11
	36-37	Titanium Alloys	0.05D	2.0D	SFM(Vc)	380	380	380	380	380	380	380
					IPT(fz)	.0013	.0022	.0028	.0033	.0038	.0045	.0046
					RPM	5820	4660	3880	2910	2330	1940	1460
					IPM(FEED)	45	61	64	57	53	52	40



(*) : If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C x 90%

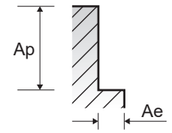
V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

GMH72 SERIES

6 FLUTE CHIP SPLITTER - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.05D	3.0D	SFM(Vc)	985	985	985	985	985
					IPT(fz)	.0057	.0068	.0080	.0089	.0091
					RPM	10020	7520	6010	5010	3760
					IPM(FEED)	341	307	287	266	206
	5	Low alloy steel	0.05D	3.0D	SFM(Vc)	665	665	665	665	665
					IPT(fz)	.0042	.0050	.0059	.0066	.0069
					RPM	6780	5090	4070	3390	2540
					IPM(FEED)	170	154	143	134	105
	6-7		0.05D	3.0D	SFM(Vc)	985	985	985	985	985
					IPT(fz)	.0057	.0068	.0080	.0089	.0091
					RPM	10020	7520	6010	5010	3760
					IPM(FEED)	341	307	287	266	206
	8-9		0.05D	3.0D	SFM(Vc)	665	665	665	665	665
					IPT(fz)	.0042	.0050	.0059	.0066	.0069
					RPM	6780	5090	4070	3390	2540
					IPM(FEED)	170	154	143	134	105
	10-11.1	High alloyed steel, and tool steel	0.05D	3.0D	SFM(Vc)	330	330	330	330	330
					IPT(fz)	.0035	.0041	.0048	.0054	.0057
					RPM	3340	2510	2010	1670	1250
					IPM(FEED)	69	62	58	54	43
M	12-13	Stainless steel	0.05D	3.0D	SFM(Vc)	700	700	700	700	700
					IPT(fz)	.0041	.0049	.0058	.0064	.0066
					RPM	7120	5340	4270	3560	2670
					IPM(FEED)	175	158	147	136	106
	14.1		0.05D	3.0D	SFM(Vc)	480	480	480	480	480
					IPT(fz)	.0035	.0041	.0048	.0054	.0056
					RPM	4910	3680	2950	2460	1840
					IPM(FEED)	102	91	86	79	62
	14.2		0.05D	3.0D	SFM(Vc)	440	440	440	440	440
					IPT(fz)	.0035	.0041	.0048	.0054	.0056
					RPM	4480	3360	2690	2240	1680
					IPM(FEED)	93	83	78	73	56
K	15-20	Grey cast iron	0.05D	3.0D	SFM(Vc)	740	740	740	740	740
					IPT(fz)	.0068	.0082	.0095	.0106	.0110
					RPM	7540	5650	4520	3770	2830
					IPM(FEED)	308	277	259	240	186
S	31-35	Heat Resistant Super Alloys	0.05D	3.0D	SFM(Vc)	110	110	110	110	110
					IPT(fz)	.0028	.0032	.0038	.0044	.0045
					RPM	1100	830	660	550	410
					IPM(FEED)	18	16	15	15	11
	36-37	Titanium Alloys	0.05D	3.0D	SFM(Vc)	380	380	380	380	380
					IPT(fz)	.0028	.0033	.0038	.0045	.0046
					RPM	3880	2910	2330	1940	1460
					IPM(FEED)	64	57	53	52	40



V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

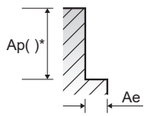
GMF52, GMF53, GMF54, GMF55, GMF56, GMF57 GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES

4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025
					RPM	16130	12100	9680	8060	6050	5350	4460	3820	3340	2970	2670	2140
					IPM(FEED)	13	15	17	20	26	32	33	29	28	28	27	22
	5	Low alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	11350	8520	6810	5680	4260	3720	3100	2660	2330	2070	1860	1490
					IPM(FEED)	9	11	12	14	18	22	23	21	19	19	19	15
	6-7		0.5D	1.5D (1.2D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025
					RPM	16130	12100	9680	8060	6050	5350	4460	3820	3340	2970	2670	2140
					IPM(FEED)	13	15	17	20	26	32	33	29	28	28	27	22
	8-9		0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	11350	8520	6810	5680	4260	3720	3100	2660	2330	2070	1860	1490
					IPM(FEED)	9	11	12	14	18	22	23	21	19	19	19	15
	10-11.1	High alloyed steel, and tool steel	0.5D	1.5D (1.2D)	SFM(Vc)	210	210	210	210	210	230	230	230	230	230	230	230
					IPT(fz)	.0001	.0002	.0003	.0004	.0008	.0011	.0013	.0013	.0015	.0016	.0018	.0018
					RPM	6790	5090	4070	3400	2550	2230	1860	1590	1390	1240	1110	890
					IPM(FEED)	3	5	5	6	8	9	9	9	8	8	8	6
M	12-13	Stainless steel	0.5D	1.5D (1.2D)	SFM(Vc)	485	485	485	485	485	485	485	485	485	485	485	485
					IPT(fz)	.0002	.0002	.0004	.0005	.0009	.0013	.0015	.0017	.0018	.0020	.0022	.0022
					RPM	15700	11780	9420	7850	5890	4710	3930	3370	2940	2620	2360	1880
					IPM(FEED)	10	11	13	16	20	25	24	22	21	21	20	16
	14.1		0.5D	1.5D (1.2D)	SFM(Vc)	350	350	350	350	350	350	350	350	350	350	350	350
					IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0028	.0030	.0030
					RPM	11250	8440	6750	5620	4220	3370	2810	2410	2110	1870	1690	1350
					IPM(FEED)	9	11	14	16	19	26	24	22	21	21	20	16
	14.2		0.5D	1.5D (1.2D)	SFM(Vc)	310	310	310	310	310	310	310	310	310	310	310	310
					IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0027	.0030	.0030
					RPM	10080	7560	6050	5040	3780	3020	2520	2160	1890	1680	1510	1210
					IPM(FEED)	8	10	12	14	17	23	22	20	18	18	18	14
K	15-20	Grey cast iron	0.5D	1.5D (1.2D)	SFM(Vc)	365	365	365	365	365	405	405	405	405	405	405	405
					IPT(fz)	.0002	.0004	.0006	.0008	.0013	.0019	.0023	.0024	.0026	.0029	.0032	.0031
					RPM	11880	8910	7130	5940	4460	3920	3260	2800	2450	2180	1960	1570
					IPM(FEED)	11	14	16	19	24	30	30	27	25	25	25	19
S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	85
					IPT(fz)	.0002	.0003	.0003	.0005	.0008	.0013	.0015	.0016	.0017	.0019	.0021	.0021
					RPM	2760	2070	1660	1380	1040	830	690	590	520	460	410	330
					IPM(FEED)	2	2	2	3	3	4	4	4	4	3	4	3
	36-37	Titanium Alloys	0.35D	1.0D	SFM(Vc)	190	190	190	190	190	190	190	190	190	190	190	190
					IPT(fz)	.0002	.0003	.0004	.0006	.0010	.0017	.0020	.0021	.0022	.0024	.0027	.0027
					RPM	6150	4620	3690	3080	2310	1850	1540	1320	1150	1030	920	740
					IPM(FEED)	4	5	6	8	9	12	12	11	10	10	10	8

*( ) : Short length & Neck type



NOTES:
- Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
- The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
- In profile operations, engaging more that 2xD, reduce the radial depth of cut by 50%-60%
- Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1

V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

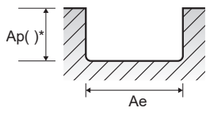
GMF52, GMF53, GMF54, GMF55, GMF56, GMF57 GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES

4 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025
					RPM	16130	12100	9680	8060	6050	5350	4460	3820	3340	2970	2670	2140
					IPM(FEED)	13	15	17	20	26	32	33	29	28	28	27	22
	5	Low alloy steel	1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	11350	8520	6810	5680	4260	3720	3100	2660	2330	2070	1860	1490
					IPM(FEED)	9	11	12	14	18	22	23	21	19	19	19	15
	6-7		1.0D	1.0D (0.8D)	SFM(Vc)	500	500	500	500	500	550	550	550	550	550	550	550
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0019	.0019	.0021	.0023	.0026	.0025
					RPM	16130	12100	9680	8060	6050	5350	4460	3820	3340	2970	2670	2140
					IPM(FEED)	13	15	17	20	26	32	33	29	28	28	27	22
	8-9		1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	385	385	385	385	385	385	385
					IPT(fz)	.0002	.0003	.0004	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	11350	8520	6810	5680	4260	3720	3100	2660	2330	2070	1860	1490
					IPM(FEED)	9	11	12	14	18	22	23	21	19	19	19	15
	10-11.1	High alloyed steel, and tool steel	1.0D	1.0D (0.8D)	SFM(Vc)	210	210	210	210	210	230	230	230	230	230	230	230
					IPT(fz)	.0001	.0002	.0003	.0004	.0008	.0011	.0013	.0013	.0015	.0016	.0018	.0018
					RPM	6790	5090	4070	3400	2550	2230	1860	1590	1390	1240	1110	890
					IPM(FEED)	3	5	5	6	8	9	9	9	8	8	8	6
M	12-13	Stainless steel	1.0D	1.0D (0.8D)	SFM(Vc)	485	485	485	485	485	485	485	485	485	485	485	485
					IPT(fz)	.0002	.0002	.0004	.0005	.0009	.0013	.0015	.0017	.0018	.0020	.0022	.0022
					RPM	15700	11780	9420	7850	5890	4710	3930	3370	2940	2620	2360	1880
					IPM(FEED)	10	11	13	16	20	25	24	22	21	21	20	16
	14.1		1.0D	1.0D (0.8D)	SFM(Vc)	350	350	350	350	350	350	350	350	350	350	350	350
					IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0028	.0030	.0030
					RPM	11250	8440	6750	5620	4220	3370	2810	2410	2110	1870	1690	1350
					IPM(FEED)	9	11	14	16	19	26	24	22	21	21	20	16
	14.2		1.0D	1.0D (0.8D)	SFM(Vc)	310	310	310	310	310	310	310	310	310	310	310	310
					IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0024	.0027	.0030	.0030
					RPM	10080	7560	6050	5040	3780	3020	2520	2160	1890	1680	1510	1210
					IPM(FEED)	8	10	12	14	17	23	22	20	18	18	18	14
K	15-20	Grey cast iron	1.0D	1.0D (0.8D)	SFM(Vc)	365	365	365	365	365	405	405	405	405	405	405	405
					IPT(fz)	.0002	.0004	.0006	.0008	.0013	.0019	.0023	.0024	.0026	.0029	.0032	.0031
					RPM	11880	8910	7130	5940	4460	3920	3260	2800	2450	2180	1960	1570
					IPM(FEED)	11	14	16	19	24	30	30	27	25	25	25	19
S	31-35	Heat Resistant Super Alloys	1.0D	0.5D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	85
					IPT(fz)	.0002	.0003	.0003	.0005	.0008	.0013	.0015	.0016	.0017	.0019	.0021	.0021
					RPM	2760	2070	1660	1380	1040	830	690	590	520	460	410	330
					IPM(FEED)	2	2	2	3	3	4	4	4	4	3	4	3
	36-37	Titanium Alloys	1.0D	0.5D	SFM(Vc)	190	190	190	190	190	190	190	190	190	190	190	190
					IPT(fz)	.0002	.0003	.0004	.0006	.0010	.0017	.0020	.0021	.0022	.0024	.0027	.0027
					RPM	6150	4620	3690	3080	2310	1850	1540	1320	1150	1030	920	740
					IPM(FEED)	4	5	6	8	9	12	12	11	10	10	10	8

*( ) : Short length & Neck type



NOTES:
- Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
- The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
- In profile operations, engaging more that 2xD, reduce the radial depth of cut by 50%-60%
- Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2%xD1

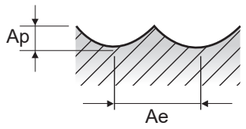
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

GMG55, GMG56 SERIES — 4 FLUTE BALL NOSE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0
P	1-4	Non-alloy steel	0.5D	1.0D	SFM(Vc)	530	530	530	530	530	530	530	530	530	530	530
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0030	.0032	.0035	.0039
					RPM	17190	12890	10310	8590	6450	5160	4300	3220	2870	2580	2060
					IPM(FEED)	68	55	49	54	61	53	47	38	36	37	32
	5	Low alloy steel	0.5D	1.0D	SFM(Vc)	370	370	370	370	370	370	370	370	370	370	370
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0029	.0031	.0035	.0039
					RPM	11990	8990	7190	6000	4500	3600	3000	2250	2000	1800	1440
					IPM(FEED)	47	38	34	38	42	37	33	26	25	25	22
	6-7		0.5D	1.0D	SFM(Vc)	530	530	530	530	530	530	530	530	530	530	530
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0030	.0032	.0035	.0039
					RPM	17190	12890	10310	8590	6450	5160	4300	3220	2870	2580	2060
					IPM(FEED)	68	55	49	54	61	53	47	38	36	37	32
	8-9		0.5D	1.0D	SFM(Vc)	370	370	370	370	370	370	370	370	370	370	370
					IPT(fz)	.0010	.0011	.0012	.0016	.0024	.0026	.0028	.0029	.0031	.0035	.0039
					RPM	11990	8990	7190	6000	4500	3600	3000	2250	2000	1800	1440
					IPM(FEED)	47	38	34	38	42	37	33	26	25	25	22
	10-11.1	High alloyed steel, and tool steel	0.5D	1.0D	SFM(Vc)	225	225	225	225	225	225	225	225	225	225	225
					IPT(fz)	.0007	.0007	.0008	.0011	.0017	.0018	.0019	.0020	.0022	.0025	.0028
					RPM	7220	5410	4330	3610	2710	2170	1800	1350	1200	1080	870
					IPM(FEED)	19	16	14	16	18	15	14	11	11	11	10
M	12-13	Stainless steel	0.5D	1.0D	SFM(Vc)	255	255	255	255	255	255	255	255	255	255	255
					IPT(fz)	.0006	.0006	.0010	.0012	.0016	.0018	.0020	.0021	.0023	.0023	.0023
					RPM	8170	6130	4900	4090	3060	2450	2040	1530	1360	1230	980
					IPM(FEED)	19	14	19	19	19	17	16	13	13	11	9
	14.1		0.5D	1.0D	SFM(Vc)	280	280	280	280	280	280	280	280	280	280	280
					IPT(fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027
					RPM	9020	6760	5410	4510	3380	2710	2260	1690	1500	1350	1080
					IPM(FEED)	28	21	21	29	24	21	20	16	15	14	12
	14.2		0.5D	1.0D	SFM(Vc)	255	255	255	255	255	255	255	255	255	255	255
					IPT(fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027
					RPM	8170	6130	4900	4090	3060	2450	2040	1530	1360	1230	980
					IPM(FEED)	26	19	19	26	22	19	18	14	14	13	11
K	15-20	Grey cast iron	0.5D	1.0D	SFM(Vc)	390	390	390	390	390	390	390	390	390	390	390
					IPT(fz)	.0012	.0013	.0015	.0020	.0029	.0032	.0034	.0037	.0039	.0044	.0049
					RPM	12630	9470	7580	6310	4740	3790	3160	2370	2100	1890	1520
					IPM(FEED)	62	49	44	50	55	48	43	35	33	33	30
S	31-35	Heat Resistant Super Alloys	0.2D	0.3D	SFM(Vc)	70	70	70	70	70	70	70	70	70	70	70
					IPT(fz)	.0006	.0006	.0007	.0011	.0012	.0014	.0015	.0017	.0018	.0018	.0019
					RPM	2230	1670	1340	1110	840	670	560	420	370	330	270
					IPM(FEED)	5	4	4	5	4	4	3	3	3	2	2
	36-37	Titanium Alloys	0.5D	0.3D	SFM(Vc)	155	155	155	155	155	155	155	155	155	155	155
					IPT(fz)	.0007	.0007	.0009	.0015	.0016	.0018	.0019	.0021	.0023	.0023	.0024
					RPM	4990	3740	2990	2490	1870	1500	1250	940	830	750	600
					IPM(FEED)	14	11	10	15	12	11	10	8	8	7	6

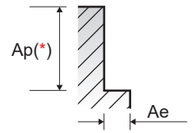


V7 PLUS A END MILLS — RECOMMENDED CUTTING CONDITIONS

GMG12, GMG13, GMG14, GMG15 GMG16, GMG17, GMG18, GMG19 SERIES — 6 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.05D	2.0D	SFM(Vc)	985	985	985	985	985	985	985
					IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15920	11940	9550	7960	5970	4780	3820
					IPM(FEED)	256	327	325	325	285	254	209
	5	Low alloy steel	0.05D	2.0D	SFM(Vc)	665	665	665	665	665	665	665
					IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10770	8080	6460	5390	4040	3230	2590
					IPM(FEED)	127	162	162	163	142	127	106
	6-7		0.05D	2.0D	SFM(Vc)	985	985	985	985	985	985	985
					IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15920	11940	9550	7960	5970	4780	3820
					IPM(FEED)	256	327	325	325	285	254	209
	8-9		0.05D	2.0D	SFM(Vc)	665	665	665	665	665	665	665
					IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10770	8080	6460	5390	4040	3230	2590
					IPM(FEED)	127	162	162	163	142	127	106
	10-11.1	High alloyed steel, and tool steel	0.05D	2.0D	SFM(Vc)	330	330	330	330	330	330	330
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0057
					RPM	5310	3980	3180	2650	1990	1590	1270
					IPM(FEED)	51	67	66	66	58	52	43
M	12-13	Stainless steel	0.05D	2.0D	SFM(Vc)	700	700	700	700	700	700	700
					IPT(fz)	.0019	.0033	.0041	.0049	.0058	.0064	.0066
					RPM	11300	8480	6780	5650	4240	3390	2710
					IPM(FEED)	131	168	167	167	146	130	108
	14.1		0.05D	2.0D	SFM(Vc)	480	480	480	480	480	480	480
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					RPM	7800	5850	4680	3900	2920	2340	1870
					IPM(FEED)	76	98	97	97	85	76	63
	14.2		0.05D	2.0D	SFM(Vc)	440	440	440	440	440	440	440
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					RPM	7110	5330	4270	3550	2670	2130	1710
					IPM(FEED)	69	89	89	88	77	69	57
K	15-20	Grey cast iron	0.05D	2.0D	SFM(Vc)	740	740	740	740	740	740	740
					IPT(fz)	.0032	.0055	.0068	.0082	.0095	.0106	.0110
					RPM	11940	8950	7160	5970	4480	3580	2870
					IPM(FEED)	230	294	292	293	256	228	188
S	31-35	Heat Resistant Super Alloys	0.05D	2.0D	SFM(Vc)	110	110	110	110	110	110	110
					IPT(fz)	.0013	.0022	.0028	.0032	.0038	.0044	.0045
					RPM	1750	1310	1050	880	660	530	420
					IPM(FEED)	14	17	17	17	15	14	11
	36-37	Titanium Alloys	0.05D	2.0D	SFM(Vc)	380	380	380	380	380	380	380
					IPT(fz)	.0013	.0022	.0028	.0033	.0038	.0045	.0046
					RPM	6150	4620	3690	3080	2310	1850	1480
					IPM(FEED)	48	60	61	60	53	49	41



(*) : If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C x 90%

V7 PLUS A END MILLS

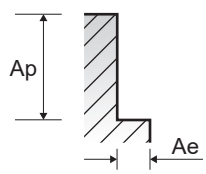
RECOMMENDED CUTTING CONDITIONS

GMH56, GMH58, GMH57, GMH59 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

6 FLUTE CHIP SPLITTER - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0	25.0
P	1-4	Non-alloy steel	0.05D	3.0D	SFM(Vc)	985	985	985	985	985	985	985
					IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15920	11940	9550	7960	5970	4780	3820
					IPM(FEED)	256	327	325	325	285	254	209
	5	Low alloy steel	0.05D	3.0D	SFM(Vc)	665	665	665	665	665	665	665
					IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10770	8080	6460	5390	4040	3230	2590
					IPM(FEED)	127	162	162	163	142	127	106
	6-7		0.05D	3.0D	SFM(Vc)	985	985	985	985	985	985	985
					IPT(fz)	.0027	.0046	.0057	.0068	.0080	.0089	.0091
					RPM	15920	11940	9550	7960	5970	4780	3820
					IPM(FEED)	256	327	325	325	285	254	209
	8-9		0.05D	3.0D	SFM(Vc)	665	665	665	665	665	665	665
					IPT(fz)	.0020	.0034	.0042	.0050	.0059	.0066	.0069
					RPM	10770	8080	6460	5390	4040	3230	2590
					IPM(FEED)	127	162	162	163	142	127	106
	10-11.1	High alloyed steel, and tool steel	0.05D	3.0D	SFM(Vc)	330	330	330	330	330	330	330
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0057
					RPM	5310	3980	3180	2650	1990	1590	1270
					IPM(FEED)	51	67	66	66	58	52	43
M	12-13	Stainless steel	0.05D	3.0D	SFM(Vc)	700	700	700	700	700	700	700
					IPT(fz)	.0019	.0033	.0041	.0049	.0058	.0064	.0066
					RPM	11300	8480	6780	5650	4240	3390	2710
					IPM(FEED)	131	168	167	167	146	130	108
	14.1		0.05D	3.0D	SFM(Vc)	480	480	480	480	480	480	480
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					RPM	7800	5850	4680	3900	2920	2340	1870
					IPM(FEED)	76	98	97	97	85	76	63
	14.2		0.05D	3.0D	SFM(Vc)	440	440	440	440	440	440	440
					IPT(fz)	.0016	.0028	.0035	.0041	.0048	.0054	.0056
					RPM	7110	5330	4270	3550	2670	2130	1710
					IPM(FEED)	69	89	89	88	77	69	57
K	15-20	Grey cast iron	0.05D	3.0D	SFM(Vc)	740	740	740	740	740	740	740
					IPT(fz)	.0032	.0055	.0068	.0082	.0095	.0106	.0110
					RPM	11940	8950	7160	5970	4480	3580	2870
					IPM(FEED)	230	294	292	293	256	228	188
S	31-35	Heat Resistant Super Alloys	0.05D	3.0D	SFM(Vc)	110	110	110	110	110	110	110
					IPT(fz)	.0013	.0022	.0028	.0032	.0038	.0044	.0045
					RPM	1750	1310	1050	880	660	530	420
					IPM(FEED)	14	17	17	17	15	14	11
	36-37	Titanium Alloys	0.05D	3.0D	SFM(Vc)	380	380	380	380	380	380	380
					IPT(fz)	.0013	.0022	.0028	.0033	.0038	.0045	.0046
					RPM	6150	4620	3690	3080	2310	1850	1480
					IPM(FEED)	48	60	61	60	53	49	41



Leading Through Innovation

SOLID CARBIDE

V7 MILL INOX END MILLS

- Silent Cutting of Stainless Steels up to HRc40 / Designed as Variable Leads, YG-1's Patent

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
V7 MILL INOX END MILLS

Silent Cutting of Stainless Steels up to HRc40 / Designed as Variable Leads, YG-1's Patent

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C647

							Inch			
						SERIES	EMC75 EMD60	EMC76 EMD61	EMB12 EMB37	EMB13 EMB38
						FLUTE	4	4	4	4
						HELIX ANGLE	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL
						CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS
						SIZE MIN	D1/8	D1/8	D1/8	D1/8
						SIZE MAX	D1	D1	D1	D1
						PAGE	C634	C635	C636	C637
							STUB LENGTH	STUB LENGTH	REGULAR LENGTH	REGULAR LENGTH
							AlTiN			
							U.S.A Stock			
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	○	○	○	○
	4		About 0.75% C	Annealed	270	28	○	○	○	○
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	○	○	○	○
	8			Quenched & Tempered	300	32	○	○	○	○
	9			Quenched & Tempered	350	38	○	○	○	○
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	○	○	○	○
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎
	14		Austenitic		180	10	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60					
	22		Curable	Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75					
	24		≤ 12% Si, Curable	Hardened	90					
	25		> 12% Si, Not Curable		130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110					
	27		CuZn, CuSnZn (Brass)		90					
	28		CuSn, lead Free copper and electrolytic copper		100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic							
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○	○
	32			Cured	280	30	○	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○	○
	34			Cured	350	38	○	○	○	○
	35			Cast	320	34	○	○	○	○
	36	Titanium Alloys	Pure Titanium		400 Rm		◎	◎	◎	◎
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎	◎	◎	◎
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

							Inch			Metric					
							EMB20	EMB78 EMB79	EMB76 EMB77	EMB41 EMB42	EMB43 EMB44	EMB14 EMB39	EMB15 EMB40	EMB74 EMB75	EMB72 EMB73
							4	4	5	4	4	4	4	4	5
							SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL	SINUSOIDAL
							SQUARE	BALL NOSE	SQUARE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	BALL NOSE	SQUARE
							D1/4	R1/16	D1/4	D3.0	D3.0	D3.0	D3.0	R1.5	D6.0
							D1	R1/2	D1	D20.0	D20.0	D25.0	D25.0	R12.5	D25.0
							C638	C639	C640	C641	C642	C643	C644	C645	C646
							EXTENDED LENGTH LONG REACH	REGULAR LENGTH	REGULAR LENGTH	SHORT LENGTH	SHORT LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH
							AlTiN			AlTiN					
							U.S.A Stock			Call for Availability					
							◎	◎	◎	◎	◎	◎	◎	◎	◎
							◎	◎	◎	◎	◎	◎	◎	◎	◎
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							◎	◎	◎	◎	◎	◎	◎	◎	◎

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

V7 MILL INOX END MILLS

PLAIN SHANK **EMC75** SERIES
FLAT SHANK **EMD60** SERIES

CARBIDE, 4 FLUTE STUB LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | PLAIN | FLAT | AlTiN

p.C647

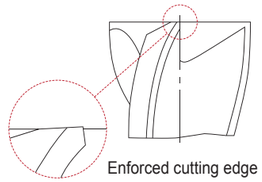
◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC75008	-	**1/8**	1/8	1/8	1-1/2
EMC75010	-	**5/32**	3/16	3/16	2
EMC75012	-	**3/16**	3/16	3/16	2
EMC75014	-	**7/32**	1/4	1/4	2
EMC75016	-	**1/4**	1/4	1/4	2
EMC75020	-	**5/16**	5/16	5/16	2
-	**EMD60024**	**3/8**	3/8	3/8	2
-	**EMD60028**	**7/16**	7/16	7/16	2-1/2
-	**EMD60032**	**1/2**	1/2	1/2	2-1/2
-	**EMD60040**	**5/8**	5/8	5/8	3
-	**EMD60048**	**3/4**	3/4	3/4	3
-	**EMD60064**	**1**	1	1	4

▶ Shanks 3/8″ and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMC76** SERIES
FLAT SHANK **EMD61** SERIES

CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | PLAIN | FLAT | AlTiN

p.C647

◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMC76008	-	R.015	**1/8**	1/8	1/8	1-1/2
EMC76010	-	R.015	**5/32**	3/16	3/16	2
EMC76012	-	R.015	**3/16**	3/16	3/16	2
EMC76014	-	R.020	**7/32**	1/4	1/4	2
EMC76016	-	R.020	**1/4**	1/4	1/4	2
EMC76020	-	R.020	**5/16**	5/16	5/16	2
-	**EMD61024**	R.020	**3/8**	3/8	3/8	2
-	**EMD61028**	R.020	**7/16**	7/16	7/16	2-1/2
-	**EMD61032**	R.030	**1/2**	1/2	1/2	2-1/2
-	**EMD61040**	R.040	**5/8**	5/8	5/8	3
-	**EMD61048**	R.040	**3/4**	3/4	3/4	3
-	**EMD61064**	R.040	**1**	1	1	4

▶ Shanks 3/8″ and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB12** SERIES
FLAT SHANK **EMB37** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | PLAIN | FLAT | AlTiN

p.C647

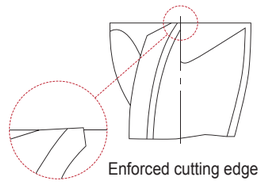
◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMB12008	-	**1/8**	1/8	3/8	1-1/2
EMB12010	-	**5/32**	3/16	7/16	2
EMB12012	-	**3/16**	3/16	7/16	2
EMB12014	-	**7/32**	1/4	7/16	2-1/2
EMB12016	-	**1/4**	1/4	1/2	2-1/2
EMB12018	-	**9/32**	5/16	5/8	2-1/2
EMB12020	-	**5/16**	5/16	13/16	2-1/2
EMB12022	-	**11/32**	3/8	13/16	2-1/2
-	**EMB37024**	**3/8**	3/8	7/8	2-1/2
-	**EMB37026**	**13/32**	7/16	15/16	2-3/4
-	**EMB37028**	**7/16**	7/16	1	2-3/4
-	**EMB37030**	**15/32**	1/2	1	3
-	**EMB37032**	**1/2**	1/2	1	3
-	**EMB37036**	**9/16**	9/16	1-1/8	3-1/2
-	**EMB37040**	**5/8**	5/8	1-1/4	3-1/2
-	**EMB37048**	**3/4**	3/4	1-1/2	4
-	**EMB37064**	**1**	1	1-1/2	4

▶ Shanks 3/8″ and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎							

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB13** SERIES
FLAT SHANK **EMB38** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | PLAIN | FLAT | AlTiN

p.C647

◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMB13008	-	R.015	**1/8**	1/8	3/8	1-1/2
EMB13012	-	R.015	**3/16**	3/16	7/16	2
EMB13016	-	R.020	**1/4**	1/4	1/2	2-1/2
EMB13020	-	R.020	**5/16**	5/16	13/16	2-1/2
-	**EMB38024**	R.020	**3/8**	3/8	7/8	2-1/2
-	**EMB38028**	R.020	**7/16**	7/16	1	2-3/4
-	**EMB38032**	R.030	**1/2**	1/2	1	3
-	**EMB38036**	R.030	**9/16**	9/16	1-1/8	3-1/2
-	**EMB38040**	R.040	**5/8**	5/8	1-1/4	3-1/2
-	**EMB38048**	R.040	**3/4**	3/4	1-1/2	4
-	**EMB38064**	R.040	**1**	1	1-1/2	4

▶ Shanks 3/8″ and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎							

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK / FLAT SHANK **EMB20 SERIES**

CARBIDE, 4 FLUTE EXTENDED LENGTH LONG REACH

- Higher speeds, deeper cuts and metal removal rates.
- Improved surface finishes
- New “NANO” AlTiN coating

CARBIDE | 4 | PLAIN | FLAT | AlTiN

p.C647

◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Mill Diameter	Shank Diameter	Length of Cut	Reach Length	Overall Length
EMB20160	-	1/4	1/4	3/8	1-1/4	4
-	EMB20240	3/8	3/8	1/2	1-7/8	4
-	EMB20320	1/2	1/2	5/8	2-1/4	4
-	EMB20400	5/8	5/8	3/4	2-1/4	4-1/8
-	EMB20401	5/8	5/8	3/4	3-1/4	5
-	EMB20480	3/4	3/4	1	2-1/4	4-1/4
-	EMB20481	3/4	3/4	1	3-1/4	5-1/2
-	EMB20640	1	1	1-1/8	2-1/4	4-1/2
-	EMB20641	1	1	1-1/8	3-1/4	5-1/2
-	EMB20642	1	1	1-1/8	4-1/4	6-1/2

▶ Shanks 3/8″ and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

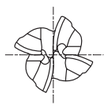
V7 MILL INOX END MILLS

PLAIN SHANK **EMB78 SERIES**

FLAT SHANK **EMB79 SERIES**

CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates



CARBIDE | 4 | R ±.0004" | PLAIN | FLAT | AlTiN

p.C649

◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Radius of Ball Nose R (±.0004)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMB78008	-	R1/16	1/8	1/8	3/8	1-1/2
EMB78010	-	R5/64	5/32	3/16	7/16	2
EMB78012	-	R3/32	3/16	3/16	7/16	2
EMB78016	-	R1/8	1/4	1/4	1/2	2-1/2
EMB78020	-	R5/32	5/16	5/16	13/16	2-1/2
-	EMB79024	R3/16	3/8	3/8	7/8	2-1/2
-	EMB79032	R1/4	1/2	1/2	1	3
-	EMB79040	R5/16	5/8	5/8	1-1/4	3-1/2
-	EMB79048	R3/8	3/4	3/4	1-1/2	4
-	EMB79064	R1/2	1	1	1-1/2	4

▶ Shanks 3/8″ and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB76** SERIES
FLAT SHANK **EMB77** SERIES

CARBIDE, 5 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 5 | PLAIN | FLAT | AlTiN | p.C650

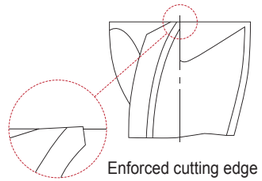
◆ U.S.A Stock

Unit : Inch

EDP No. PLAIN	EDP No. FLAT	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EMB76016	-	1/4	1/4	1/2	2-1/2
EMB76020	-	5/16	5/16	13/16	2-1/2
EMB76024	EMB77024	3/8	3/8	7/8	2-1/2
-	EMB77032	1/2	1/2	1	3
-	EMB77036	9/16	9/16	1-1/8	3-1/2
-	EMB77040	5/8	5/8	1-1/4	3-1/2
-	EMB77048	3/4	3/4	1-1/2	4
-	EMB77064	1	1	1-1/2	4

▶ Shanks 3/8″ and over come standard with Flats.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB41** SERIES
FLAT SHANK **EMB42** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

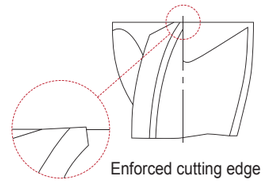
CARBIDE | 4 | PLAIN | FLAT | AlTiN | p.C651

◇ Call for Availability

Unit : mm

EDP No. PLAIN	EDP No. FLAT	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
EMB41030	EMB42030	3.0	.1181	6	7	54
EMB41040	EMB42040	4.0	.1575	6	8	54
EMB41050	EMB42050	5.0	.1969	6	10	54
EMB41060	EMB42060	6.0	.2362	6	10	54
EMB41080	EMB42080	8.0	.3150	8	12	58
EMB41100	EMB42100	10.0	.3937	10	14	66
EMB41120	EMB42120	12.0	.4724	12	16	73
EMB41140	EMB42140	14.0	.5512	14	18	75
EMB41160	EMB42160	16.0	.6299	16	22	82
EMB41180	EMB42180	18.0	.7087	18	24	84
EMB41200	EMB42200	20.0	.7874	20	26	92

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB43** SERIES
FLAT SHANK **EMB44** SERIES

CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | PLAIN | FLAT | AlTiN

p.C651

◇ Call for Availability

Unit : mm

EDP No. PLAIN	EDP No. FLAT	Corner Radius R	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
EMB43030	EMB44030	R0.3	3.0	.1181	6	7	54
EMB43040	EMB44040	R0.3	4.0	.1575	6	8	54
EMB43050	EMB44050	R0.3	5.0	.1969	6	10	54
EMB43060	EMB44060	R0.5	6.0	.2362	6	10	54
EMB43080	EMB44080	R0.5	8.0	.3150	8	12	58
EMB43100	EMB44100	R0.5	10.0	.3937	10	14	66
EMB43120	EMB44120	R0.7	12.0	.4724	12	16	73
EMB43140	EMB44140	R0.7	14.0	.5512	14	18	75
EMB43160	EMB44160	R1.0	16.0	.6299	16	22	82
EMB43180	EMB44180	R1.0	18.0	.7087	18	24	84
EMB43200	EMB44200	R1.0	20.0	.7874	20	26	92

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB14** SERIES
FLAT SHANK **EMB39** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | PLAIN | FLAT | AlTiN

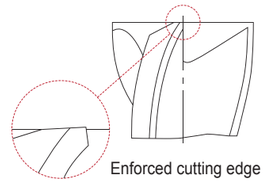
p.C651

◇ Call for Availability

Unit : mm

EDP No. PLAIN	EDP No. FLAT	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
EMB14030	-	3.0	.1181	6	8	57
EMB14040	-	4.0	.1575	6	11	57
EMB14050	-	5.0	.1969	6	13	57
EMB14060	-	6.0	.2362	6	13	57
EMB14080	-	8.0	.3150	8	19	63
EMB14100	-	10.0	.3937	10	22	72
-	EMB39120	12.0	.4724	12	26	83
-	EMB39140	14.0	.5512	14	26	83
-	EMB39160	16.0	.6299	16	32	92
-	EMB39180	18.0	.7087	18	32	92
-	EMB39200	20.0	.7874	20	38	104
-	EMB39250	25.0	.9800	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB15** SERIES
FLAT SHANK **EMB40** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | PLAIN | FLAT | AlTiN p.C651

◇ Call for Availability

Unit : mm

EDP No.		Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	Metric	Inch			
EMB15030	-	R0.3	**3.0**	**.1181**	6	8	57
EMB15040	-	R0.3	**4.0**	**.1575**	6	11	57
EMB15050	-	R0.3	**5.0**	**.1969**	6	13	57
EMB15060	-	R0.5	**6.0**	**.2362**	6	13	57
EMB15080	-	R0.5	**8.0**	**.3150**	8	19	63
EMB15100	-	R0.5	**10.0**	**.3937**	10	22	72
-	**EMB40120**	R0.7	**12.0**	**.4724**	12	26	83
-	**EMB40140**	R0.7	**14.0**	**.5512**	14	26	83
-	**EMB40160**	R1.0	**16.0**	**.6299**	16	32	92
-	**EMB40180**	R1.0	**18.0**	**.7087**	18	32	92
-	**EMB40200**	R1.0	**20.0**	**.7874**	20	38	104
-	**EMB40250**	R1.0	**25.0**	**.9800**	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB74** SERIES
FLAT SHANK **EMB75** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates

CARBIDE | 4 | R ±0.01 | PLAIN | FLAT | AlTiN p.C653

◇ Call for Availability

Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R (±0.01)	Metric	Inch			
EMB74030	**EMB75030**	R1.5	**3.0**	**.1181**	6	8	57
EMB74040	**EMB75040**	R2.0	**4.0**	**.1575**	6	11	57
EMB74050	**EMB75050**	R2.5	**5.0**	**.1969**	6	13	57
EMB74060	**EMB75060**	R3.0	**6.0**	**.2362**	6	13	57
EMB74080	**EMB75080**	R4.0	**8.0**	**.3150**	8	19	63
EMB74100	**EMB75100**	R5.0	**10.0**	**.3937**	10	22	72
EMB74120	**EMB75120**	R6.0	**12.0**	**.4724**	12	26	83
EMB74160	**EMB75160**	R8.0	**16.0**	**.6299**	16	32	92
EMB74200	**EMB75200**	R10.0	**20.0**	**.7874**	20	38	104
EMB74250	**EMB75250**	R12.5	**25.0**	**.9800**	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

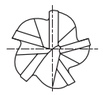
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

PLAIN SHANK **EMB72** SERIES
FLAT SHANK **EMB73** SERIES

CARBIDE, 5 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates



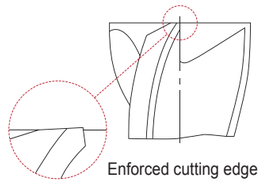
CARBIDE | 5 | PLAIN | FLAT | AlTiN | p.C654

◇ Call for Availability

Unit : mm

EDP No. PLAIN	EDP No. FLAT	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
EMB72060	EMB73060	6.0	.2362	6	13	57
EMB72080	EMB73080	8.0	.3150	8	19	63
EMB72100	EMB73100	10.0	.3937	10	22	72
EMB72120	EMB73120	12.0	.4724	12	26	83
EMB72140	EMB73140	14.0	.5512	14	26	83
EMB72160	EMB73160	16.0	.6299	16	32	92
EMB72180	EMB73180	18.0	.7087	18	32	92
EMB72200	EMB73200	20.0	.7874	20	38	104
EMB72250	EMB73250	25.0	.9800	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

V7 MILL INOX END MILLS

RECOMMENDED CUTTING CONDITIONS

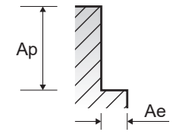
EMC75, EMD60, EMC76, EMD61, EMB12 EMB37, EMB13, EMB38, EMB20 SERIES

4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1
P	1-2	Non-alloy steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(FEED)	10	11	12	13	18	25	26	26	26	24	17
	6	Low alloy steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(FEED)	10	11	12	13	18	25	26	26	26	24	17
	10	High alloyed steel, and tool steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(FEED)	10	11	12	13	18	25	26	26	26	24	17
M	12-13	Stainless steel	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440
					IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0014	.0016	.0018	.0020	.0022	.0022
					RPM	13475	12000	6815	5390	4490	3850	3370	2990	2700	2250	1685
					IPM(FEED)	8	8	10	11	15	21	21	21	21	19	15
	14.1		0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	315	315	315	315	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0028	.0030	.0031
					RPM	9625	6385	4810	3850	3210	2750	2400	2140	1925	1600	1200
					IPM(FEED)	7	8	10	11	15	21	21	21	21	19	15
S	31-35	Heat Resistant Super Alloys	0.35D	1.0D [0.6D]	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	80
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0027	.0031	.0034
					RPM	2565	1685	1285	1025	855	735	640	570	510	425	315
					IPM(FEED)	2	2	3	3	4	6	6	6	6	5	4
	36-37	Titanium Alloys	0.5D	1.5D (1.2D) [0.6D]	SFM(Vc)	270	270	270	270	270	275	270	270	270	275	270
					IPT(fz)	.0002	.0004	.0006	.0008	.0014	.0022	.0025	.0029	.0032	.0035	.0036
					RPM	8320	5550	4160	3330	2770	2380	2080	1850	1660	1390	1040
					IPM(FEED)	8	8	10	11	15	21	21	21	21	19	15

*( ) : Short length Type
*[ ] : Stub length Type



*1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm
*0.6 x D Axial cutting depth should be applied for Stub length series.

V7 MILL INOX END MILLS

RECOMMENDED CUTTING CONDITIONS

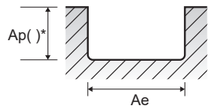
EMC75, EMD60, EMC76, EMD61, EMB12 EMB37, EMB13, EMB38, EMB20 SERIES

4 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	1.0D [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(FEED)	10	11	12	13	18	25	26	26	26	24	17
	6	Low alloy steel	1.0D	1.0D [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(FEED)	10	11	12	13	18	25	26	26	26	24	17
	10	High alloyed steel, and tool steel	1.0D	1.0D [0.6D]	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0019	.0021	.0023	.0026	.0025
					RPM	12735	8490	6370	5100	4245	4010	3500	3110	2800	2340	1755
					IPM(FEED)	10	11	12	13	18	25	26	26	26	24	17
M	12-13	Stainless steel	1.0D	1.0D [0.6D]	SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440
					IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0014	.0016	.0018	.0020	.0022	.0022
					RPM	13475	12000	6815	5390	4490	3850	3370	2990	2700	2250	1685
					IPM(FEED)	8	8	10	11	15	21	21	21	21	19	15
	14.1		1.0D	1.0D [0.6D]	SFM(Vc)	315	315	315	315	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0028	.0030	.0031
					RPM	9625	6385	4810	3850	3210	2750	2400	2140	1925	1600	1200
					IPM(FEED)	7	8	10	11	15	21	21	21	21	19	15
S	31-35	Heat Resistant Super Alloys	1.0D	0.5D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	80
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0025	.0027	.0031	.0034
					RPM	2565	1685	1285	1025	855	735	640	570	510	425	315
					IPM(FEED)	2	2	3	3	4	6	6	6	6	5	4
	36-37	Titanium Alloys	1.0D	1.0D [0.6D]	SFM(Vc)	270	270	270	270	270	275	270	270	270	275	270
					IPT(fz)	.0002	.0004	.0006	.0008	.0014	.0022	.0025	.0029	.0032	.0035	.0036
					RPM	8320	5550	4160	3330	2770	2380	2080	1850	1660	1390	1040
					IPM(FEED)	8	8	10	11	15	21	21	21	21	19	15

∗( ) : Short length Type
∗[ ] : Stub length Type



∗1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm
∗0.6 x D Axial cutting depth should be applied for Stub length series.

V7 MILL INOX END MILLS

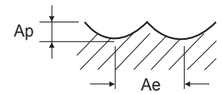
RECOMMENDED CUTTING CONDITIONS

EMB78, EMB79 SERIES

4 FLUTE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1
P	1-2	Non-alloy steel	0.5D	1.0D	SFM(Vc)	445	445	445	445	445	445	440	445	445	445	440
					IPT(fz)	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039
					RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690
					IPM(FEED)	53	43	41	51	43	40	37	34	32	32	27
	6	Low alloy steel	0.5D	1.0D	SFM(Vc)	445	445	445	445	445	445	440	445	445	445	440
					IPT(fz)	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039
					RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690
					IPM(FEED)	53	43	41	51	43	40	37	34	32	32	27
	10	High alloyed steel, and tool steel	0.5D	1.0D	SFM(Vc)	445	445	445	445	445	445	440	445	445	445	440
					IPT(fz)	.0010	.0012	.0015	.0023	.0024	.0026	.0028	.0028	.0029	.0035	.0039
					RPM	13530	9020	6770	5410	4510	3870	3380	3010	2710	2260	1690
					IPM(FEED)	53	43	41	51	43	40	37	34	32	32	27
M	12-13	Stainless steel	0.5D	1.0D	SFM(Vc)	230	230	230	230	230	230	230	230	230	230	230
					IPT(fz)	.0006	.0010	.0012	.0016	.0018	.0019	.0020	.0021	.0021	.0023	.0023
					RPM	7020	4680	3510	2810	2340	2010	1750	1560	1400	1170	880
					IPM(FEED)	16	18	16	18	17	15	14	13	12	11	8
	14.1		0.5D	1.0D	SFM(Vc)	255	255	255	255	255	255	255	255	255	255	255
					IPT(fz)	.0008	.0010	.0016	.0018	.0020	.0021	.0022	.0023	.0024	.0026	.0028
					RPM	7770	5180	3880	3110	2590	2220	1940	1730	1550	1290	970
					IPM(FEED)	24	20	25	22	20	18	17	16	15	13	11
S	31-35	Heat Resistant Super Alloys	0.2D	0.3D	SFM(Vc)	100	100	100	100	100	100	100	100	100	100	100
					IPT(fz)	.0004	.0004	.0006	.0010	.0011	.0013	.0015	.0017	.0018	.0021	.0020
					RPM	3010	2010	1500	1200	1000	860	750	670	600	500	380
					IPM(FEED)	5	3	4	5	4	4	5	5	4	4	3
	36-37	Titanium Alloys	0.5D	1.0D	SFM(Vc)	180	180	180	180	180	180	180	180	180	180	180
					IPT(fz)	.0005	.0006	.0008	.0012	.0012	.0014	.0016	.0016	.0017	.0024	.0027
					RPM	5510	3680	2760	2210	1840	1580	1380	1230	1100	920	690
					IPM(FEED)	10	9	9	10	9	9	9	8	8	9	7



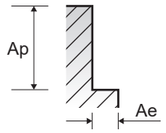
V7 MILL INOX END MILLS

RECOMMENDED CUTTING CONDITIONS

EMB76, EMB77 SERIES — 5 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1
P	1-2	Non-alloy steel	0.25D	1.25D	SFM(Vc)	450	450	450	450	450	450	450	450	450
					IPT(fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0030	.0035	.0040
					RPM	6870	5490	4580	3920	3430	3050	2750	2290	1720
					IPM(FEED)	46	41	46	44	43	42	41	40	34
	6	Low alloy steel	0.25D	1.25D	SFM(Vc)	450	450	450	450	450	450	450	450	450
					IPT(fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0030	.0035	.0040
					RPM	6870	5490	4580	3920	3430	3050	2750	2290	1720
					IPM(FEED)	46	41	46	44	43	42	41	40	34
	10	High alloyed steel, and tool steel	0.25D	1.25D	SFM(Vc)	450	450	450	450	450	450	450	450	450
					IPT(fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0030	.0035	.0040
					RPM	6870	5490	4580	3920	3430	3050	2750	2290	1720
					IPM(FEED)	46	41	46	44	43	42	41	40	34
M	12-13	Stainless steel	0.25D	1.25D	SFM(Vc)	350	350	350	350	350	350	350	350	350
					IPT(fz)	.0012	.0012	.0015	.0016	.0017	.0025	.0027	.0030	.0035
					RPM	5310	4250	3540	3040	2660	2360	2130	1770	1330
					IPM(FEED)	32	27	26	24	22	30	28	26	23
	14.1		0.25D	1.25D	SFM(Vc)	375	375	375	375	375	375	375	375	375
					IPT(fz)	.0012	.0013	.0015	.0020	.0025	.0026	.0027	.0030	.0035
					RPM	5710	4570	3810	3270	2860	2540	2290	1900	1430
					IPM(FEED)	34	29	29	33	36	33	31	29	25
S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	SFM(Vc)	90	90	90	90	90	90	90	90	90
					IPT(fz)	.0007	.0008	.0010	.0012	.0014	.0018	.0019	.0024	.0030
					RPM	1350	1080	900	770	680	600	540	450	340
					IPM(FEED)	4	4	5	5	5	5	5	5	5
	36-37	Titanium Alloys	0.25D	1.25D	SFM(Vc)	275	275	275	275	275	275	275	275	275
					IPT(fz)	.0012	.0012	.0015	.0017	.0020	.0022	.0025	.0030	.0035
					RPM	4200	3360	2800	2400	2100	1860	1680	1400	1050
					IPM(FEED)	25	21	21	21	21	21	21	21	18



V7 MILL INOX END MILLS

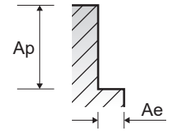
RECOMMENDED CUTTING CONDITIONS

EMB41, EMB42, EMB43, EMB44 EMB14, EMB39, EMB15, EMB40 SERIES — 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-2	Non-alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(FEED)	11	13	15	17	22	27	27	24	23	23	23	18
	6	Low alloy steel	0.5D	1.5D (1.2D)	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(FEED)	11	13	15	17	22	27	27	24	23	23	23	18
	10	High alloyed steel, and tool steel	0.5D	1.5D (1.2D)	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(FEED)	11	13	15	17	22	27	27	24	23	23	23	18
M	12-13	Stainless steel	0.5D	1.5D (1.2D)	SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440	440
					IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0013	.0016	.0017	.0018	.0020	.0022	.0022
					RPM	14260	14260	8660	7130	5350	4280	3570	3060	2670	2380	2140	1710
					IPM(FEED)	8	10	12	14	18	23	22	20	19	19	19	15
	14.1		0.5D	1.5D (1.2D)	SFM(Vc)	315	315	315	315	315	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0025	.0028	.0030	.0031
					RPM	10190	7600	6110	5100	3820	3060	2550	2180	1910	1700	1530	1220
					IPM(FEED)	8	10	12	14	17	23	22	20	19	19	19	15
S	31-35	Heat Resistant Super Alloys	0.35D	1.0D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	80
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0024	.0025	.0027	.0030	.0034
					RPM	2720	2010	1630	1360	1020	820	680	580	510	450	410	320
					IPM(FEED)	2	2	3	4	5	6	6	6	5	5	5	4
	36-37	Titanium Alloys	0.5D	1.5D (1.2D)	SFM(Vc)	315	315	315	315	270	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0014	.0019	.0022	.0023	.0025	.0028	.0030	.0031
					RPM	10190	7600	6110	5100	3280	3060	2550	2180	1910	1700	1530	1220
					IPM(FEED)	8	10	12	14	18	23	22	20	19	19	19	15

*( ) : Short length Type



*1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm

V7 MILL INOX END MILLS

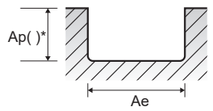
RECOMMENDED CUTTING CONDITIONS

EMB41, EMB42, EMB43, EMB44 EMB14, EMB39, EMB15, EMB40 SERIES

4 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(FEED)	11	13	15	17	22	27	27	24	23	23	23	18
	6	Low alloy steel	1.0D	1.0D	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(FEED)	11	13	15	17	22	27	27	24	23	23	23	18
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	415	415	415	415	415	460	460	460	460	460	460	460
					IPT(fz)	.0002	.0003	.0005	.0006	.0011	.0015	.0018	.0019	.0021	.0023	.0026	.0025
					RPM	13480	10110	8090	6740	5050	4460	3710	3180	2790	2480	2230	1780
					IPM(FEED)	11	13	15	17	22	27	27	24	23	23	23	18
M	12-13	Stainless steel	1.0D	1.0D	SFM(Vc)	440	590	445	440	440	440	440	440	440	440	440	440
					IPT(fz)	.0001	.0002	.0004	.0005	.0009	.0013	.0016	.0017	.0018	.0020	.0022	.0022
					RPM	14260	14260	8660	7130	5350	4280	3570	3060	2670	2380	2140	1710
					IPM(FEED)	8	10	12	14	18	23	22	20	19	19	19	15
	14.1		1.0D	1.0D	SFM(Vc)	315	315	315	315	315	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0011	.0019	.0022	.0023	.0025	.0028	.0030	.0031
					RPM	10190	7600	6110	5100	3820	3060	2550	2180	1910	1700	1530	1220
					IPM(FEED)	8	10	12	14	17	23	22	20	19	19	19	15
S	31-35	Heat Resistant Super Alloys	1.0D	0.5D	SFM(Vc)	85	85	85	85	85	85	85	85	85	85	85	80
					IPT(fz)	.0002	.0003	.0005	.0007	.0012	.0019	.0022	.0024	.0025	.0027	.0030	.0034
					RPM	2720	2010	1630	1360	1020	820	680	580	510	450	410	320
					IPM(FEED)	2	2	3	4	5	6	6	6	5	5	5	4
	36-37	Titanium Alloys	1.0D	1.0D	SFM(Vc)	315	315	315	315	270	315	315	315	315	315	315	315
					IPT(fz)	.0002	.0003	.0005	.0007	.0014	.0019	.0022	.0023	.0025	.0028	.0030	.0031
					RPM	10190	7600	6110	5100	3280	3060	2550	2180	1910	1700	1530	1220
					IPM(FEED)	8	10	12	14	18	23	22	20	19	19	19	15



*1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm

V7 MILL INOX END MILLS

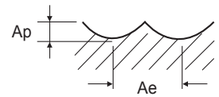
RECOMMENDED CUTTING CONDITIONS

EMB74, EMB75 SERIES

4 FLUTE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0
P	1-2	Non-alloy steel	0.5D	1.0D	SFM(Vc)	445	445	445	460	445	440	445	440	440	440	440
					IPT(fz)	.0010	.0010	.0012	.0015	.0023	.0024	.0027	.0029	.0031	.0035	.0039
					RPM	14320	10740	8590	7460	5370	4290	3580	2680	2380	2140	1710
					IPM(FEED)	56	42	41	45	50	41	39	31	30	30	27
	6	Low alloy steel	0.5D	1.0D	SFM(Vc)	445	445	445	460	445	440	445	440	440	440	440
					IPT(fz)	.0010	.0010	.0012	.0015	.0023	.0024	.0027	.0029	.0031	.0035	.0039
					RPM	14320	10740	8590	7460	5370	4290	3580	2680	2380	2140	1710
					IPM(FEED)	56	42	41	45	50	41	39	31	30	30	27
	10	High alloyed steel, and tool steel	0.5D	1.0D	SFM(Vc)	445	445	445	460	445	440	445	440	440	440	440
					IPT(fz)	.0010	.0010	.0012	.0015	.0023	.0024	.0027	.0029	.0031	.0035	.0039
					RPM	14320	10740	8590	7460	5370	4290	3580	2680	2380	2140	1710
					IPM(FEED)	56	42	41	45	50	41	39	31	30	30	27
M	12-13	Stainless steel	0.5D	1.0D	SFM(Vc)	230	230	230	230	230	230	230	230	230	230	230
					IPT(fz)	.0006	.0006	.0010	.0012	.0016	.0018	.0020	.0021	.0023	.0023	.0023
					RPM	7420	5570	4450	3710	2780	2220	1850	1390	1230	1110	890
					IPM(FEED)	17	13	17	17	17	16	15	12	11	10	8
	14.1		0.5D	1.0D	SFM(Vc)	255	255	255	255	255	255	255	255	255	255	255
					IPT(fz)	.0008	.0008	.0010	.0016	.0018	.0020	.0022	.0024	.0025	.0026	.0027
					RPM	8220	6160	4930	4110	3080	2460	2050	1540	1370	1230	980
					IPM(FEED)	26	19	19	26	22	19	18	15	14	13	11
S	31-35	Heat Resistant Super Alloys	0.2D	0.3D	SFM(Vc)	100	100	100	100	100	100	100	95	100	95	100
					IPT(fz)	.0004	.0004	.0004	.0006	.0010	.0010	.0015	.0018	.0020	.0021	.0021
					RPM	3180	2380	1910	1590	1190	950	790	590	530	470	380
					IPM(FEED)	6	4	3	4	5	4	5	4	4	4	3
	36-37	Titanium Alloys	0.5D	1.0D	SFM(Vc)	180	180	180	180	180	180	180	180	180	180	180
					IPT(fz)	.0005	.0005	.0006	.0008	.0012	.0012	.0016	.0017	.0019	.0024	.0027
					RPM	5830	4370	3500	2910	2180	1750	1450	1090	970	870	700
					IPM(FEED)	11	8	8	9	10	8	9	7	7	8	7



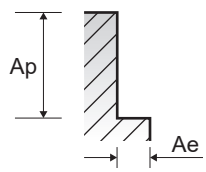
V7 MILL INOX END MILLS

RECOMMENDED CUTTING CONDITIONS

EMB72, EMB73 SERIES — 5 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-2	Non-alloy steel	0.25D	1.25D	SFM(Vc)	445	445	445	445	445	445	445
					IPT(fz)	.0013	.0015	.0020	.0025	.0027	.0030	.0035
					RPM	7160	5370	4300	3580	3070	2690	2150
					IPM(FEED)	48	40	42	44	42	40	38
	6	Low alloy steel	0.25D	1.25D	SFM(Vc)	450	450	450	450	450	450	450
					IPT(fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0035
					RPM	6870	5490	4580	3920	3430	3050	2290
					IPM(FEED)	46	41	46	44	43	42	40
	10	High alloyed steel, and tool steel	0.25D	1.25D	SFM(Vc)	450	450	450	450	450	450	450
					IPT(fz)	.0013	.0015	.0020	.0022	.0025	.0027	.0035
					RPM	6870	5490	4580	3920	3430	3050	2290
					IPM(FEED)	46	41	46	44	43	42	40
M	12-13	Stainless steel	0.25D	1.25D	SFM(Vc)	345	345	345	475	345	345	345
					IPT(fz)	.0012	.0013	.0015	.0017	.0025	.0027	.0030
					RPM	5570	4180	3340	3850	2390	2090	1670
					IPM(FEED)	33	26	25	33	30	28	25
	14.1		0.25D	1.25D	SFM(Vc)	375	380	375	375	380	380	375
					IPT(fz)	.0012	.0013	.0015	.0025	.0026	.0027	.0030
					RPM	6100	4580	3660	3050	2620	2290	1830
					IPM(FEED)	36	29	27	38	33	31	27
S	31-35	Heat Resistant Super Alloys	0.25D	1.0D	SFM(Vc)	80	80	80	80	80	80	80
					IPT(fz)	.0007	.0008	.0010	.0014	.0018	.0019	.0023
					RPM	1330	1000	800	660	570	500	400
					IPM(FEED)	4	4	4	5	5	5	5
	36-37	Titanium Alloys	0.25D	1.25D	SFM(Vc)	280	280	280	280	280	280	280
					IPT(fz)	.0012	.0012	.0015	.0020	.0022	.0025	.0030
					RPM	4510	3380	2710	2260	1930	1690	1350
					IPM(FEED)	27	21	20	22	22	21	20



Leading Through Innovation

SOLID CARBIDE

ALU-POWER HPC END MILLS

- For Aluminium, Aluminum Die Cast, Non-ferrous Alloys and Plastics

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
ALU-POWER HPC END MILLS

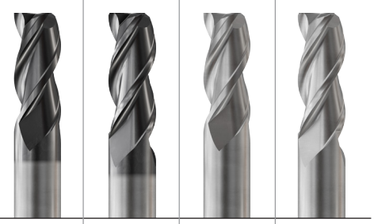
For Aluminum, Aluminum Die Cast, Non-Ferrous Alloys and Plastics

Please visit globalyg1.com/mat for material search

Recommended cutting conditions : p.C670

◎ : Excellent ○ : Good

SERIES	JAG95	JAG97	E5G95	E5G97
FLUTE	3		3	
HELIX ANGLE	37°		37°	
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS
SIZE MIN	1/8	1/8	1/8	1/8
SIZE MAX	1	1	1	1
PAGE	C658		C660	
	STANDARD LENGTH		STANDARD LENGTH	
	DLC		Uncoated	



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13				
	3		About 0.45% C	Quenched & Tempered	250	25				
	4		About 0.75% C	Annealed	270	28				
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10				
	7			Quenched & Tempered	275	29				
	8			Quenched & Tempered	300	32				
	9			Quenched & Tempered	350	38				
	10	High alloyed steel, and tool steel		Annealed	200	15				
	11			Quenched & Tempered	325	35				
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic		180	10				
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)		260	26				
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic		250	25				
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎	◎	◎
	22		Curable	Hardened	100		◎	◎	◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎	◎
	25		> 12% Si, Not Curable		130		○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				○	○	○	○
	30		Rubber, Wood, etc.							
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32			Cured	280	30				
	33		Ni or Co Based	Annealed	250	25				
	34			Cured	350	38				
	35			Cast	320	34				
	36	Titanium Alloys	Pure Titanium		400 Rm					
	37		Alpha + Beta Alloys	Hardened	1050 Rm					
H	38	Hardened steel		Hardened	550	55				
	39			Hardened	630	60				
	40	Chilled Cast Iron		Cast	400	42				
	41	Hardened Cast Iron		Hardened	550	55				

SERIES	JAG96	JAG98	E5G96	E5G98	JAI58	E5I58	JAI59	E5I59	JAI38	E5I36	E5I38	JAI39	E5I37	E5I39
FLUTE	3		3		3		3		3	3		3	3	
HELIX ANGLE	37°		37°		37°		37°		37°	37°		37°	37°	
CUTTING EDGE SHAPE	SQUARE	CORNER RADIUS	SQUARE	CORNER RADIUS	BALL NOSE		BALL NOSE		CORNER RADIUS	SQUARE	CORNER RADIUS	CORNER RADIUS	SQUARE	CORNER RADIUS
SIZE MIN	1/4	1/4	1/4	1/4	R1/16	R1/16	R3/16	R3/16	1/8	1/2	1/8	1/4	1/2	1/4
SIZE MAX	1	1	1	1	R1/2	R1/2	R1/2	R1/2	1	3/4	1	1	1/2	1
PAGE	C662		C663		C664		C665		C666	C667		C668	C669	
	EXTENDED NECK		EXTENDED NECK		STANDARD LENGTH		EXTENDED NECK		STANDARD LENGTH	STANDARD LENGTH		EXTENDED NECK	EXTENDED NECK	EXTENDED NECK
	DLC		Uncoated		DLC	Uncoated	DLC	Uncoated	DLC	Uncoated		DLC	Uncoated	
									CHIP BREAKER					

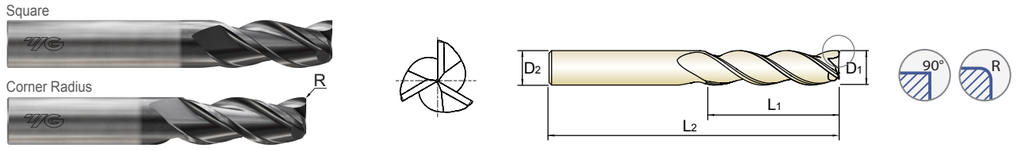
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

ALU-POWER HPC END MILLS

SQUARE **JAG95 SERIES**
CORNER RADIUS **JAG97 SERIES**

CARBIDE, 3 FLUTE STANDARD LENGTH

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life



CARBIDE | 3 | 37° | PLAIN | DLC | p.C670

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius						
					.010	.030	.060	.090	.120	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/8	1/8	1/4	1-1/2	JAG95008	JAG97008	JAG97901					
		3/8	1-1/2	JAG95901	JAG97902	JAG97903					
3/16	3/16	5/16	2	JAG95012	JAG97012	JAG97904					
		9/16	2	JAG95902	JAG97905	JAG97906					
1/4	1/4	3/8	2	JAG95016	JAG97016	JAG97907	JAG97908				
		5/8	2-1/2	JAG95903	JAG97909	JAG97910	JAG97911				
		7/8	3	JAG95929	JAG97892	JAG97893	JAG97894				
		1-1/4	3-1/4	JAG95904	JAG97912	JAG97913	JAG97914				
5/16	5/16	7/16	2	JAG95020	JAG97020	JAG97915	JAG97916	JAG97917			
		5/8	2-1/2	JAG95905	JAG97918	JAG97919	JAG97920	JAG97921			
		13/16	3	JAG95930	JAG97895	JAG97896	JAG97897	JAG97898			
		1-1/4	3-1/2	JAG95906	JAG97922	JAG97923	JAG97924	JAG97925			
3/8	3/8	1/2	2	JAG95024	JAG97024	JAG97926	JAG97927	JAG97928	JAG97929		
		1	2-1/2	JAG95907	JAG97930	JAG97931	JAG97932	JAG97933	JAG97934		
		1-1/2	3-1/2	JAG95908	JAG97935	JAG97936	JAG97937	JAG97938	JAG97939		
		2	4	JAG95909	JAG97940	JAG97941	JAG97942	JAG97943	JAG97944		
7/16	7/16	9/16	2-1/2	JAG95028	JAG97028	JAG97945	JAG97946	JAG97947	JAG97948		
		1-1/4	2-3/4	JAG95910	JAG97949	JAG97950	JAG97951	JAG97952	JAG97953		
		2	4	JAG95911	JAG97954	JAG97955	JAG97956	JAG97957	JAG97958		

▶NEXT PAGE

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

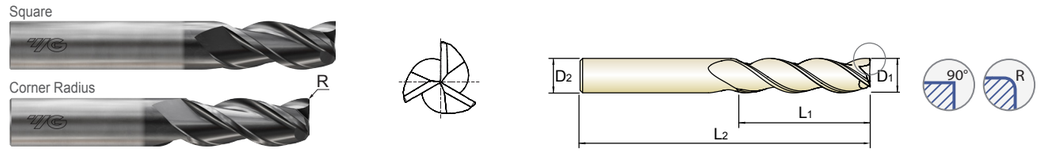
ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

ALU-POWER HPC END MILLS

SQUARE JAG95 SERIES
CORNER RADIUS JAG97 SERIES

CARBIDE, 3 FLUTE STANDARD LENGTH

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life



CARBIDE | 3 | 37° | PLAIN | DLC | p.C670

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius						
					.010	.030	.060	.090	.120	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/2	1/2	5/8	2-1/2	JAG95032	JAG97032	JAG97959	JAG97960	JAG97961	JAG97962	JAG97963	
		1	3	JAG95927	JAG97879	JAG97880	JAG97881	JAG97882	JAG97883	JAG97884	
		1-1/4	3	JAG95912	JAG97964	JAG97965	JAG97966	JAG97967	JAG97968	JAG97969	
		1-5/8	4	JAG95913	JAG97970	JAG97971	JAG97972	JAG97973	JAG97974	JAG97975	
		2	4	JAG95914	JAG97976	JAG97977	JAG97978	JAG97979	JAG97980	JAG97981	
		2-1/2	5	JAG95915	JAG97982	JAG97983	JAG97984	JAG97985	JAG97986	JAG97987	
		3	5	JAG95916	JAG97988	JAG97989	JAG97990	JAG97991	JAG97992	JAG97993	
5/8	5/8	3/4	3	JAG95040	JAG97040	JAG97994	JAG97995	JAG97996	JAG97997	JAG97998	
		1-5/8	3-1/2	JAG95917	JAG97999	JAG97801	JAG97802	JAG97803	JAG97804	JAG97805	
		2-1/2	5	JAG95918	JAG97806	JAG97807	JAG97808	JAG97809	JAG97810	JAG97811	
		3	5-1/4	JAG95919	JAG97812	JAG97813	JAG97814	JAG97815	JAG97816	JAG97817	
3/4	3/4	1	3	JAG95048	JAG97048	JAG97818	JAG97819	JAG97820	JAG97821	JAG97822	JAG97823
		1-5/8	4	JAG95920	JAG97824	JAG97825	JAG97826	JAG97827	JAG97828	JAG97829	JAG97830
		2-1/4	5	JAG95921	JAG97831	JAG97832	JAG97833	JAG97834	JAG97835	JAG97836	JAG97837
		3-1/4	6	JAG95922	JAG97838	JAG97839	JAG97840	JAG97841	JAG97842	JAG97843	JAG97844
		4	6-1/4	JAG95923	JAG97845	JAG97846	JAG97847	JAG97848	JAG97849	JAG97850	JAG97851
1	1	1-1/4	3	JAG95064	JAG97064	JAG97852	JAG97853	JAG97854	JAG97855	JAG97856	JAG97857
		1-1/4	4	JAG95928	JAG97885	JAG97886	JAG97887	JAG97888	JAG97889	JAG97890	JAG97891
		2	5	JAG95924	JAG97858	JAG97859	JAG97860	JAG97861	JAG97862	JAG97863	JAG97864
		3-1/4	6	JAG95925	JAG97865	JAG97866	JAG97867	JAG97868	JAG97869	JAG97870	JAG97871
		4	7	JAG95926	JAG97872	JAG97873	JAG97874	JAG97875	JAG97876	JAG97877	JAG97878

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

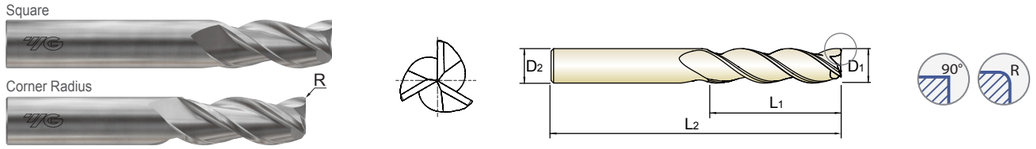
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

ALU-POWER HPC END MILLS

SQUARE **E5G95 SERIES**
CORNER RADIUS **E5G97 SERIES**

CARBIDE, 3 FLUTE STANDARD LENGTH

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces



CARBIDE | 3 | 37° | PLAIN | UNCOATED | p.C670

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius						
					.010	.030	.060	.090	.120	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/8	1/8	1/4	1-1/2	E5G95008	E5G97008	E5G97901					
		3/8	1-1/2	E5G95901	E5G97902	E5G97903					
3/16	3/16	5/16	2	E5G95012	E5G97012	E5G97904					
		9/16	2	E5G95902	E5G97905	E5G97906					
1/4	1/4	3/8	2	E5G95016	E5G97016	E5G97907	E5G97908				
		5/8	2-1/2	E5G95903	E5G97909	E5G97910	E5G97911				
		7/8	3	E5G95929	E5G97892	E5G97893	E5G97894				
		1-1/4	3-1/4	E5G95904	E5G97912	E5G97913	E5G97914				
5/16	5/16	7/16	2	E5G95020	E5G97020	E5G97915	E5G97916	E5G97917			
		5/8	2-1/2	E5G95905	E5G97918	E5G97919	E5G97920	E5G97921			
		13/16	3	E5G95930	E5G97895	E5G97896	E5G97897	E5G97898			
		1-1/4	3-1/2	E5G95906	E5G97922	E5G97923	E5G97924	E5G97925			
3/8	3/8	1/2	2	E5G95024	E5G97024	E5G97926	E5G97927	E5G97928	E5G97929		
		1	2-1/2	E5G95907	E5G97930	E5G97931	E5G97932	E5G97933	E5G97934		
		1-1/2	3-1/2	E5G95908	E5G97935	E5G97936	E5G97937	E5G97938	E5G97939		
		2	4	E5G95909	E5G97940	E5G97941	E5G97942	E5G97943	E5G97944		
7/16	7/16	9/16	2-1/2	E5G95028	E5G97028	E5G97945	E5G97946	E5G97947	E5G97948		
		1-1/4	2-3/4	E5G95910	E5G97949	E5G97950	E5G97951	E5G97952	E5G97953		
		2	4	E5G95911	E5G97954	E5G97955	E5G97956	E5G97957	E5G97958		

▶NEXT PAGE

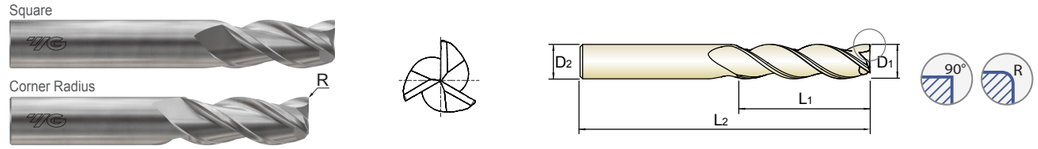
Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

ALU-POWER HPC END MILLS
SQUARE E5G95 SERIES
CORNER RADIUS E5G97 SERIES
CARBIDE, 3 FLUTE STANDARD LENGTH
- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces



CARBIDE | 3 | 37° | PLAIN | UNCOATED | p.C670

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End	Corner Radius						
					.010	.030	.060	.090	.120	.190	.250
				EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/2	1/2	5/8	2-1/2	E5G95032	E5G97032	E5G97959	E5G97960	E5G97961	E5G97962	E5G97963	
		1	3	E5G95927	E5G97879	E5G97880	E5G97881	E5G97882	E5G97883	E5G97884	
		1-1/4	3	E5G95912	E5G97964	E5G97965	E5G97966	E5G97967	E5G97968	E5G97969	
		1-5/8	4	E5G95913	E5G97970	E5G97971	E5G97972	E5G97973	E5G97974	E5G97975	
		2	4	E5G95914	E5G97976	E5G97977	E5G97978	E5G97979	E5G97980	E5G97981	
		2-1/2	5	E5G95915	E5G97982	E5G97983	E5G97984	E5G97985	E5G97986	E5G97987	
		3	5	E5G95916	E5G97988	E5G97989	E5G97990	E5G97991	E5G97992	E5G97993	
5/8	5/8	3/4	3	E5G95040	E5G97040	E5G97994	E5G97995	E5G97996	E5G97997	E5G97998	
		1-5/8	3-1/2	E5G95917	E5G97999	E5G97801	E5G97802	E5G97803	E5G97804	E5G97805	
		2-1/2	5	E5G95918	E5G97806	E5G97807	E5G97808	E5G97809	E5G97810	E5G97811	
		3	5-1/4	E5G95919	E5G97812	E5G97813	E5G97814	E5G97815	E5G97816	E5G97817	
3/4	3/4	1	3	E5G95048	E5G97048	E5G97818	E5G97819	E5G97820	E5G97821	E5G97822	E5G97823
		1-5/8	4	E5G95920	E5G97824	E5G97825	E5G97826	E5G97827	E5G97828	E5G97829	E5G97830
		2-1/4	5	E5G95921	E5G97831	E5G97832	E5G97833	E5G97834	E5G97835	E5G97836	E5G97837
		3-1/4	6	E5G95922	E5G97838	E5G97839	E5G97840	E5G97841	E5G97842	E5G97843	E5G97844
		4	6-1/4	E5G95923	E5G97845	E5G97846	E5G97847	E5G97848	E5G97849	E5G97850	E5G97851
1	1	1-1/4	3	E5G95064	E5G97064	E5G97852	E5G97853	E5G97854	E5G97855	E5G97856	E5G97857
		1-1/4	4	E5G95928	E5G97885	E5G97886	E5G97887	E5G97888	E5G97889	E5G97890	E5G97891
		2	5	E5G95924	E5G97858	E5G97859	E5G97860	E5G97861	E5G97862	E5G97863	E5G97864
		3-1/4	6	E5G95925	E5G97865	E5G97866	E5G97867	E5G97868	E5G97869	E5G97870	E5G97871
		4	7	E5G95926	E5G97872	E5G97873	E5G97874	E5G97875	E5G97876	E5G97877	E5G97878

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

ALU-POWER HPC END MILLS

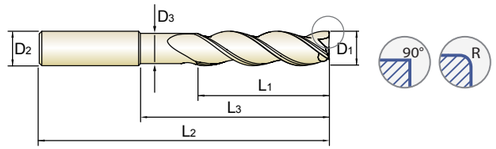
SQUARE **JAG96 SERIES**
CORNER RADIUS **JAG98 SERIES**

CARBIDE, 3 FLUTE EXTENDED LENGTH

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life

Square

Corner Radius



CARBIDE | 3 | 37° | PLAIN | DLC | p.C670

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia. (D_3)	Square End	Corner Radius						
							.010	.030	.060	.090	.120	.190	.250
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/4	1/4	3/8	3/4	2-1/2	.220	JAG96016	JAG98016	JAG98901	JAG98902				
		3/8	1-1/8	3	.220	JAG96901	JAG98903	JAG98904	JAG98905				
3/8	3/8	1/2	1-1/8	3	.345	JAG96024	JAG98024	JAG98906	JAG98907	JAG98908	JAG98909		
		1/2	2-1/8	4	.345	JAG96902	JAG98910	JAG98911	JAG98912	JAG98913	JAG98914		
1/2	1/2	5/8	1-3/8	3	.470	JAG96032	JAG98032	JAG98915	JAG98916	JAG98917	JAG98918	JAG98919	
		5/8	2-1/4	4	.470	JAG96903	JAG98920	JAG98921	JAG98922	JAG98923	JAG98924	JAG98925	
		5/8	3-3/8	5	.470	JAG96904	JAG98926	JAG98927	JAG98928	JAG98929	JAG98930	JAG98931	
		5/8	4-1/4	6	.470	JAG96905	JAG98932	JAG98933	JAG98934	JAG98935	JAG98936	JAG98937	
5/8	5/8	3/4	1-5/8	4	.585	JAG96040	JAG98040	JAG98938	JAG98939	JAG98940	JAG98941	JAG98942	
		3/4	3-3/8	6	.585	JAG96906	JAG98943	JAG98944	JAG98945	JAG98946	JAG98947	JAG98948	
3/4	3/4	1	2	4	.710	JAG96048	JAG98048	JAG98949	JAG98950	JAG98951	JAG98952	JAG98953	JAG98954
		1	3-3/8	6	.710	JAG96907	JAG98955	JAG98956	JAG98957	JAG98958	JAG98959	JAG98960	JAG98961
		1	5	7	.710	JAG96908	JAG98962	JAG98963	JAG98964	JAG98965	JAG98966	JAG98967	JAG98968
1	1	1-1/4	2-5/8	5	.960	JAG96064	JAG98064	JAG98969	JAG98970	JAG98971	JAG98972	JAG98973	JAG98974
		1-1/4	3-3/8	6	.960	JAG96909	JAG98975	JAG98976	JAG98977	JAG98978	JAG98979	JAG98980	JAG98981
		1-1/4	4-3/8	7	.960	JAG96910	JAG98982	JAG98983	JAG98984	JAG98985	JAG98986	JAG98987	JAG98988
		1-1/4	6	9	.960	JAG96911	JAG98989	JAG98990	JAG98991	JAG98992	JAG98993	JAG98994	JAG98995

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P																			M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron										
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended																													

ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41			
HRc											15	30	25	38	34			55	60	50	42	55			
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550			
Recommended	◎	◎	◎	◎	○	○	○	○	○																

ALU-POWER HPC END MILLS

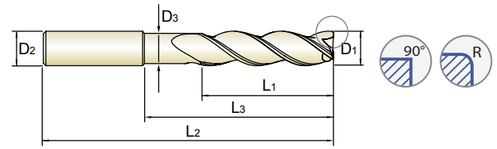
SQUARE **E5G96 SERIES**
CORNER RADIUS **E5G98 SERIES**

CARBIDE, 3 FLUTE EXTENDED LENGTH

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces

Square

Corner Radius



CARBIDE | 3 | 37° | PLAIN | UNCOATED | p.C670

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia. (D_3)	Square End	Corner Radius						
							.010	.030	.060	.090	.120	.190	.250
						EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.	EDP No.
1/4	1/4	3/8	3/4	2-1/2	.220	E5G96016	E5G98016	E5G98901	E5G98902				
		3/8	1-1/8	3	.220	E5G96901	E5G98903	E5G98904	E5G98905				
3/8	3/8	1/2	1-1/8	3	.345	E5G96024	E5G98024	E5G98906	E5G98907	E5G98908	E5G98909		
		1/2	2-1/8	4	.345	E5G96902	E5G98910	E5G98911	E5G98912	E5G98913	E5G98914		
1/2	1/2	5/8	1-3/8	3	.470	E5G96032	E5G98032	E5G98915	E5G98916	E5G98917	E5G98918	E5G98919	
		5/8	2-1/4	4	.470	E5G96903	E5G98920	E5G98921	E5G98922	E5G98923	E5G98924	E5G98925	
		5/8	3-3/8	5	.470	E5G96904	E5G98926	E5G98927	E5G98928	E5G98929	E5G98930	E5G98931	
		5/8	4-1/4	6	.470	E5G96905	E5G98932	E5G98933	E5G98934	E5G98935	E5G98936	E5G98937	
5/8	5/8	3/4	1-5/8	4	.585	E5G96040	E5G98040	E5G98938	E5G98939	E5G98940	E5G98941	E5G98942	
		3/4	3-3/8	6	.585	E5G96906	E5G98943	E5G98944	E5G98945	E5G98946	E5G98947	E5G98948	
3/4	3/4	1	2	4	.710	E5G96048	E5G98048	E5G98949	E5G98950	E5G98951	E5G98952	E5G98953	E5G98954
		1	3-3/8	6	.710	E5G96907	E5G98955	E5G98956	E5G98957	E5G98958	E5G98959	E5G98960	E5G98961
		1	5	7	.710	E5G96908	E5G98962	E5G98963	E5G98964	E5G98965	E5G98966	E5G98967	E5G98968
1	1	1-1/4	2-5/8	5	.960	E5G96064	E5G98064	E5G98969	E5G98970	E5G98971	E5G98972	E5G98973	E5G98974
		1-1/4	3-3/8	6	.960	E5G96909	E5G98975	E5G98976	E5G98977	E5G98978	E5G98979	E5G98980	E5G98981
		1-1/4	4-3/8	7	.960	E5G96910	E5G98982	E5G98983	E5G98984	E5G98985	E5G98986	E5G98987	E5G98988
		1-1/4	6	9	.960	E5G96911	E5G98989	E5G98990	E5G98991	E5G98992	E5G98993	E5G98994	E5G98995

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P																			M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron										
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended																													

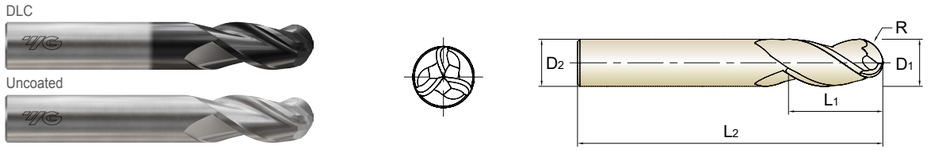
ISO	N										S							H						
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron		
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41			
HRc											15	30	25	38	34			55	60	50	42	55			
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550			
Recommended	◎	◎	◎	◎	○	○	○	○	○																

ALU-POWER HPC END MILLS

DLC **JAI58 SERIES**
UNCOATED **E5I58 SERIES**

CARBIDE, 3 FLUTE STANDARD LENGTH BALL NOSE

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life



CARBIDE | 3 | 37° | R ±.0005 | PLAIN | DLC | UNCOATED p.C671

Unit : Inch

Radius of Ball Nose R (±.0005)	OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Ball Nose DLC	Ball Nose Uncoated
1/16	1/8	1/8	1/4	1-1/2	JAI58008	E5I58008
1/16			3/8	1-1/2	JAI58901	E5I58901
3/32	3/16	3/16	5/16	2	JAI58012	E5I58012
3/32			9/16	2	JAI58902	E5I58902
1/8	1/4	1/4	3/8	2	JAI58016	E5I58016
1/8			5/8	2-1/2	JAI58903	E5I58903
5/32	5/16	5/16	5/8	2-1/2	JAI58020	E5I58020
5/32			1-1/4	3-1/2	JAI58904	E5I58904
3/16	3/8	3/8	1/2	2	JAI58024	E5I58024
3/16			1	2-1/2	JAI58905	E5I58905
3/16			1-1/2	3-1/2	JAI58906	E5I58906
7/32	7/16	7/16	9/16	2-1/2	JAI58028	E5I58028
7/32			1-1/4	2-3/4	JAI58907	E5I58907
1/4	1/2	1/2	5/8	2-1/2	JAI58032	E5I58032
1/4			1	3	JAI58908	E5I58908
1/4			1-5/8	4	JAI58909	E5I58909
1/4			2	4	JAI58910	E5I58910
5/16	5/8	5/8	3/4	3	JAI58040	E5I58040
5/16			1-5/8	3-1/2	JAI58911	E5I58911
5/16			2-1/2	5	JAI58912	E5I58912
3/8	3/4	3/4	1	3	JAI58048	E5I58048
3/8			1-5/8	4	JAI58913	E5I58913
1/2	1	1	1-1/4	4	JAI58064	E5I58064
1/2			2	5	JAI58914	E5I58914

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

ALU-POWER HPC END MILLS

DLC **JAI59 SERIES**
UNCOATED **E5I59 SERIES**

CARBIDE, 3 FLUTE EXTENTED LENGTH BALL NOSE

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- More efficient chip evacuation
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life

CARBIDE | 3 | 37° | R ±.0005 | PLAIN | DLC | UNCOATED p.C671

Unit : Inch

Radius of Ball Nose R (±.0005)	OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	OAL (L_2)	Neck Dia. (D_3)	Ball Nose DLC	Ball Nose Uncoated
3/16	3/8	3/8	1/2	2-1/8	4	.345	JAI59024	E5I59024
1/4	1/2	1/2	5/8	2-1/4	4	.470	JAI59032	E5I59032
1/4			5/8	3-3/8	5	.470	JAI59901	E5I59901
5/16	5/8	5/8	3/4	3-3/8	6	.585	JAI59040	E5I59040
3/8	3/4	3/4	1	2	4	.710	JAI59048	E5I59048
3/8			1	3-3/8	6	.710	JAI59902	E5I59902
3/8			1	5	7	.710	JAI59903	E5I59903
1/2	1	1	1-1/4	2-5/8	5	.960	JAI59064	E5I59064
1/2			1-1/4	3-3/8	6	.960	JAI59904	E5I59904
1/2			1-1/4	4-3/8	7	.960	JAI59905	E5I59905

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

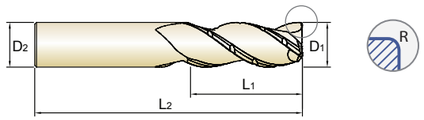
ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

ALU-POWER HPC END MILLS

CORNER RADIUS **JAI38 SERIES**

CARBIDE, 3 FLUTE STANDARD LENGTH - CHIP BREAKER

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- Chip Breaker Improves chip evacuation by shortening the chip length
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life



CARBIDE | 3 | 37° | PLAIN | DLC | p.C672

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Corner Radius .010 EDP No.	.030 EDP No.	.060 EDP No.	.120 EDP No.
1/8	1/8	1/4	1-1/2	JAI38008			
		3/8	1-1/2	JAI38901			
		1/2	2-1/2	JAI38902			
3/16	3/16	5/16	2	JAI38012			
		9/16	2	JAI38903	JAI38904		
1/4	1/4	3/8	2	JAI38016	JAI38905		
		5/8	2-1/2	JAI38906	JAI38907		
		1-1/4	3-1/4	JAI38908	JAI38909	JAI38910	
3/8	3/8	1/2	2	JAI38024	JAI38911		
		1	2-1/2	JAI38912	JAI38913	JAI38914	
		1-1/2	3-1/2	JAI38915	JAI38916	JAI38917	
		2	4			JAI38918	
1/2	1/2	5/8	2-1/2	JAI38032	JAI38919	JAI38920	
		1-1/4	3	JAI38921	JAI38922	JAI38923	
		1-5/8	4	JAI38924	JAI38925	JAI38926	
		2	4	JAI38927	JAI38928	JAI38929	
		2-1/2	5		JAI38930	JAI38931	
		3	5		JAI38932		
5/8	5/8	3/4	3			JAI38040	
		1-5/8	3-1/2			JAI38933	
		2-1/2	5		JAI38934		
3/4	3/4	1	3	JAI38048	JAI38935	JAI38936	
		1-5/8	4	JAI38937	JAI38938	JAI38939	JAI38940
		2-1/4	5		JAI38941	JAI38942	JAI38943
1	1	1-1/4	3	JAI38064			
		2	5	JAI38944	JAI38945	JAI38946	
		3-1/4	6	JAI38947			

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

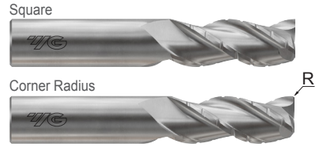
ALU-POWER HPC END MILLS

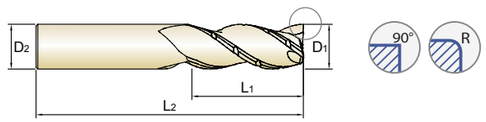
SQUARE **E5I36 SERIES**

CORNER RADIUS **E5I38 SERIES**

CARBIDE, 3 FLUTE STANDARD LENGTH - CHIP BREAKER

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- Chip Breaker Improves chip evacuation by shortening the chip length
- Ability to counteract extreme radial forces





CARBIDE | 3 | 37° | PLAIN | UNCOATED | p.C672

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	OAL (L_2)	Square End EDP No.	Corner Radius .010 EDP No.	.030 EDP No.	.060 EDP No.	.120 EDP No.
1/8	1/8	1/4	1-1/2		E5I38008			
		3/8	1-1/2		E5I38901			
		1/2	2-1/2		E5I38902			
3/16	3/16	5/16	2		E5I38012			
		9/16	2		E5I38903	E5I38904		
1/4	1/4	3/8	2		E5I38016	E5I38905		
		5/8	2-1/2		E5I38906	E5I38907		
		1-1/4	3-1/4		E5I38908	E5I38909	E5I38910	
3/8	3/8	1/2	2		E5I38024	E5I38911		
		1	2-1/2		E5I38912	E5I38913	E5I38914	
		1-1/2	3-1/2		E5I38915	E5I38916	E5I38917	
		2	4				E5I38918	
1/2	1/2	5/8	2-1/2		E5I38032	E5I38919	E5I38920	
		1-1/4	3	E5I36032	E5I38921	E5I38922	E5I38923	
		1-5/8	4		E5I38924	E5I38925	E5I38926	
		2	4	E5I36901	E5I38927	E5I38928	E5I38929	
		2-1/2	5			E5I38930	E5I38931	
		3	5	E5I36902		E5I38932		
5/8	5/8	3/4	3	E5I36040			E5I38040	
		1-5/8	3-1/2				E5I38933	
		2-1/2	5			E5I38934		
3/4	3/4	1	3	E5I36048	E5I38048	E5I38935	E5I38936	
		1-5/8	4	E5I36903	E5I38937	E5I38938	E5I38939	E5I38940
		2-1/4	5			E5I38941	E5I38942	E5I38943
1	1	1-1/4	3		E5I38064			
		2	5		E5I38944	E5I38945	E5I38946	
		3-1/4	6		E5I38947			

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

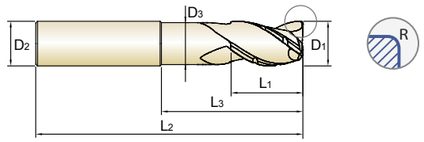
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

ALU-POWER HPC END MILLS

CORNER RADIUS **JAI39 SERIES**

CARBIDE, 3 FLUTE EXTENDED LENGTH - CHIP BREAKER

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- Chip Breaker Improves chip evacuation by shortening the chip length
- Ability to counteract extreme radial forces
- DLC Coating provides edge strength and unsurpassed tool life



CARBIDE | 3 | 37° | PLAIN | DLC | p.C672

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	Neck Dia. (D_3)	OAL (L_2)	Corner Radius .010 EDP No.	Corner Radius .030 EDP No.	Corner Radius .060 EDP No.
1/4	1/4	3/8	3/4	.220	2-1/2	JAI39016		
3/8	3/8	1/2	1-1/8	.345	3		JAI39024	
		1/2	2-1/8	.345	4		JAI39901	
1/2	1/2	5/8	1-3/8	.470	3		JAI39032	JAI39902
		5/8	2-1/4	.470	4		JAI39903	JAI39904
		5/8	3-3/8	.470	5		JAI39905	JAI39906
		5/8	4-1/4	.470	6	JAI39907	JAI39908	JAI39909
3/4	3/4	1	2	.710	4		JAI39048	JAI39910
		1	3-3/8	.710	6		JAI39911	JAI39912
		1	5	.710	7		JAI39913	JAI39914
1	1	1-1/4	4-3/8	.960	7	JAI39064		

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

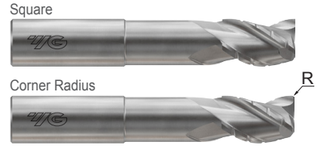
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

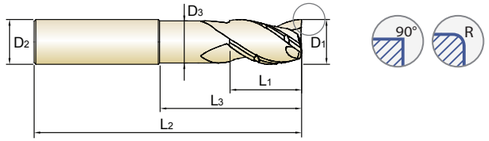
ALU-POWER HPC END MILLS

SQUARE **E5I37 SERIES**
CORNER RADIUS **E5I39 SERIES**

CARBIDE, 3 FLUTE EXTENDED LENGTH - CHIP BREAKER

- Balanced cutting with less vibration
- Ability to run at higher speeds with less heat in aluminum
- Chip Breaker Improves chip evacuation by shortening the chip length
- Ability to counteract extreme radial forces





CARBIDE | 3 | 37° | PLAIN | UNCOATED | p.C672

Unit : Inch

OD (D_1)	SD (D_2)	LOC (L_1)	LBS (L_3)	Neck Dia. (D_3)	OAL (L_2)	Square End EDP No.	Corner Radius .010 EDP No.	Corner Radius .030 EDP No.	Corner Radius .060 EDP No.
1/4	1/4	3/8	3/4	.220	2-1/2		E5I39016		
3/8	3/8	1/2	1-1/8	.345	3			E5I39024	
		1/2	2-1/8	.345	4			E5I39901	
1/2	1/2	5/8	1-3/8	.470	3	E5I37032		E5I39032	E5I39902
		5/8	2-1/4	.470	4	E5I37901		E5I39903	E5I39904
		5/8	3-3/8	.470	5			E5I39905	E5I39906
		5/8	4-1/4	.470	6		E5I39907	E5I39908	E5I39909
3/4	3/4	1	2	.710	4			E5I39048	E5I39910
		1	3-3/8	.710	6			E5I39911	E5I39912
		1	5	.710	7			E5I39913	E5I39914
1	1	1-1/4	4-3/8	.960	7		E5I39064		

Outside Diameter Tolerences (inch)		Shank Dimeter Tolerance
Diameter	Tolerance	
1/8 – 3/16	+0/-.00032	h6
1/4 – 3/8	+0/-.00035	
1/2 – 5/8	+0/-.00043	
3/4 – 1	+0/-.00051	

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	◎	◎	◎	◎	○	○	○	○	○													

ALU-POWER HPC END MILLS

RECOMMENDED CUTTING CONDITIONS

JAG95, JAG97, JAG96, JAG98 SERIES — DLC
E5G95, E5G97, E5G96, E5G98 SERIES — Uncoated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	1.0D	1.0D	SFM(Vc)	2000	2000	2000	2000	2000	2000	2000
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	61100	30500	20400	15300	12200	10200	7600
						IPM(FEED)	183	275	275	275	242	230	228
	23-25	Aluminum-cast, alloyed	75 / 90 / 130	1.0D	1.0D	SFM(Vc)	600	600	600	600	600	600	600
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	18340	9170	6110	4580	3670	3060	2290
						IPM(FEED)	55	83	83	83	73	69	69
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	1.0D	1.0D	SFM(Vc)	880	880	880	880	880	880	880
						IPT(fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	26890	13450	8960	6720	5380	4480	3360
						IPM (FEED)	65	81	108	101	89	81	71
	29.1	Non Metallic Materials (Duroplastic)	-	1.0D	1.0D	SFM(Vc)	1670	1670	1670	1670	1670	1670	1670
						IPT(fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	51040	25520	17010	12760	10210	8510	6380
						IPM(FEED)	230	306	383	383	337	306	268

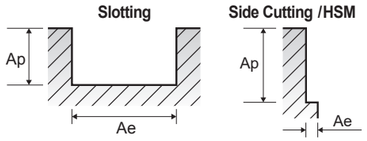
3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	0.5D	1.5D	SFM(Vc)	3000	3000	3000	3000	3000	3000	3000
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	91700	45800	30600	23000	18300	15300	11500
						IPM(FEED)	275	412	413	414	362	344	345
	23-25	Aluminum-cast, alloyed	75 / 130	0.5D	1.5D	SFM(Vc)	800	800	800	800	800	800	800
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	24450	12220	8150	6110	4890	4080	3060
						IPM(FEED)	73	110	110	110	97	92	92
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	0.5D	1.5D	SFM(Vc)	1150	1150	1150	1150	1150	1150	1150
						IPT(fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	35140	17570	11720	8790	7030	5860	4390
						IPM (FEED)	84	105	141	132	116	105	92
	29.1	Non Metallic Materials (Duroplastic)	-	0.5D	1.5D	SFM(Vc)	2070	2070	2070	2070	2070	2070	2070
						IPT(fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	63260	31630	21090	15820	12650	10540	7910
						IPM(FEED)	285	380	474	474	418	380	332

3 FLUTE - SIDE CUTTING HSM (Light)

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	0.05D	2.0D	SFM(Vc)	8000	8000	8000	8000	8000	8000	8000
						IPT(fz)	.0021	.0055	.0105	.0140	.0150	.0165	.0195
						RPM	244500	122200	81500	61100	48900	40700	30600
						IPM(FEED)	1540	2016	2567	2566	2201	2015	1790
	23-25	Aluminum-cast, alloyed	75 /130	0.05D	2.0D	SFM(Vc)	1200	1200	1200	1200	1200	1200	1200
						IPT(fz)	.0021	.0055	.0105	.0140	.0150	.0165	.0195
						RPM	36670	18340	12220	9170	7330	6110	4580
						IPM(FEED)	231	303	385	385	330	303	268
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	0.05D	2.0D	SFM(Vc)	1850	1850	1850	1850	1850	1850	1850
						IPT(fz)	.0017	.0045	.0085	.0115	.0130	.0140	.0160
						RPM	56540	28270	18850	14130	11310	9420	7070
						IPM (FEED)	288	382	481	488	441	396	339
	29.1	Non Metallic Materials (Duroplastic)	-	0.05D	2.0D	SFM(Vc)	3350	3350	3350	3350	3350	3350	3350
						IPT(fz)	.0034	.0090	.0170	.0230	.0250	.0275	.0320
						RPM	102380	51190	34130	25590	20480	17060	12800
						IPM(FEED)	1044	1382	1740	1766	1536	1408	1229

NOTES:
- All cutting data are target values
- Maximum recommended depth shown
- Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D or less
- Reduce speed and feed recommendations for materials harder than listed
- Reduce cut depth and feed by 50% for long-flute or long-reach tools
- Above recommendations are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions
- HSM = high-speed machining



ALU-POWER HPC END MILLS

RECOMMENDED CUTTING CONDITIONS

JAI58, JAI59 SERIES — DLC
E5I58, E5I59 SERIES — Uncoated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE - PROFILING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	0.2D	0.1D	SFM(Vc)	3690	3690	3690	3690	3690	3690	3690
						IPT(fz)	.0013	.0025	.0038	.0050	.0063	.0075	.0100
						RPM	112770	56380	37590	28190	22550	18790	14100
						IPM(FEED)	440	423	429	423	426	423	423
	23-25	Aluminum-cast, alloyed	75 / 90 / 130	0.2D	0.1D	SFM(Vc)	2950	2950	2950	2950	2950	2950	2950
						IPT(fz)	.0010	.0020	.0030	.0040	.0050	.0060	.0080
						RPM	90150	45080	30050	22540	18030	15030	11270
						IPM(FEED)	270	270	270	270	270	271	270
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	0.2D	0.1D	SFM(Vc)	1700	1700	1700	1700	1700	1700	1700
						IPT(fz)	.0009	.0018	.0026	.0035	.0044	.0053	.0070
						RPM	51950	25980	17320	12990	10390	8660	6490
						IPM (FEED)	140	140	135	136	137	138	136
	29.1	Non Metallic Materials (Duroplastic)	-	0.2D	0.1D	SFM(Vc)	1840	1840	1840	1840	1840	1840	1840
						IPT(fz)	.0011	.0023	.0034	.0045	.0056	.0068	.0090
						RPM	56230	28120	18740	14060	11250	9370	7030
						IPM(FEED)	186	194	191	190	189	191	190

NOTES:
- All cutting data are target values
- Maximum recommended depth shown
- Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D or less
- Reduce speed and feed recommendations for materials harder than listed
- Reduce cut depth and feed by 50% for long-flute or long-reach tools
- Above recommendations are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions

Tech Tip : The tables above are based on common machining calculations.
We realize that shops may not have RPM capability shown in the tables
To adapt the tables to machining conditions available, use the following calculation:
(Recommended Feed (IPM) / Recommended RPM) X Available RPM = IPM
Example for 1/8" Side Milling in N21-22 WorkPiece Materials:
(440 IPM /112770 RPM) X 15,000=58 IPM

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

ALU-POWER HPC END MILLS

RECOMMENDED CUTTING CONDITIONS

JAI38, JAI39 SERIES DLC

E5I36, E5I38, E5I37, E5I39 SERIES Uncoated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE CHIP BREAKER - SLOTTING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	1.0D	1.0D	SFM(Vc)	2000	2000	2000	2000	2000	2000	2000
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	61100	30500	20400	15300	12200	10200	7600
						IPM(FEED)	183	275	275	275	242	230	228
	23-25	Aluminum-cast, alloyed	75 /130	1.0D	1.0D	SFM(Vc)	600	600	600	600	600	600	600
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	18340	9170	6110	4580	3670	3060	2290
						IPM(FEED)	55	83	83	83	73	69	69
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	1.0D	1.0D	SFM(Vc)	880	880	880	880	880	880	880
						IPT(fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	26890	13450	8960	6720	5380	4480	3360
						IPM (FEED)	65	81	108	101	89	81	71
	29.1	Non Metallic Materials (Duroplastic)	-	1.0D	1.0D	SFM(Vc)	1670	1670	1670	1670	1670	1670	1670
						IPT(fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	51040	25520	17010	12760	10210	8510	6380
						IPM(FEED)	230	306	383	383	337	306	268

3 FLUTE CHIP BREAKER - SIDE CUTTING

ISO	VDI 3323	Material Description	Hardness (HB)	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	1
N	21-22	Aluminum-wrought alloy	60 / 100	0.5D	1.5D	SFM(Vc)	3000	3000	3000	3000	3000	3000	3000
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	91700	45800	30600	23000	18300	15300	11500
						IPM(FEED)	275	412	413	414	362	344	345
	23-25	Aluminum-cast, alloyed	75 /130	0.5D	1.5D	SFM(Vc)	800	800	800	800	800	800	800
						IPT(fz)	.0010	.0030	.0045	.0060	.0066	.0075	.0100
						RPM	24450	12220	8150	6110	4890	4080	3060
						IPM(FEED)	73	110	110	110	97	92	92
	26-28	Copper and Copper Alloys (Bronze / Brass)	110 / 90 / 100	0.5D	1.5D	SFM(Vc)	1150	1150	1150	1150	1150	1150	1150
						IPT(fz)	.0008	.0020	.0040	.0050	.0055	.0060	.0070
						RPM	35140	17570	11720	8790	7030	5860	4390
						IPM (FEED)	84	105	141	132	116	105	92
	29.1	Non Metallic Materials (Duroplastic)	-	0.5D	1.5D	SFM(Vc)	2070	2070	2070	2070	2070	2070	2070
						IPT(fz)	.0015	.0040	.0075	.0100	.0110	.0120	.0140
						RPM	63260	31630	21090	15820	12650	10540	7910
						IPM(FEED)	285	380	474	474	418	380	332

NOTES:
- All cutting data are target values
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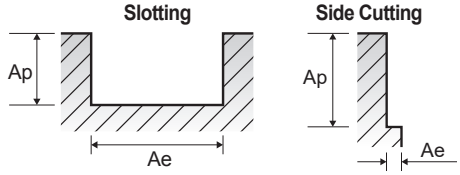
- HSM = high-speed machining

Tech Tip : The tables above are based on common machining calculations.
We realize that shops may not have RPM capability shown in the tables
To adapt the tables to machining conditions available, use the following calculation:
(Recommended Feed (IPM) / Recommended RPM) X Available RPM = IPM
Example for 1/8" Side Milling in N21-22 WorkPiece Materials:
(275 IPM / 91700 RPM) X 15,000 = 45 IPM



Leading Through Innovation

SOLID CARBIDE & HSS-PM

ALU-POWER END MILLS

- For Aluminium Alloys and Silent Cutting

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE & HSS-PM

ALU POWER END MILLS

For Aluminium Alloys and Silent Cutting

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C706

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SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE & HSS-PM

ALU POWER END MILLS

For Aluminium Alloys and Silent Cutting

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◎ : Excellent ○ : Good

Recommended cutting conditions : p.C706

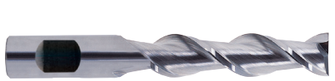
| | | |

ALU-POWER END MILLS

FLAT SHANK **E5253** SERIES

CARBIDE, 2 FLUTE 42° HELIX REGULAR LENGTH - "BANSHEE"

- High velocity milling of aluminum & other non ferrous materials.
- Excellent plunging capabilities.
- Improved surface roughness-cylindrical margin which is controlled tightly.
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.



CARBIDE | 2 | 42° | FLAT | TiCN | UNCOATED

p.C706

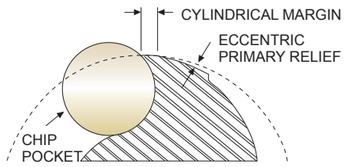
◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
17574	17574TC	1/4	3/8	3/4	2-1/2
17580	17580TC	5/16	3/8	13/16	2-1/2
17584	17584TC	3/8	3/8	1	2-1/2
17593	17593TC	1/2	1/2	1	3
18593	18593TC	1/2	1/2	2	4
17901	17901TC	1/2	1/2	1-1/4	3-1/4
17595	17595TC	5/8	5/8	1-1/4	3-1/2
17598	17598TC	3/4	3/4	1-1/2	4
18598	18598TC	3/4	3/4	3	5-1/2
17600	17600TC	1	1	1-1/2	4
18600	18600TC	1	1	3	5-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(42°), bigger chip pocket.



◎ : Excellent ○ : Good

ISO	P																			M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel										Stainless steel			Grey cast iron			Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended																													

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

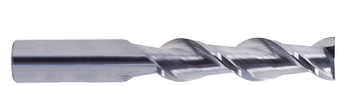
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL
INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

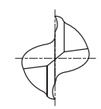
ALU-POWER END MILLS

PLAIN SHANK **E5254** SERIES

CARBIDE, 2 FLUTE 42° HELIX REGULAR LENGTH - "BANSHEE"

- High velocity milling of aluminum & other non ferrous materials.
- Excellent plunging capabilities.
- Improved surface roughness-cylindrical margin which is controlled tightly.
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.





CARBIDE | 2 | 42° | PLAIN | TiCN | UNCOATED

p.C706

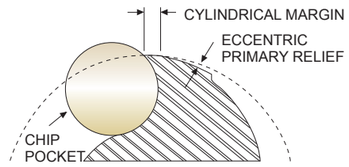
◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
21554	21554TC	1/16	1/8	1/8	1-1/2
21556	21556TC	3/32	1/8	1/4	1-1/2
21601	21601TC	1/8	1/4	5/16	1-3/4
21566	21566TC	3/16	1/4	7/16	2
21574	21574TC	1/4	3/8	3/4	2-1/2
21580	21580TC	5/16	3/8	13/16	2-1/2
21584	21584TC	3/8	3/8	1	2-1/2
21588	21588TC	7/16	7/16	1	2-3/4
21593	21593TC	1/2	1/2	1	3
21904	21904TC	1/2	1/2	1-1/4	3
21901	21901TC	1/2	1/2	2	4
21595	21595TC	5/8	5/8	1-1/4	3-1/2
21598	21598TC	3/4	3/4	1-1/2	4
21902	21902TC	3/4	3/4	3	5-1/2
21600	21600TC	1	1	1-1/2	4
21903	21903TC	1	1	3	5-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(42°), bigger chip pocket.



◎ : Excellent ○ : Good

ISO	P																			M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel										Stainless steel			Grey cast iron			Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended																													

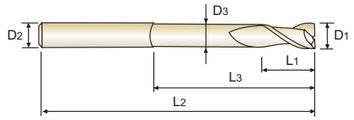
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLANE SHANK **E5976** SERIES

CARBIDE, 2 FLUTE 37° HELIX with EXTENDED NECK

- High velocity milling of aluminum & other non-ferrous materials.
- Excellent plunging capabilities.
- Improved surface roughness-cylindrical margin which is controlled tightly.
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.



CARBIDE | 2 | 37° | PLAIN | TiCN | UNCOATED

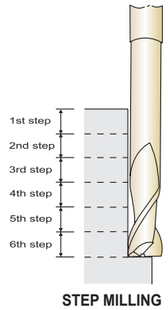
p.C709

◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	D1	D2	L1	L3	L2	D3
39573	39573TC	1/4	1/4	3/8	2-1/4	4	.220
39584	39584TC	3/8	3/8	1/2	2-1/4	4	.345
39593	39593TC	1/2	1/2	5/8	2-1/4	5	.470
39908	39908TC	1/2	1/2	5/8	3-1/4	6	.470
39901	39901TC	1/2	1/2	5/8	4	6	.470
39595	39595TC	5/8	5/8	3/4	2-1/4	5	.585
39902	39902TC	5/8	5/8	3/4	3-1/4	6	.585
39903	39903TC	5/8	5/8	3/4	4-1/4	7	.585
39598	39598TC	3/4	3/4	1	2-1/4	5	.710
39904	39904TC	3/4	3/4	1	3-1/4	6	.710
39905	39905TC	3/4	3/4	1	4-1/4	7	.710
39600	39600TC	1	1	1-1/8	2-1/4	5	.960
39906	39906TC	1	1	1-1/8	3-1/4	6	.960
39907	39907TC	1	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003



STEP MILLING

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5980** SERIES

CARBIDE, 3 FLUTE 45° HELIX STUB LENGTH

- Designed to machine aluminium at high speed condition.
- Improved surface roughness-cylindrical margin which is controlled tightly.
- Mirror face-excellent surface finish.

CARBIDE | 3 | 45° | PLAIN | TiCN | UNCOATED

p.C707

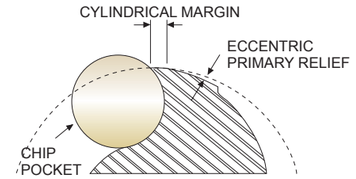
◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED				
25558	25558TC	1/8	1/8	1/4	1-1/2
25565	25565TC	3/16	3/16	5/16	2
25573	25573TC	1/4	1/4	3/8	2
25579	25579TC	5/16	5/16	7/16	2
25584	25584TC	3/8	3/8	1/2	2
25588	25588TC	7/16	7/16	9/16	2-1/2
25593	25593TC	1/2	1/2	5/8	2-1/2
25595	25595TC	5/8	5/8	3/4	3
25598	25598TC	3/4	3/4	1	3
25600	25600TC	1	1	1-1/4	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003

- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(45°), bigger chip pocket.



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

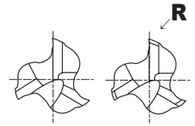
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

YG ALU-POWER END MILLS

PLAIN SHANK **E5981** SERIES
PLAIN SHANK **E5983** SERIES

CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH & CORNER RADIUS

- High velocity milling of aluminum & other non-ferrous materials.
- 3flute and 45° helix allow harmonic balance at high speed condition and smooth cutting.
- Improved surface roughness-cylindrical margin which is controlled tightly
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.



CARBIDE | 3 | 45° | PLAIN | TiCN | UNCOATED

p.C707

◆ U.S.A Stock

■ SQUARE

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED				
28558	**28558TC**	**1/8**	1/8	3/8	1-1/2
28565	**28565TC**	**3/16**	3/16	9/16	2
28573	**28573TC**	**1/4**	1/4	5/8	2-1/2
28579	**28579TC**	**5/16**	5/16	5/8	2-1/2
28584	**28584TC**	**3/8**	3/8	1	2-1/2
28588	**28588TC**	**7/16**	7/16	1-1/4	2-3/4
28593	**28593TC**	**1/2**	1/2	1-1/4	3
28595	**28595TC**	**5/8**	5/8	1-5/8	3-1/2
28598	**28598TC**	**3/4**	3/4	1-5/8	4
28600	**28600TC**	**1**	1	2	5

■ CORNER RADIUS

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED	R				
EA50321	**EA50321C**	R.060	**1/2**	1/2	1-1/4	3
EA50401	**EA50401C**	R.060	**5/8**	5/8	1-5/8	3-1/2
EA50481	**EA50481C**	R.060	**3/4**	3/4	1-5/8	4
EA50641	**EA50641C**	R.065	**1**	1	2	5
EA20321	**EA20321C**	R.120	**1/2**	1/2	1-1/4	3
EA20401	**EA20401C**	R.120	**5/8**	5/8	1-5/8	3-1/2
EA20481	**EA20481C**	R.120	**3/4**	3/4	1-5/8	4
EA20641	**EA20641C**	R.120	**1**	1	2	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

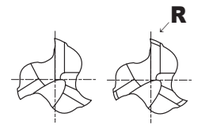
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

YG ALU-POWER END MILLS

PLAIN SHANK **E5982** SERIES
PLAIN SHANK **E5984** SERIES

CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH & CORNER RADIUS

- High velocity milling of aluminum & other non-ferrous materials.
- 3flute and 45° helix allow harmonic balance at high speed condition and smooth cutting.
- Improved surface roughness-cylindrical margin which is controlled tightly
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.



CARBIDE | 3 | 45° | PLAIN | TiCN | UNCOATED

p.C707

◆ U.S.A Stock

■ SQUARE

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED				
36573	**36573TC**	**1/4**	1/4	1-1/4	3-1/4
36579	**36579TC**	**5/16**	5/16	1-1/4	3-1/2
36584	**36584TC**	**3/8**	3/8	1-1/2	3-1/2
36588	**36588TC**	**7/16**	7/16	2	4
36593	**36593TC**	**1/2**	1/2	2	4
36595	**36595TC**	**5/8**	5/8	2-1/2	5
36598	**36598TC**	**3/4**	3/4	3-1/4	6
36600	**36600TC**	**1**	1	3-1/4	6

■ CORNER RADIUS

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED	R				
EA60321	**EA60321C**	R.060	**1/2**	1/2	2	4
EA60401	**EA60401C**	R.060	**5/8**	5/8	2-1/2	5
EA60481	**EA60481C**	R.060	**3/4**	3/4	3-1/4	6
EA60641	**EA60641C**	R.060	**1**	1	3-1/4	6
EA30321	**EA30321C**	R.120	**1/2**	1/2	2	4
EA30401	**EA30401C**	R.120	**5/8**	5/8	2-1/2	5
EA30481	**EA30481C**	R.120	**3/4**	3/4	3-1/4	6
EA30641	**EA30641C**	R.120	**1**	1	3-1/4	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

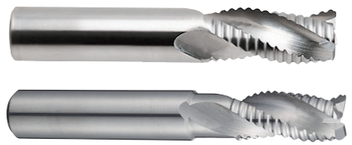
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

YG ALU-POWER END MILLS

PLAIN SHANK **E5E44** SERIES
PLAIN SHANK **E5E98** SERIES

CARBIDE, 3 FLUTE ROUGHING & ROUGHING with NECK

- Excellent cutting qualities on aluminum, copper
- Increased tool life and superior chip evacuation
- Reduces chipping of corner edges



* WITH NECK

CARBIDE | 3 | 30° | PLAIN | UNCOATED | p.C713

◆ U.S.A Stock

■ ROUGHING

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
44016	1/4	1/4	3/4	2-1/2
44024	3/8	3/8	7/8	2-1/2
44032	1/2	1/2	1	3
44040	5/8	5/8	1-1/4	3-1/2
44048	3/4	3/4	1-5/8	4
44064	1	1	1-3/4	4

■ ROUGHING with NECK

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
98016	1/4	1/4	3/4	1	2-1/2	.210
98024	3/8	3/8	7/8	1-1/4	3	.335
98032	1/2	1/2	1	1-3/8	3-1/4	.440
98040	5/8	5/8	1-1/4	1-3/4	3-3/4	.565
98048	3/4	3/4	1-5/8	2-1/4	4-1/2	.690
98064	1	1	1-3/4	2-1/2	5	.940

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

YG ALU-POWER END MILLS

PLAIN SHANK **E5E45** SERIES

CARBIDE, 3 FLUTE ROUGHING BALL NOSE

- Excellent cutting qualities on aluminum, copper
- Increased tool life and superior chip evacuation
- Reduces chipping of corner edges

CARBIDE | 3 | 30° | PLAIN | UNCOATED | p.C713

◆ U.S.A Stock

Unit : Inch

SAB CODE	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
45016	1/4	1/4	3/4	2-1/2	3
45024	3/8	3/8	7/8	2-1/2	3
45032	1/2	1/2	1	3	3
45040	5/8	5/8	1-1/4	3-1/2	3
45048	3/4	3/4	1-5/8	4	3
45064	1	1	1-3/4	4	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5977** SERIES

CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK

- High velocity milling of aluminum & other non-ferrous materials.
- 3flute and 37° helix allow harmonic balance at high speed condition and smooth cutting.
- Improved surface roughness-cylindrical margin which is controlled tightly.
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.

CARBIDE | 3 | 37° | PLAIN | TiCN | UNCOATED

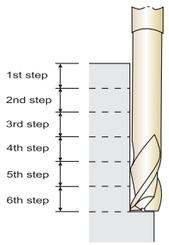
p.C708

◆ U.S.A Stock

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	D_1	D_2	L_1	L_3	L_2	D_3
40573	**40573TC**	**1/4**	1/4	3/8	2-1/4	4	.220
40584	**40584TC**	**3/8**	3/8	1/2	2-1/4	4	.345
40593	**40593TC**	**1/2**	1/2	5/8	2-1/4	5	.470
40901	**40901TC**	**1/2**	1/2	5/8	3-1/4	6	.470
40902	**40902TC**	**1/2**	1/2	5/8	4	6	.470
40595	**40595TC**	**5/8**	5/8	3/4	2-1/4	5	.585
40903	**40903TC**	**5/8**	5/8	3/4	3-1/4	6	.585
40904	**40904TC**	**5/8**	5/8	3/4	4-1/4	7	.585
40598	**40598TC**	**3/4**	3/4	1	2-1/4	5	.710
40905	**40905TC**	**3/4**	3/4	1	3-1/4	6	.710
40906	**40906TC**	**3/4**	3/4	1	4-1/4	7	.710
40600	**40600TC**	**1**	1	1-1/8	2-1/4	5	.960
40907	**40907TC**	**1**	1	1-1/8	3-1/4	6	.960
40908	**40908TC**	**1**	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003



STEP MILLING

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5985** SERIES

CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK CORNER RADIUS

- High velocity milling of aluminum & other non-ferrous materials.
- 3flute and 37° helix allow harmonic balance at high speed condition and smooth cutting.
- Improved surface roughness-cylindrical margin which is controlled tightly.
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.

CARBIDE | 3 | 37° | PLAIN | TiCN | UNCOATED

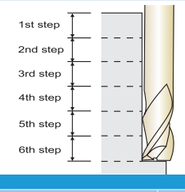
p.C708

◆ U.S.A Stock

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R	D_1	D_2	L_1	L_3	L_2	D_3
EA40321	**EA40321C**	R.060	**1/2**	1/2	5/8	3-1/4	6	.470
EA40322	**EA40322C**	R.060	**1/2**	1/2	5/8	4	6	.470
EA40401	**EA40401C**	R.060	**5/8**	5/8	3/4	2-1/4	5	.585
EA40402	**EA40402C**	R.060	**5/8**	5/8	3/4	3-1/4	6	.585
EA40403	**EA40403C**	R.060	**5/8**	5/8	3/4	4-1/4	7	.585
EA40481	**EA40481C**	R.060	**3/4**	3/4	1	2-1/4	5	.710
EA40482	**EA40482C**	R.060	**3/4**	3/4	1	3-1/4	6	.710
EA40483	**EA40483C**	R.060	**3/4**	3/4	1	4-1/4	7	.710
EA40641	**EA40641C**	R.060	**1**	1	1-1/8	2-1/4	5	.960
EA40642	**EA40642C**	R.060	**1**	1	1-1/8	3-1/4	6	.960
EA40643	**EA40643C**	R.060	**1**	1	1-1/8	4-1/4	7	.960
EA10321	**EA10321C**	R.120	**1/2**	1/2	5/8	3-1/4	6	.470
EA10322	**EA10322C**	R.120	**1/2**	1/2	5/8	4	6	.470
EA10401	**EA10401C**	R.120	**5/8**	5/8	3/4	2-1/4	5	.585
EA10402	**EA10402C**	R.120	**5/8**	5/8	3/4	3-1/4	6	.585
EA10403	**EA10403C**	R.120	**5/8**	5/8	3/4	4-1/4	7	.585
EA10481	**EA10481C**	R.120	**3/4**	3/4	1	2-1/4	5	.710
EA10482	**EA10482C**	R.120	**3/4**	3/4	1	3-1/4	6	.710
EA10483	**EA10483C**	R.120	**3/4**	3/4	1	4-1/4	7	.710
EA10641	**EA10641C**	R.120	**1**	1	1-1/8	2-1/4	5	.960
EA10642	**EA10642C**	R.120	**1**	1	1-1/8	3-1/4	6	.960
EA10643	**EA10643C**	R.120	**1**	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0005	0~-.0003



STEP MILLING

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

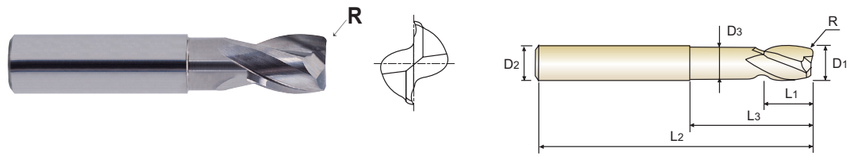
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5973** SERIES

CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- Excellent cutting qualities on stainless steel, aluminum, copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.



CARBIDE | 2 | 30° | R ±.001 | PLAIN | TiCN | UNCOATED

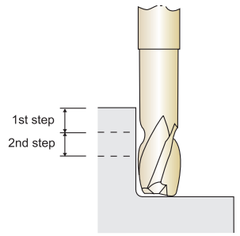
p.C709

◆ U.S.A Stock

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R	D1	D2	L1	L3	L2	D3
24562	**24562TC**	R.012	**5/32**	1/4	3/16	3/8	2	.140
24573	**24573TC**	R.020	**1/4**	1/4	5/16	3/4	2-3/8	.226
24579	**24579TC**	R.024	**5/16**	5/16	3/8	1-1/8	2-3/4	.282
24584	**24584TC**	R.031	**3/8**	3/8	1/2	1-1/2	3-1/8	.336
24593	**24593TC**	R.040	**1/2**	1/2	9/16	1-1/2	3-1/2	.460
24595	**24595TC**	R.051	**5/8**	5/8	3/4	1-3/4	4	.566
24598	**24598TC**	R.063	**3/4**	3/4	1	1-3/4	4	.670

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003



STEP MILLING

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

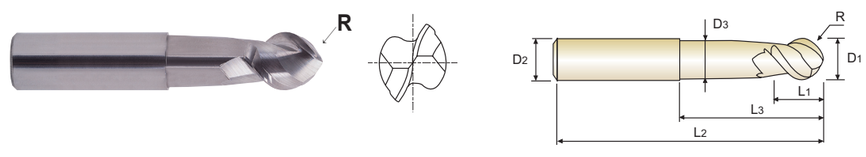
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5974** SERIES

CARBIDE, 2 FLUTE 50° HELIX STUB CUT LENGTH BALL NOSE with NECK

- Excellent cutting qualities on stainless steel, aluminum, copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.



CARBIDE | 2 | 50° | R ±.0005 | PLAIN | TiCN | UNCOATED

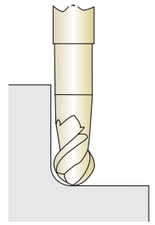
p.C710

◆ U.S.A Stock

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R (±.0005)	D1	D2	L1	L3	L2	D3
37573	**37573TC**	R1/8	**1/4**	1/4	7/32	1	2-1/4	.226
37579	**37579TC**	R5/32	**5/16**	5/16	9/32	1-1/8	2-1/2	.280
37584	**37584TC**	R3/16	**3/8**	3/8	11/32	1-3/8	3	.335
37593	37593TC	R1/4	**1/2**	1/2	13/32	1-1/2	3	.460
37595	**37595TC**	R5/16	**5/8**	5/8	9/16	2	3-1/2	.566
37598	**37598TC**	R3/8	**3/4**	3/4	11/16	2	4	.671

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0010	0~-.0003



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

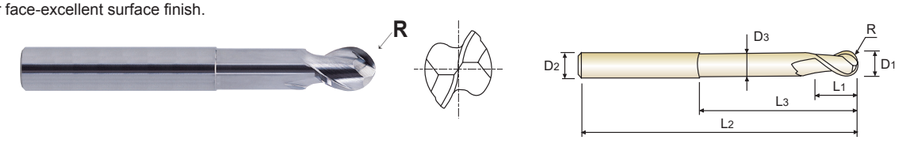
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5978** SERIES

CARBIDE, 2 FLUTE 37° HELIX LONG REACH BALL NOSE

- High velocity milling of aluminum & other non-ferrous materials.
- Extended neck design which is suitable for step milling.
- Improved surface roughness-cylinderical margin which is controlled tightly
- Maximum-metal removal rate.
- Superior chip evacuation.
- Mirror face-excellent surface finish.



CARBIDE | 2 | 37° | R ±.001 | PLAIN | TiCN | UNCOATED

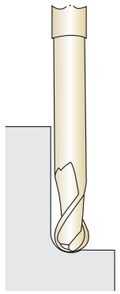
p.C710

◆ U.S.A Stock

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R (±.001)	D1	D2	L1	L3	L2	D3
89573	**89573TC**	R1/8	**1/4**	1/4	3/8	2-1/4	4	.220
89584	**89584TC**	R3/16	**3/8**	3/8	1/2	2-1/4	4	.345
89593	**89593TC**	R1/4	**1/2**	1/2	5/8	2-1/4	5	.470
89901	**89901TC**	R1/4	**1/2**	1/2	5/8	3-1/4	6	.470
89902	**89902TC**	R1/4	**1/2**	1/2	5/8	4	6	.470
89595	**89595TC**	R5/16	**5/8**	5/8	3/4	2-1/4	5	.585
89903	**89903TC**	R5/16	**5/8**	5/8	3/4	3-1/4	6	.585
89904	**89904TC**	R5/16	**5/8**	5/8	3/4	4-1/4	7	.585
89598	**89598TC**	R3/8	**3/4**	3/4	1	2-1/4	5	.710
89905	**89905TC**	R3/8	**3/4**	3/4	1	3-1/4	6	.710
89906	**89906TC**	R3/8	**3/4**	3/4	1	4-1/4	7	.710
89600	**89600TC**	R1/2	**1**	1	1-1/8	2-1/4	5	.960
89907	**89907TC**	R1/2	**1**	1	1-1/8	3-1/4	6	.960
89908	**89908TC**	R1/2	**1**	1	1-1/8	4-1/4	7	.960

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5975** SERIES

CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH BALL NOSE with NECK

- Excellent cutting qualities on stainless steel, aluminum, copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.

CARBIDE | 3 | 40° | R ±.0005 | PLAIN | TiCN | UNCOATED

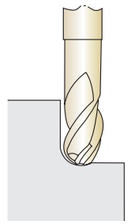
p.C710

◆ U.S.A Stock

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
UNCOATED	TiCN COATED	R (±.0005)	D1	D2	L1	L3	L2	D3
38602	**38602TC**	R3/64	**3/32**	1/4	1/8	3/16	2-3/8	.090
38601	**38601TC**	R1/16	**1/8**	1/4	3/16	1/4	2-3/8	.117
38566	**38566TC**	R3/32	**3/16**	1/4	1/4	3/8	2-1/2	.172
38573	**38573TC**	R1/8	**1/4**	1/4	3/8	1/2	3	.235
38579	**38579TC**	R5/32	**5/16**	5/16	1/2	1	3	.289
38584	**38584TC**	R3/16	**3/8**	3/8	5/8	1-1/4	3-1/8	.351
38593	**38593TC**	R1/4	**1/2**	1/2	3/4	1-3/8	3-1/2	.476
38595	**38595TC**	R5/16	**5/8**	5/8	1	1-1/2	4	.601

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

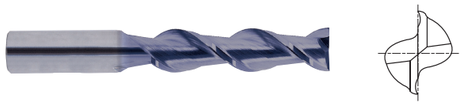
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **E5522** SERIES
PLAIN SHANK **EG522** SERIES

CARBIDE, 2 FLUTE 45° HELIX LONG LENGTH

- Suitable for high speed machining in aluminum and other non-ferrous materials, excellent surface finishes, superior chip removal.
- Mirror face-excellent surface finish.



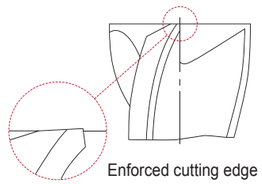
CARBIDE | 2 | 45° | PLAIN | TiCN | UNCOATED p.C711

◇ Call for Availability

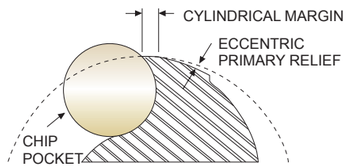
Unit : mm

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
E5522030	EG522030	3.0	.1181	6	8	57
E5522040	EG522040	4.0	.1575	6	11	57
E5522050	EG522050	5.0	.1969	6	13	57
E5522060	EG522060	6.0	.2362	6	13	57
E5522080	EG522080	8.0	.3150	8	19	63
E5522100	EG522100	10.0	.3937	10	22	72
E5522120	EG522120	12.0	.4724	12	26	83
E5522140	EG522140	14.0	.5512	14	26	83
E5522160	EG522160	16.0	.6299	16	32	92
E5522180	EG522180	18.0	.7087	18	32	92
E5522200	EG522200	20.0	.7874	20	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(45°), bigger chip pocket.



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

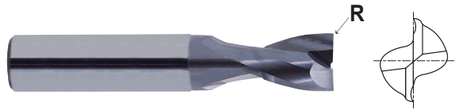
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

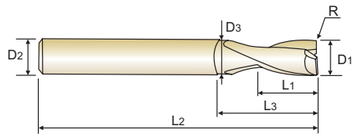
ALU-POWER END MILLS

PLAIN SHANK **EG930** SERIES

CARBIDE, 2 FLUTE 25° HELIX STUB CUT LENGTH CORNER RADIUS

- Designed for the machining aluminum and its alloys, non-ferrous materials.
- Increased tool life and higher cutting accuracy.
- Maximum-stock removal, chip ejection, stability.
- Corner Radius for avoiding the chipping.
- Mirror face-excellent surface finish.





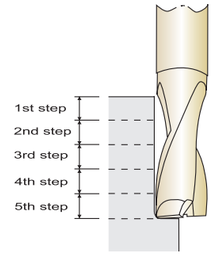
CARBIDE | 2 | 25° | R ±0.025 | PLAIN | TiCN p.C711

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±0.025)	D1		D2	L1	L3	L2	D3
EG930020	R0.2	2.0	.0787	3	3	6	40	1.9
EG930030	R0.2	3.0	.1181	3	4	8	40	2.9
EG930040	R0.2	4.0	.1575	4	5	12	50	3.8
EG930050	R0.2	5.0	.1969	5	8	14	50	4.8
EG930060	R0.2	6.0	.2362	6	8	18	65	5.7
EG930080	R0.2	8.0	.3150	8	10	22	70	7.7
EG930100	R0.2	10.0	.3937	10	14	28	80	9.7
EG930120	R0.2	12.0	.4724	12	16	35	90	11.5
EG930160	R0.2	16.0	.6299	16	20	40	90	15.5
EG930200	R0.2	20.0	.7874	20	25	50	100	19.5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



STEP MILLING

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

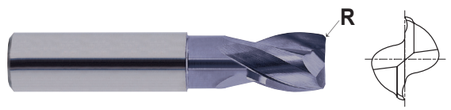
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

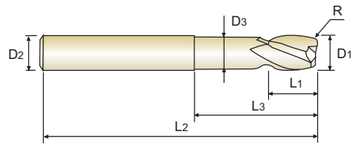
ALU-POWER END MILLS

PLAIN SHANK **EG909** SERIES

CARBIDE, 2 FLUTE STUB CUT LENGTH CORNER RADIUS with NECK

- Excellent cutting qualities on stainless steel, Aluminum, copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.





CARBIDE | 2 | 30° | R ±0.025 | PLAIN | TiCN

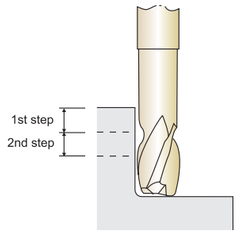
p.C712

◇ Call for Availability

Unit : mm

EDP No.	Corner Radius	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.025)	D1		D2	L1	L3	L2	D3
EG909040	R0.3	4.0	.1575	6	5	10	50	3.6
EG909060	R0.5	6.0	.2362	6	8	20	60	5.4
EG909080	R0.6	8.0	.3150	8	10	30	70	7.2
EG909100	R0.8	10.0	.3937	10	12	36	80	9.0
EG909120	R1.0	12.0	.4724	12	14	40	90	11.0
EG909160	R1.3	16.0	.6299	16	18	45	100	14.5
EG909200	R1.6	20.0	.7874	20	24	45	100	18.0

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



STEP MILLING

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

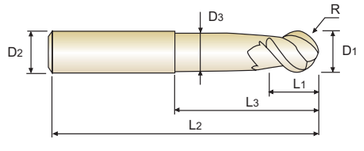
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **EG910** SERIES

CARBIDE, 2 FLUTE 50° HELIX STUB CUT LENGTH BALL NOSE with NECK

- Excellent cutting qualities on stainless steel, Aluminum, copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.



CARBIDE | 2 | 50° | R ±0.01 | PLAIN | TiCN

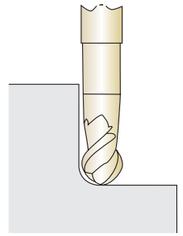
p.C712

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.01)	D1		D2	L1	L3	L2	D3
EG910060	R 3.0	6.0	.2362	6	5.5	25	55	5.4
EG910080	R 4.0	8.0	.3150	8	7	30	65	7.2
EG910100	R 5.0	10.0	.3937	10	8.5	35	75	9.0
EG910120	R 6.0	12.0	.4724	12	10.5	40	75	11.0
EG910160	R 8.0	16.0	.6299	16	14	50	90	14.5
EG910200	R 10.0	20.0	.7874	20	17	50	100	18.0

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.02	h6



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

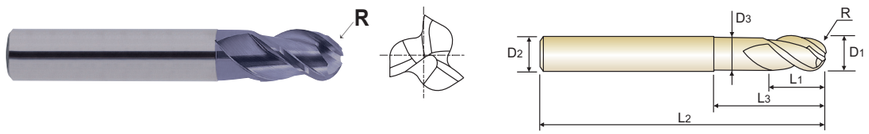
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **EG908** SERIES

CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH BALL NOSE with NECK

- Excellent cutting performance on stainless steels, Aluminum & copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.



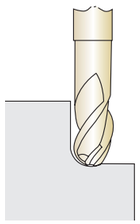
CARBIDE | 3 | 40° | R ±0.01 | PLAIN | TiCN | p.C712

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.01)	D1		D2	L1	L3	L2	D3
EG908020	R1.0	2.0	.0787	6	3	5	60	1.9
EG908025	R1.25	2.5	.0984	6	4	6	60	2.4
EG908030	R1.5	3.0	.1181	6	4.5	6.5	60	2.8
EG908035	R1.75	3.5	.1378	6	5	7	65	3.2
EG908040	R2.0	4.0	.1575	6	6	8	65	3.7
EG908050	R2.5	5.0	.1969	6	7.5	10	65	4.6
EG908060	R3.0	6.0	.2362	6	9	12	75	5.6
EG908080	R4.0	8.0	.3150	8	12	25	75	7.4
EG908100	R5.0	10.0	.3937	10	15	30	80	9.4
EG908120	R6.0	12.0	.4724	12	18	36	90	11.4
EG908160	R8.0	16.0	.6299	16	24	40	100	15.4

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

FLAT SHANK **EK191** SERIES

HSS-PM, 3 FLUTE 42° HELIX REGULAR LENGTH ROUGHING for ALUMINUM

- High performance metal removal in aluminum alloys.
- Corner radius against chipping

HSS PM | ALU | 3 | 42° | FLAT | TiCN | UNCOATED | p.C714

◆ U.S.A Stock

■ SQUARE

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED				
66515	66515 PC	1/2	1/2	1-1/4	3-1/4
66519	66519 PC	5/8	5/8	1-5/8	3-3/4
66524	66524 PC	3/4	3/4	1-5/8	3-7/8
66540	66540 PC	1	1	2	4-1/2
66541	66541 PC	1-1/4	1-1/4	2	4-1/2
66542	66542 PC	1-1/2	1-1/4	2	4-1/2
*66543	*66543 PC	2	2	2	5-3/4

*Combination Shank

HSS PM | ALU | 3 | 42° | R ±.001 | FLAT | TiCN | UNCOATED | p.C714

◆ U.S.A Stock

■ CORNER RADIUS

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiCN COATED	R				
66903	66903 PC	R.060	3/4	3/4	1-5/8	3-7/8
66904	66904 PC	R.090	3/4	3/4	1-5/8	3-7/8
66905	66905 PC	R.120	3/4	3/4	1-5/8	3-7/8
66906	66906 PC	R.060	1	1	2	4-1/2
66907	66907 PC	R.090	1	1	2	4-1/2
66908	66908 PC	R.120	1	1	2	4-1/2
66909	66909 PC	R.060	1-1/4	1-1/4	2	4-1/2
66910	66910 PC	R.090	1-1/4	1-1/4	2	4-1/2
66911	66911 PC	R.120	1-1/4	1-1/4	2	4-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

FLAT SHANK **EK226** SERIES

HSS-PM, 3 FLUTE 42° HELIX & MEDIUM LENGTH ROUGHING for ALUMINUM

▶ High performance metal removal in aluminum alloys.
▶ Corner radius against chipping

HSS PM | ALU | 3 | 42° | FLAT | TiCN | UNCOATED

p.C714

◆ U.S.A Stock

■ SQUARE

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
80524	**80524 PC**	**3/4**	3/4	2-1/2	4-5/8
80540	**80540 PC**	**1**	1	3	5-1/2
80541	**80541 PC**	**1-1/4**	1-1/4	3	5-1/2
80542	**80542 PC**	**1-1/2**	1-1/4	3	5-1/2
✻**80543**	✻**80543 PC**	**2**	2	3	6-3/4

✻Combination Shank

HSS PM | ALU | 3 | 42° | R ±.001 | FLAT | TiCN | UNCOATED

p.C714

◆ U.S.A Stock

■ CORNER RADIUS

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
80901	**80901 PC**	R .060	**3/4**	3/4	2-1/4	4-5/8
80902	**80902 PC**	R .090	**3/4**	3/4	2-1/4	4-5/8
80903	**80903 PC**	R .120	**3/4**	3/4	2-1/4	4-5/8
80904	**80904 PC**	R .060	**1**	1	3	5-1/2
80905	**80905 PC**	R .090	**1**	1	3	5-1/2
80906	**80906 PC**	R .120	**1**	1	3	5-1/2
80907	**80907 PC**	R .060	**1-1/4**	1-1/4	3	5-1/2
80908	**80908 PC**	R .090	**1-1/4**	1-1/4	3	5-1/2
80909	**80909 PC**	R .120	**1-1/4**	1-1/4	3	5-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

FLAT SHANK **EK192** SERIES

HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING for ALUMINUM

▶ High performance metal removal in aluminum alloys.

HSS PM | ALU | 3 | 42° | FLAT | TiCN | UNCOATED

p.C714

◆ U.S.A Stock

■ SQUARE

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
67515	**67515 PC**	**1/2**	1/2	2	4
67519	**67519 PC**	**5/8**	5/8	2-1/2	4-5/8
67524	**67524 PC**	**3/4**	3/4	3	5-1/4
67540	**67540 PC**	**1**	1	4	6-1/2
67541	**67541 PC**	**1-1/4**	1-1/4	4	6-1/2
67542	**67542 PC**	**1-1/2**	1-1/4	4	6-1/2
✻**67543**	✻**67543 PC**	**2**	2	4	7-3/4
67544	**67544 PC**	**1-1/4**	1-1/4	6	8-1/2
67545	**67545 PC**	**1-1/2**	1-1/4	6	8-1/2
✻**67546**	✻**67546 PC**	**2**	2	6	9-3/4

✻Combination Shank

■ with NECK

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
EK10482	**EK10482C**	**3/4**	3/4	1-1/2	3	5-1/4	.705
EK10483	**EK10483C**	**3/4**	3/4	1-1/2	4	6-1/4	.705
EK10642	**EK10642C**	**1**	1	1-1/2	3	5-1/2	.950
EK10643	**EK10643C**	**1**	1	2	4	6-1/2	.950
EK10644	**EK10644C**	**1**	1	2	6	8-1/2	.950
EK11601	**EK11601C**	**1-1/4**	1-1/4	2	4	6-1/2	1.200
EK11602	**EK11602C**	**1-1/4**	1-1/4	2	6	8-1/2	1.200

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended																					

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

FLAT SHANK **EK192** SERIES

HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING with CORNER RADIUS for ALUMINUM

▶ High performance metal in aluminum alloys.
▶ Corner radius against chipping

HSS PM | ALU | 3 | 42° | R ±.001 | FLAT | TiCN | UNCOATED

p.C714

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
67904	67904 PC	R.060	3/4	3/4	3	5-1/4
67905	67905 PC	R.090	3/4	3/4	3	5-1/4
67906	67906 PC	R.120	3/4	3/4	3	5-1/4
67907	67907 PC	R.060	1	1	4	6-1/2
67908	67908 PC	R.090	1	1	4	6-1/2
67909	67909 PC	R.120	1	1	4	6-1/2
67910	67910 PC	R.060	1-1/4	1-1/4	4	6-1/2
67911	67911 PC	R.090	1-1/4	1-1/4	4	6-1/2
67912	67912 PC	R.120	1-1/4	1-1/4	4	6-1/2
67913	67913 PC	R.060	1-1/4	1-1/4	6	8-1/2
67914	67914 PC	R.090	1-1/4	1-1/4	6	8-1/2
67915	67915 PC	R.120	1-1/4	1-1/4	6	8-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

FLAT SHANK **EK196** SERIES

HSS-PM, 3 FLUTE 42° HELIX ROUGHING BALL NOSE REGULAR LENGTH for ALUMINUM

▶ High performance metal removal in aluminum alloys.

HSS PM | ALU | 3 | 42° | R ±.001 | FLAT | TiCN | UNCOATED

p.C713

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Radius of Ball Nose R (±.001)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EP12032	EP12032C	R1/4	1/2	1/2	1-1/4	3-1/4
EP12040	EP12040C	R5/16	5/8	5/8	1-5/8	3-3/4
EP12048	EP12048C	R3/8	3/4	3/4	1-5/8	3-7/8
EP12064	EP12064C	R1/2	1	1	2	4-1/2
EP12110	EP12110C	R5/8	1-1/4	1-1/4	2	4-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

FLAT SHANK **EK193** SERIES
FLAT SHANK **EK132** SERIES

HSS-PM, 3 FLUTE FINISHING REGULAR LENGTH & MEDIUM LENGTH & LONG LENGTH

▶High performance metal removal in aluminum alloys.

HSS PM | 3 | 42° | FLAT | TiCN | UNCOATED

p.C715

◆ U.S.A Stock

■ SQUARE

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EP10323	EP10323C	1/2	1/2	1-1/4	3-1/4
EP10324	EP10324C	1/2	1/2	2	4
EP10403	EP10403C	5/8	5/8	1-5/8	3-3/4
EP10404	EP10404C	5/8	5/8	2-1/2	4-5/8
EP10484	EP10484C	3/4	3/4	1-5/8	3-7/8
EP10485	EP10485C	3/4	3/4	2-1/4	4-5/8
EP10486	EP10486C	3/4	3/4	3	5-1/4
EP10644	EP10644C	1	1	2	4-1/2
EP10645	EP10645C	1	1	3	5-1/2
EP10646	EP10646C	1	1	4	6-1/2
EP11165	EP11165C	1-1/4	1-1/4	2	4-1/2
EP11166	EP11166C	1-1/4	1-1/4	3	5-1/2
EP11167	EP11167C	1-1/4	1-1/4	4	6-1/2
EP11324	EP11324C	1-1/2	1-1/4	2	4-1/2
EP11325	EP11325C	1-1/2	1-1/4	3	5-1/2
EP11326	EP11326C	1-1/2	1-1/4	4	6-1/2

■ SQUARE with NECK

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
EK13210	EK13210C	3/4	3/4	1-1/2	3	5-1/4	.705
EK13211	EK13211C	3/4	3/4	1-1/2	4	6-1/4	.705
EK13212	EK13212C	1	1	1-1/2	3	5-1/2	.950
EK13213	EK13213C	1	1	2	4	6-1/2	.950
EK13214	EK13214C	1	1	2	6	8-1/2	.950
EK13215	EK13215C	1-1/4	1-1/4	2	4	6-1/2	1.200
EK13216	EK13216C	1-1/4	1-1/4	2	6	8-1/2	1.200

Mill Dia. Tolerance (inch)	
0~+.0010	**0~+.0015

■ The TiN coated, or TiAlN coated is available on your request.

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

FLAT SHANK **EK193** SERIES

HSS-PM, 3 FLUTE FINISHING CORNER RADIUS REGULAR LENGTH & MEDIUM LENGTH & LONG LENGTH

▶High performance metal removal in aluminum alloys.
▶Corner radius against chipping

HSS PM | 3 | 42° | FLAT | TiCN | UNCOATED

p.C715

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiCN COATED	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
EP10321	EP10321C	R.120	1/2	1/2	1-1/4	3-1/4
EP10322	EP10322C	R.120	1/2	1/2	2	4
EP10401	EP10401C	R.120	5/8	5/8	1-5/8	3-3/4
EP10402	EP10402C	R.120	5/8	5/8	2-1/2	4-5/8
EP10481	EP10481C	R.120	3/4	3/4	1-5/8	3-7/8
EP10482	EP10482C	R.120	3/4	3/4	2-1/4	4-5/8
EP10483	EP10483C	R.120	3/4	3/4	3	5-1/4
EP10641	EP10641C	R.120	1	1	2	4-1/2
EP10642	EP10642C	R.120	1	1	3	5-1/2
EP10643	EP10643C	R.120	1	1	4	6-1/2
EP11162	EP11162C	R.120	1-1/4	1-1/4	2	4-1/2
EP11163	EP11163C	R.120	1-1/4	1-1/4	3	5-1/2
EP11164	EP11164C	R.120	1-1/4	1-1/4	4	6-1/2
EP11321	EP11321C	R.120	1-1/2	1-1/4	2	4-1/2
EP11322	EP11322C	R.120	1-1/2	1-1/4	3	5-1/2
EP11323	EP11323C	R.120	1-1/2	1-1/4	4	6-1/2

■ The TiN coated, or TiAlN coated is available on your request.

Mill Dia. Tolerance (inch)	
0~+.0010	**0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **EP922** SERIES

HSS-PM, 3 FLUTE 42° HELIX SHORT LENGTH ROUGHING for ALUMINUM

- Maximum stock removal rates at High Speed Condition.
- Reduces vibrations and improves surface roughness.

HSS PM | ALU | 3 | 42° | PLAIN | TiAlN

p.C715

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	Metric	Inch			
	js12		h6		
EP922120	12.0	.4724	12	26	83
EP922140	14.0	.5512	12	26	83
EP922160	16.0	.6299	16	32	92
EP922180	18.0	.7087	16	32	92
EP922200	20.0	.7874	20	38	104
EP922220	22.0	.8661	20	38	104
EP922250	25.0	.9843	25	45	121
EP922280	28.0	1.1024	25	45	121
EP922320	32.0	1.2598	32	53	133

Tolerances according to DIN 7160 & 7161

Tolerance range in µm						
Nominal-Diameter in mm						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 / − 6	0 / − 8	0 / − 9	0 / − 11	0 / − 13	0 / − 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS

PLAIN SHANK **EP924** SERIES

HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING for ALUMINUM

- Maximum stock removal rates at High Speed Condition.
- Reduces vibrations and improves surface roughness.

HSS PM | ALU | 3 | 42° | PLAIN | TiAlN

p.C715

◇ Call for Availability

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	Metric	Inch			
	js12		h6		
EP924120	12.0	.4724	12	53	110
EP924140	14.0	.5512	12	53	110
EP924160	16.0	.6299	16	63	123
EP924180	18.0	.7087	16	63	123
EP924200	20.0	.7874	20	75	141
EP924220	22.0	.8661	20	75	141
EP924250	25.0	.9843	25	90	166
EP924280	28.0	1.1024	25	90	166
EP924320	32.0	1.2598	32	106	186

Tolerances according to DIN 7160 & 7161

Tolerance range in µm						
Nominal-Diameter in mm						
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50
js12	± 50	± 60	± 75	± 90	± 105	± 125
h6	0 / − 6	0 / − 8	0 / − 9	0 / − 11	0 / − 13	0 / − 16

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E5253, E5254 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

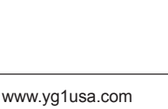
2 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM(Vc)	325	410	490	655	655	785	1045	885	980	720	850
					IPT(fz)	.0018	.0022	.0026	.0030	.0044	.0052	.0064	.0073	.0079	.0089	.0094
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000
					IPM(FEED)	35	43	51	59	71	83	102	87	95	71	75

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	325	410	490	655	655	785	1045	885	980	720	850
					IPT(fz)	.0014	.0018	.0020	.0024	.0034	.0042	.0052	.0059	.0063	.0069	.0079
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000
					IPM(FEED)	28	35	39	47	55	67	83	71	75	55	63

※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

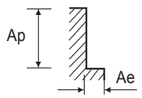
EG253, EG254 SERIES TiCN Coated

2 FLUTE - SIDE CUTTING

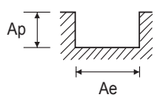
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM(Vc)	395	490	590	785	785	940	1255	1060	1180	865	1020
					IPT(fz)	.0024	.0028	.0033	.0040	.0057	.0067	.0084	.0092	.0102	.0114	.0123
					RPM	12000	12000	12000	12000	9600	9600	9600	7200	7200	4800	4800
					IPM(FEED)	57	66	80	95	109	128	161	132	147	109	118

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	510	640	765	1020	980	1180	1570	1415	1570	1080	1275
					IPT(fz)	.0014	.0018	.0020	.0023	.0035	.0043	.0053	.0057	.0061	.0071	.0079
					RPM	15600	15600	15600	15600	12000	12000	12000	9600	9600	6000	6000
					IPM(FEED)	43	57	61	71	85	104	128	109	118	85	95



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E5980, E5981, E5982, E5983, E5984 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM(Vc)	325	410	490	655	655	785	1045	885	980	720	850
					IPT(fz)	.0014	.0017	.0020	.0024	.0035	.0041	.0051	.0058	.0063	.0071	.0075
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000
					IPM(FEED)	43	52	61	71	85	99	123	104	113	85	90

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	325	410	490	655	655	785	1045	885	980	720	850
					IPT(fz)	.0011	.0014	.0016	.0019	.0028	.0033	.0041	.0047	.0050	.0055	.0063
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000
					IPM(FEED)	33	43	47	57	66	80	99	85	90	66	76

※ The Feed, in long & extra long types, should be reduced by around 50%.

※ The Feed, in long & extra long types, should be reduced by around 50%.

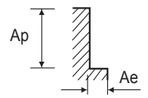
EG980, EG981, EG982, EG983, EG984 SERIES TiCN Coated

3 FLUTE - SIDE CUTTING

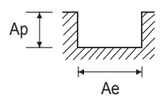
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM(Vc)	395	490	590	785	785	940	1255	1060	1180	865	1020
					IPT(fz)	.0015	.0019	.0022	.0026	.0039	.0045	.0056	.0063	.0068	.0077	.0081
					RPM	12000	12000	12000	12000	9600	9600	9600	7200	7200	4800	4800
					IPM(FEED)	55	68	80	92	111	129	160	135	147	111	117

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	510	640	765	1020	980	1180	1570	1415	1570	1080	1275
					IPT(fz)	.0009	.0012	.0013	.0016	.0024	.0029	.0036	.0039	.0041	.0048	.0054
					RPM	15600	15600	15600	15600	12000	12000	12000	9600	9600	6000	6000
					IPM(FEED)	43	55	61	74	86	104	129	111	117	86	98



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E5977, E5985 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM(Vc)	525	630	840	785	630	680
					IPT(fz)	.0024	.0041	.0051	.0063	.0091	.0101
					RPM	8000	6400	6400	4800	3200	2600
					IPM(FEED)	57	79	98	91	87	79

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	525	630	840	785	630	680
					IPT(fz)	.0019	.0033	.0041	.0050	.0074	.0082
					RPM	8000	6400	6400	4800	3200	2600
					IPM(FEED)	45	64	79	72	71	64

※ The Feed, in long & extra long types, should be reduced by around 50%.

※ The Feed, in long & extra long types, should be reduced by around 50%.

EG977, EG985 SERIES TiCN Coated

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/8 ~ 3/8 : 0.25D D1/2 ~ 13/16 : 0.5D	1.0D	SFM(Vc)	685	815	1085	1015	825	890
					IPT(fz)	.0023	.0041	.0051	.0063	.0090	.0100
					RPM	10500	8300	8300	6200	4200	3400
					IPM(FEED)	74	103	128	118	114	102

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	685	815	1085	1015	825	890
					IPT(fz)	.0028	.0051	.0062	.0075	.0110	.0122
					RPM	10500	8300	8300	6200	4200	3400
					IPM(FEED)	59	84	103	93	92	83

ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E5973 SERIES

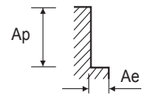
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

2 FLUTE - SIDE CUTTING

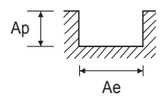
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 5/32	1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D5/32 ~ 3/8 : 0.25D D1/2 ~ 3/4 : 0.5D	1.0D	SFM(Vc)	410	655	655	785	1045	980	785
					IPT(fz)	.0021	.0031	.0044	.0051	.0064	.0078	.0095
					RPM	10000	10000	8000	8000	8000	6000	4000
					IPM(FEED)	42	61	70	82	103	94	76
	26-28	Copper and Copper Alloys (Bronze / Brass)	D5/32 ~ 3/8 : 0.25D D1/2 ~ 3/4 : 0.5D	1.0D	SFM(Vc)	125	195	190	225	300	295	225
					IPT(fz)	.0018	.0025	.0039	.0046	.0057	.0067	.0083
					RPM	3000	3000	2300	2300	2300	1800	1150
					IPM(FEED)	11	15	18	21	26	24	19

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 5/32	1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	410	655	655	785	1045	980	785
					IPT(fz)	.0018	.0023	.0034	.0042	.0051	.0063	.0076
					RPM	10000	10000	8000	8000	8000	6000	4000
					IPM(FEED)	36	45	55	67	82	76	61
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	0.5D	SFM(Vc)	125	195	190	225	300	295	225
					IPT(fz)	.0015	.0020	.0030	.0037	.0046	.0053	.0065
					RPM	3000	3000	2300	2300	2300	1800	1150
					IPM(FEED)	9	12	14	17	21	19	15



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

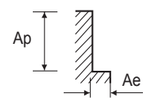
E5976 SERIES

2 FLUTE - SIDE CUTTING

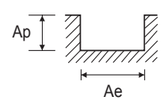
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D1/4 ~ 3/8 : 0.25D D1/2 ~ 1 : 0.5D	1.0D	SFM(Vc)	525	630	840	785	630	680
					IPT(fz)	.0029	.0052	.0064	.0079	.0114	.0127
					RPM	8000	6400	6400	4800	3200	2600
					IPM(FEED)	47	66	82	76	73	66

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	525	630	840	785	630	680
					IPT(fz)	.0024	.0042	.0052	.0063	.0092	.0102
					RPM	8000	6400	6400	4800	3200	2600
					IPM(FEED)	38	54	66	60	59	53



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

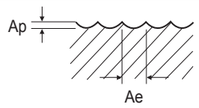
ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E5978 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

2 FLUTE - PLANE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM(Vc)	735	705	845	1125	1115	845
					IPT(fz)	.0025	.0037	.0043	.0055	.0063	.0080
					RPM	11200	8600	8600	8600	6800	4300
					IPM(FEED)	55	63	74	95	85	69

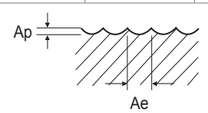


※ The Feed, in long & extra long types, should be reduced by around 50%.

E5978 SERIES TiCN Coated

2 FLUTE - PLANE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM(Vc)	950	915	1100	1465	1440	1100
					IPT(fz)	.0025	.0037	.0043	.0055	.0063	.0093
					RPM	14500	11200	11200	11200	8800	5600
					IPM(FEED)	72	82	96	123	111	104

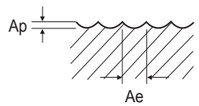


※ The Feed, in long & extra long types, should be reduced by around 50%.

E5974 SERIES

3 FLUTE - PLANE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM(Vc)	915	885	1060	1415	1390	1060
					IPT(fz)	.0019	.0028	.0033	.0042	.0048	.0062
					RPM	14000	10800	10800	10800	8500	5400
					IPM(FEED)	53	61	71	91	82	67
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	0.2D	SFM(Vc)	275	260	315	420	410	315
					IPT(fz)	.0015	.0023	.0028	.0036	.0040	.0053
					RPM	4200	3200	3200	3200	2500	1600
					IPM(FEED)	13	15	18	23	20	17

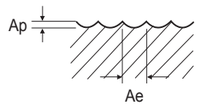


※ The Feed, in long & extra long types, should be reduced by around 50%.

E5975 SERIES

3 FLUTE - PLANE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM(Vc)	510	450	675	905	885	1060	1415	1390
					IPT(fz)	.0005	.0007	.0010	.0013	.0019	.0022	.0028	.0032
					RPM	20700	13800	13800	13800	10800	10800	10800	8500
					IPM(FEED)	29	29	41	53	61	71	91	82
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	0.2D	SFM(Vc)	150	135	205	275	260	315	420	410
					IPT(fz)	.0004	.0006	.0008	.0010	.0016	.0019	.0024	.0027
					RPM	6200	4200	4200	4200	3200	3200	3200	2500
					IPM(FEED)	7	7	10	13	15	18	23	20



※ The Feed, in long & extra long types, should be reduced by around 50%.

ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E5522 SERIES

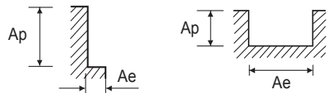
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

2 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D3 ~ 10 : 0.25D D12 ~ 20 : 0.5D	1.0D	SFM(Vc)	310	410	515	620	660	825	990	865	990	740	825
					IPT(fz)	.0018	.0022	.0026	.0030	.0044	.0052	.0064	.0073	.0079	.0089	.0094
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000
					IPM(FEED)	35	43	51	59	71	83	102	87	95	71	75

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	310	410	515	620	660	825	990	865	990	740	825
					IPT(fz)	.0014	.0018	.0020	.0024	.0034	.0042	.0052	.0059	.0063	.0069	.0079
					RPM	10000	10000	10000	10000	8000	8000	8000	6000	6000	4000	4000
					IPM(FEED)	28	35	39	47	55	67	83	71	75	55	63



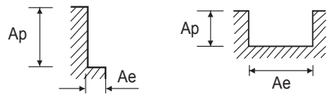
EG522, EG930 SERIES TiCN Coated

2 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	D3 ~ 10 : 0.25D D12 ~ 20 : 0.5D	1.0D	SFM(Vc)	400	535	670	805	825	1030	1235	1155	1320	930	1030
					IPT(fz)	.0018	.0021	.0026	.0030	.0046	.0053	.0067	.0069	.0076	.0091	.0098
					RPM	13000	13000	13000	13000	10000	10000	10000	8000	8000	5000	5000
					IPM(FEED)	47	55	67	79	91	106	134	110	122	91	98

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	400	535	670	805	825	1030	1235	1155	1320	930	1030
					IPT(fz)	.0013	.0018	.0020	.0023	.0036	.0044	.0053	.0057	.0061	.0071	.0079
					RPM	13000	13000	13000	13000	10000	10000	10000	8000	8000	5000	5000
					IPM(FEED)	35	47	51	59	71	87	106	91	98	71	79



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EG909 SERIES — TiCN Coated

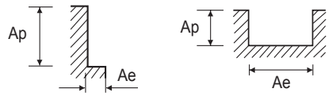
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

2 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 4.0	6.0	8.0	10.0	12.0	16.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	~D10 : 0.25D D12 ~ 20 : 0.5D	1.0D	SFM(Vc)	535	805	825	1030	1235	1320	1030
					IPT(fz)	.0021	.0030	.0046	.0053	.0067	.0076	.0098
					RPM	13000	13000	10000	10000	10000	8000	5000
					IPM(FEED)	55	79	91	106	134	122	98
	26-28	Copper and Copper Alloys (Bronze / Brass)	~D10 : 0.25D D12 ~ 20 : 0.5D	1.0D	SFM(Vc)	160	240	245	310	370	395	310
					IPT(fz)	.001	.002	.003	.004	.005	.006	.008
					RPM	3900	3900	3000	3000	3000	2400	1500
					IPM(FEED)	14	20	23	27	34	31	25

2 FLUTE - SLOTTING

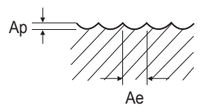
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 4.0	6.0	8.0	10.0	12.0	16.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	535	805	825	1030	1235	1320	1030
					IPT(fz)	.0018	.0023	.0036	.0044	.0053	.0061	.0079
					RPM	13000	13000	10000	10000	10000	8000	5000
					IPM(FEED)	47	59	71	87	106	98	79
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	0.5D	SFM(Vc)	160	240	245	310	370	395	310
					IPT(fz)	.001	.001	.003	.003	.004	.005	.006
					RPM	3900	3900	3000	3000	3000	2400	1500
					IPM(FEED)	12	15	18	22	27	25	20



EG910 SERIES — TiCN Coated

2 FLUTE - PLANE

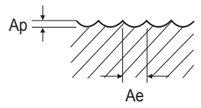
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 6.0	8.0	10.0	12.0	16.0	20.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM(Vc)	1115	1155	1445	1730	1815	1445
					IPT(fz)	.0019	.0028	.0033	.0042	.0048	.0062
					RPM	18000	14000	14000	14000	11000	7000
					IPM(FEED)	69	79	93	118	106	87
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	0.2D	SFM(Vc)	340	345	435	520	545	435
					IPT(fz)	.001	.002	.002	.003	.003	.005
					RPM	5500	4200	4200	4200	3300	2100
					IPM(FEED)	17	20	23	30	26	22



EG908 SERIES — TiCN Coated

3 FLUTE - PLANE

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	0.2D	SFM(Vc)	555	565	555	740	930	1115	1155	1445	1730	1815
					IPT(fz)	.0005	.0006	.0007	.0009	.0010	.0013	.0019	.0022	.0028	.0032
					RPM	27000	22000	18000	18000	18000	18000	14000	14000	14000	11000
					IPM(FEED)	37	37	37	49	53	69	79	93	118	106
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	0.2D	SFM(Vc)	165	165	170	225	285	340	345	435	520	545
					IPT(fz)	.0004	.0005	.0006	.0007	.0007	.001	.001	.001	.002	.002
					RPM	8000	6500	5500	5500	5500	5500	4200	4200	4200	3300
					IPM(FEED)	10	10	10	12	13	17	20	23	30	26



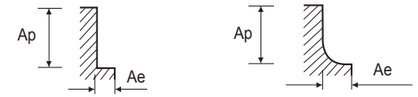
ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E5E44, E5E98, E5E45 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

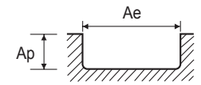
3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	655	660	670	655	650	655
					IPT(fz)	.0010	.0011	.0015	.0020	.0026	.0032
					RPM	10000	6700	5100	4000	3300	2500
					IPM(FEED)	30	23	23	24	26	24



3 FLUTE - SLOTTING

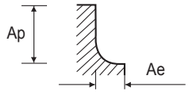
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	1
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	1.5D	SFM(Vc)	460	460	470	460	450	470
					IPT(fz)	.0010	.0011	.0015	.0020	.0028	.0031
					RPM	7000	4700	3600	2800	2300	1800
					IPM(FEED)	21	16	16	17	19	17



EK196 SERIES

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	295	255	245	260	260
					IPT(fz)	.0006	.0010	.0019	.0027	.0038
					RPM	4500	3100	2500	2000	1600
					IPM(FEED)	8	9	14	16	18



ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EK191, EK226, EK192 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/2	3/4	1	1-1/4	2
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM(Vc)	250~500	250~500	250~500	250~500	250~500
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	1910~3820	1270~2550	960~1910	760~1530	480~960
					IPM(FEED)	29~57	27~54	29~57	27~55	22~43
	23-22	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	250~750	250~750	250~750	250~750	250~750
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	1910~5730	1270~3820	960~2870	760~2290	480~1430
					IPM(FEED)	29~86	27~80	29~86	27~82	22~64

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/2	3/4	1	1-1/4	2
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	SFM(Vc)	250~500	250~500	250~500	250~500	250~500
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	1910~3820	1270~2550	960~1910	760~1530	480~960
					IPM(FEED)	29~57	27~54	29~57	27~55	22~43
	23-22	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	250~750	250~750	250~750	250~750	250~750
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	1910~5730	1270~3820	960~2870	760~2290	480~1430
					IPM(FEED)	29~86	27~80	29~86	27~82	22~64

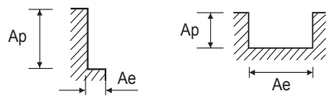
EK191, EK226, EK192 SERIES — TiCN Coated

3 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/2	3/4	1	1-1/4	2
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM(Vc)	400~2500	400~2500	400~2500	400~2500	400~2500
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	3060~19100	2040~12730	1530~9550	1220~7640	760~4780
					IPM(FEED)	46~287	43~267	46~287	44~275	34~215
	23-22	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	500~3250	500~3250	500~3250	500~3250	500~3250
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	3820~24830	2550~16550	1910~12420	1530~9930	960~6210
					IPM(FEED)	57~372	54~348	57~372	55~357	43~279

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/2	3/4	1	1-1/4	2
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	SFM(Vc)	400~2500	400~2500	400~2500	400~2500	400~2500
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	3060~19100	2040~12730	1530~9550	1220~7640	760~4780
					IPM(FEED)	46~287	43~267	46~287	44~275	34~215
	23-22	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	500~3250	500~3250	500~3250	500~3250	500~3250
					IPT(fz)	.0050	.0070	.0100	.0120	.0150
					RPM	3820~24830	2550~16550	1910~12420	1530~9930	960~6210
					IPM(FEED)	57~372	54~348	57~372	55~357	43~279



ALU-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

EK193, EK132 SERIES

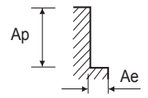
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE - SIDE CUTTING

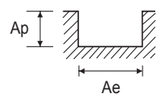
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/2	5/8	3/4	1	1-1/4	1-1/2
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	590	575	450	525	525	530
					IPT(fz)	.0028	.0025	.0039	.0045	.0054	.0062
					RPM	4500	3500	2300	2000	1600	1350
					IPM(FEED)	38	26	27	27	26	25

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/2	5/8	3/4	1	1-1/4	1-1/2
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	535	520	410	475	475	485
					IPT(fz)	.0031	.0041	.0065	.0073	.0087	.0103
					RPM	4095	3185	2093	1820	1456	1229
					IPM(FEED)	38	39	41	40	38	38



※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

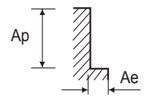
EP922, EP924 SERIES — TiAlN Coated

3 FLUTE - SIDE CUTTING

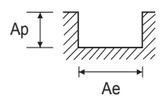
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 12.0	16.0	20.0	25.0	32.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	345	365	350	360	365
					IPT(fz)	.0019	.0027	.0041	.0043	.0064
					RPM	2800	2200	1700	1400	1100
					IPM(FEED)	16	18	21	18	21

3 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 12.0	16.0	20.0	25.0	32.0
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	345	365	350	360	365
					IPT(fz)	.0026	.0038	.0055	.0060	.0085
					RPM	2800	2200	1700	1400	1100
					IPM(FEED)	22	25	28	25	28

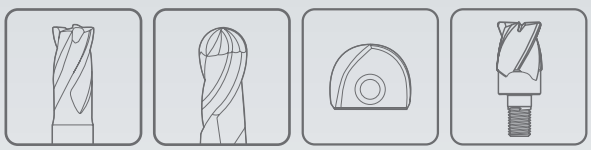


※ The Feed, in long & extra long types, should be reduced by around 50%.



※ The Feed, in long & extra long types, should be reduced by around 50%.

Global Cutting Tool Leader **YG-1**



MILLING

YG

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D-POWER GRAPHITE END MILLS

- For Graphites

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SOLID CARBIDE
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◎ : Excellent ○ : Good

Recommended cutting conditions : p.C730

						Inch		
					SERIES	EI107	EI099	EI106
					FLUTE	2&4	2	4
					HELIX ANGLE	30°	30°	30°
					CUTTING EDGE SHAPE	SQUARE	BALL NOSE	BALL NOSE
					SIZE MIN	D1/64	R.0391	R.0391
					SIZE MAX	D1/2	R1/4	R1/4
					PAGE	C720	C721	
						REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH
						Diamond	Diamond	Diamond
							U.S.A Stock	
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc		
P	1	Non-alloy steel	About 0.15% C	Annealed	125			
	2		About 0.45% C	Annealed	190	13		
	3		About 0.45% C	Quenched & Tempered	250	25		
	4		About 0.75% C	Annealed	270	28		
	5		About 0.75% C	Quenched & Tempered	300	32		
	6	Low alloy steel		Annealed	180	10		
	7			Quenched & Tempered	275	29		
	8			Quenched & Tempered	300	32		
	9			Quenched & Tempered	350	38		
	10	High alloyed steel, and tool steel		Annealed	200	15		
	11			Quenched & Tempered	325	35		
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15		
	13		Martensitic	Quenched & Tempered	240	23		
	14		Austenitic		180	10		
K	15	Grey cast iron	Pearlitic / ferritic		180	10		
	16		Pearlitic (Martensitic)		260	26		
	17	Nodular cast iron	Ferritic		160	3		
	18		Pearlitic		250	25		
	19	Malleable cast iron	Ferritic		130			
	20		Pearlitic		230	21		
N	21	Aluminum-wrought alloy	Not Curable		60		○	○ ○
	22		Curable	Hardened	100		○	○ ○
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○ ○
	24		≤ 12% Si, Curable	Hardened	90		○	○ ○
	25		> 12% Si, Not Curable		130		○	○ ○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110			
	27		CuZn, CuSnZn (Brass)		90			
	28		CuSn, lead-free copper and electrolytic copper		100			
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				◎	◎ ◎
	30		Rubber, Wood, etc.					
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15		
	32			Cured	280	30		
	33		Ni or Co Based	Annealed	250	25		
	34			Cured	350	38		
	35			Cast	320	34		
	36	Titanium Alloys	Pure Titanium		400 Rm			
	37		Alpha + Beta Alloys	Hardened	1050 Rm			
H	38	Hardened steel		Hardened	550	55		
	39			Hardened	630	60		
	40	Chilled Cast Iron		Cast	400	42		
	41	Hardened Cast Iron		Hardened	550	55		

	Inch					Metric			
SERIES	EI971	EI972	EIB07	EIB05	EIB06	EI880	EI881	EI451	EI450
FLUTE	2	2	4	4	4	2	3	2	2
HELIX ANGLE	30°	30°	30°	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE
SIZE MIN	R.0391	R.0391	R.0156	D1/16	D1/32	R1.0	R1.0	R1.0	R1.0
SIZE MAX	R1/4	R5/32	R.0625	D1/2	D3/8	R6.0	R6.0	R6.0	R4.0
PAGE	C722	C723	C724	C725	C726	C727		C728	C729
	LONG LENGTH	LONG REACH	REGULAR LENGTH NECK	REGULAR LENGTH	REGULAR LENGTH NECK	SHORT LENGTH	SHORT LENGTH	LONG LENGTH	LONG REACH
	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond	Diamond
			U.S.A Stock				Call for Availability		
	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○
	○	○	○	○	○	○	○	○	○
	◎	◎	◎	◎	◎	◎	◎	◎	◎

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI107** SERIES

CARBIDE, 4(2) FLUTE REGULAR LENGTH

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide end mills may have good result for the machining of non-ferrous metals and non-metallic materials.

CARBIDE | 4 | 30° | PLAIN | Diamond p.C731

for GRAPHITE
◆ U.S.A Stock

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
★99686	1/64	1/8	3/65	1-1/2
99629	1/8	1/8	1/2	1-1/2
99630	3/16	3/16	5/8	2
99631	1/4	1/4	3/4	2-1/2
99632	5/16	5/16	13/16	2-1/2
99633	3/8	3/8	7/8	2-1/2
99635	1/2	1/2	1	3

★ 2 Flute

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

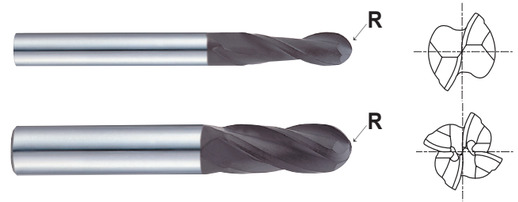
ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI099** SERIES
PLAIN SHANK **EI106** SERIES

CARBIDE, 2&4 FLUTE REGULAR LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE | 2 | 4 | 30° | R ±.0008 | PLAIN | Diamond p.C730

for GRAPHITE
◆ U.S.A Stock

EI099 Series ■ 2 FLUTE, **EI106 Series** ■ 4 FLUTE

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
2 FLUTE	4 FLUTE	R (±.0008)				
99572	99621	R.0391	5/64	1/8	1/4	1-1/2
99573	99622	R3/64	3/32	1/8	3/8	1-1/2
99574	99623	R1/16	1/8	1/8	1/2	1-1/2
99575	99624	R3/32	3/16	3/16	5/8	2
99576	99625	R1/8	1/4	1/4	3/4	2-1/2
99577	99626	R5/32	5/16	5/16	13/16	2-1/2
99578	99627	R3/16	3/8	3/8	7/8	2-1/2
99583	99628	R1/4	1/2	1/2	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

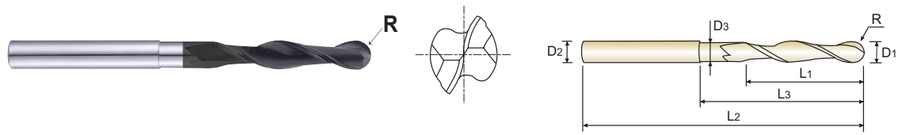
ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI971** SERIES

CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE | 2 | 30° | R ±.0008 | PLAIN | Diamond

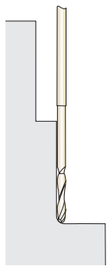
p.C730

for GRAPHITE
◆ U.S.A Stock

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0008)	D1	D2	L1	L3	L2	D3
99671	R.0391	**5/64**	1/8	3/8	3/4	3-1/4	.076
99672	R1/16	**1/8**	1/8	5/8	1	3-1/4	.120
99973	R3/32	**3/16**	3/16	1-1/8	2	4	.182
99673	R3/32	**3/16**	1/4	1-1/8	2	4	.185
99674	R1/8	**1/4**	1/4	1-1/8	2	4	.230
99675	R5/32	**5/16**	5/16	1-1/2	2-3/8	4-1/2	.293
99676	R3/16	**3/8**	3/8	2	2-3/4	4-3/4	.355
99677	R1/4	**1/2**	1/2	2-1/8	3	5-1/8	.480

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

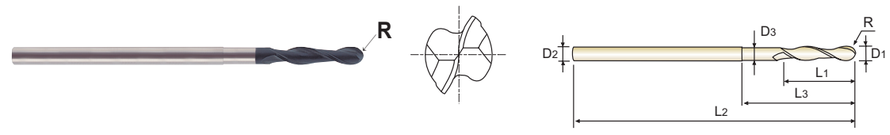
ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI972** SERIES

CARBIDE, 2 FLUTE LONG REACH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE | 2 | 30° | R ±.0008 | PLAIN | Diamond

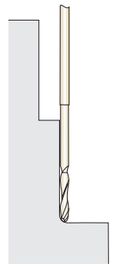
p.C730

for GRAPHITE
◆ U.S.A Stock

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0008)	D1	D2	L1	L3	L2	D3
99678	R.0391	**5/64**	1/8	3/8	3/4	4	.076
99679	R1/16	**1/8**	1/8	5/8	1	4	.120
99980	R3/32	**3/16**	3/16	1-1/8	2	4-3/4	.182
99680	R3/32	**3/16**	1/4	1-1/8	2	4-3/4	.186
99681	R1/8	**1/4**	1/4	1-1/8	2	6	.230
99682	R5/32	**5/16**	5/16	1-1/2	2-3/8	6	.293

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EIB07 SERIES**

CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE with NECK

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.

CARBIDE | 4 | 30° | R ±.0008 | PLAIN | Diamond p.C730

for GRAPHITE
◆ U.S.A Stock

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.0008)	D1	D2	L1	L3	L2	D3
EIB07002	R.0156	**1/32**	1/8	3/32	3/8	3	.028
EIB07901	R.0156	**1/32**	1/8	3/32	1/2	3	.028
EIB07003	R.0234	**3/64**	1/8	9/64	9/16	3	.043
EIB07902	R.0234	**3/64**	1/8	9/64	3/4	3	.043
EIB07004	R.0312	**1/16**	1/8	3/16	3/4	3	.057
EIB07903	R.0312	**1/16**	1/8	3/16	1	3	.057
EIB07006	R.0469	**3/32**	1/8	9/32	1	3	.086
EIB07904	R.0469	**3/32**	1/8	9/32	1-1/2	3	.086
EIB07008	R.0625	**1/8**	1/8	3/8	1-1/2	3	.115
EIB07905	R.0625	**1/8**	1/8	3/8	2	3	.115

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EIB05 SERIES**

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.

CARBIDE | 4 | 30° | R ±.001 | PLAIN | Diamond p.C730

for GRAPHITE
◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.001)	D1	D2	L1	L3	L2	D3
EIB05004	R.010	**1/16**	1/8	3/16	-	1-1/2	-
EIB05901	R.015	**1/16**	1/8	3/16	-	1-1/2	-
EIB05006	R.010	**3/32**	1/8	3/8	-	1-1/2	-
EIB05008	R.015	**1/8**	1/8	1/2	-	1-1/2	-
EIB05902	R.020	**1/8**	1/8	1/2	-	1-1/2	-
EIB05012	R.020	**3/16**	3/16	5/8	-	2	-
EIB05911	R.020	**3/16**	3/16	3/16	1-1/2	4	.169
EIB05903	R.030	**3/16**	3/16	5/8	-	2	-
EIB05016	R.020	**1/4**	1/4	3/4	-	2-1/2	-
EIB05913	R.020	**1/4**	1/4	1/4	2	4	.230
EIB05912	R.020	**1/4**	1/4	1/4	2	6	.230
EIB05904	R.030	**1/4**	1/4	3/4	-	2-1/2	-
EIB05024	R.020	**3/8**	3/8	7/8	-	2-1/2	-
EIB05908	R.020	**3/8**	3/8	3/8	2	4	.355
EIB05907	R.020	**3/8**	3/8	3/8	-	4	-
EIB05905	R.030	**3/8**	3/8	7/8	-	2-1/2	-
EIB05032	R.030	**1/2**	1/2	1	-	3	-
EIB05906	R.060	**1/2**	1/2	1	-	3	-
EIB05909	R.030	**1/2**	1/2	1-1/2	-	4	-
EIB05910	R.030	**1/2**	1/2	3	-	6	-

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EIB06 SERIES**

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS with NECK

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.

CARBIDE | 4 | 30° | R ±.001 | PLAIN | Diamond

p.C731

for GRAPHITE

◆ U.S.A Stock

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
	R (±.001)	D1	D2	L1	L3	L2	D3
EIB06002	R.005	**1/32**	1/8	3/32	3/8	3	.028
EIB06901	R.005	**1/32**	1/8	3/32	1/2	3	.028
EIB06003	R.010	**3/64**	1/8	9/64	9/16	3	.043
EIB06902	R.010	**3/64**	1/8	9/64	3/4	3	.043
EIB06004	R.010	**1/16**	1/8	3/16	3/4	3	.057
EIB06903	R.010	**1/16**	1/8	3/16	1	3	.057
EIB06006	R.010	**3/32**	1/8	9/32	1	3	.086
EIB06904	R.010	**3/32**	1/8	9/32	1-1/2	3	.086
EIB06008	R.010	**1/8**	1/8	3/8	1-1/2	3	.115
EIB06905	R.010	**1/8**	1/8	3/8	2	3	.115
EIB06906	R.015	**1/8**	1/8	3/16	.800	2-1/2	.115
EIB06907	R.020	**3/8**	3/8	3/8	3	6	.355

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

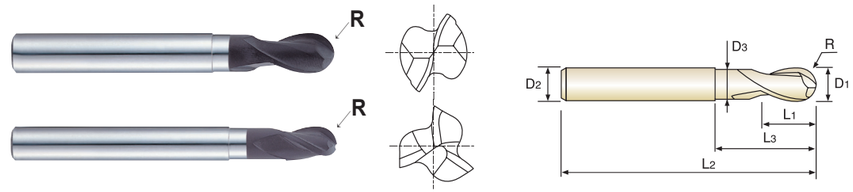
D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI880 SERIES**

PLAIN SHANK **EI881 SERIES**

CARBIDE, 2&3 FLUTE SHORT LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE | 2&3 | 30° | R ±0.01 | PLAIN | Diamond

p.C731

for GRAPHITE

◇ Call for Availability

EI880 Series ■ 2 FLUTE, **EI881 Series** ■ 3 FLUTE

Unit : mm

EDP No.		Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
			Metric	Inch					
2 FLUTE	3 FLUTE	R (±0.01)	D1		D2	L1	L3	L2	D3
EI880020	**EI881020**	R1.0	**2.0**	**.0787**	6	3	5	60	1.9
EI880025	**EI881025**	R1.25	**2.5**	**.0984**	6	4	6	60	2.4
EI880030	**EI881030**	R1.5	**3.0**	**.1181**	6	4.5	6.5	60	2.8
EI880035	**EI881035**	R1.75	**3.5**	**.1378**	6	5	7	65	3.2
EI880040	**EI881040**	R2.0	**4.0**	**.1575**	6	6	8	65	3.7
EI880050	**EI881050**	R2.5	**5.0**	**.1969**	6	7.5	10	65	4.6
EI880060	**EI881060**	R3.0	**6.0**	**.2362**	6	9	12	75	5.6
EI880080	**EI881080**	R4.0	**8.0**	**.3150**	8	12	25	75	7.4
EI880100	**EI881100**	R5.0	**10.0**	**.3937**	10	15	30	80	9.4
EI880120	**EI881120**	R6.0	**12.0**	**.4724**	12	18	36	90	11.4

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

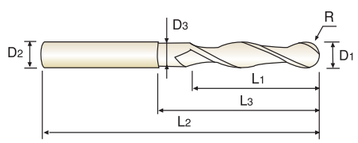
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI451** SERIES

CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Diamond

p.C731

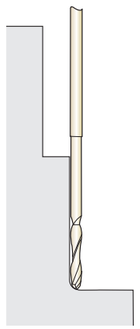
for GRAPHITE

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.01)	D1		D2	L1	L3	L2	D3
99558	R1.0	**2.0**	**.0787**	4	10	20	80	1.95
99559	R1.5	**3.0**	**.1181**	4	15	25	80	2.9
99560	R2.0	**4.0**	**.1575**	4	20	30	80	3.9
99561	R2.5	**5.0**	**.1969**	6	30	50	100	4.9
99562	R3.0	**6.0**	**.2362**	6	30	50	100	5.5
99563	R4.0	**8.0**	**.3150**	8	40	60	110	7.5
99564	R5.0	**10.0**	**.3937**	10	50	70	120	9.5
99565	R6.0	**12.0**	**.4724**	12	55	75	130	11.5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

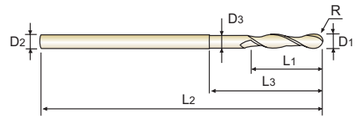
ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

D-POWER GRAPHITE END MILLS

PLAIN SHANK **EI450** SERIES

CARBIDE, 2 FLUTE LONG REACH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



CARBIDE | 2 | 30° | R ±0.01 | PLAIN | Diamond

p.C731

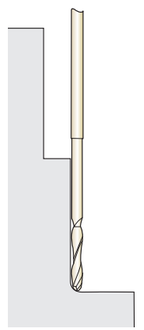
for GRAPHITE

◇ Call for Availability

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter		Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
		Metric	Inch					
	R (±0.01)	D1		D2	L1	L3	L2	D3
99566	R1.0	**2.0**	**.0787**	4	10	20	100	1.95
99567	R1.5	**3.0**	**.1181**	4	15	25	100	2.9
99568	R2.0	**4.0**	**.1575**	4	20	30	100	3.9
99569	R2.5	**5.0**	**.1969**	6	30	50	120	4.9
99570	R3.0	**6.0**	**.2362**	6	30	50	150	5.5
99571	R4.0	**8.0**	**.3150**	8	40	60	150	7.5

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0~-0.03	h6



◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S							H				
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel			Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	39-1	40	41
HRc											15	30	25	38	34			55	60	50	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630		400	550
Recommended	○	○	○	○	○				◎													

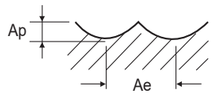
D-POWER GRAPHITE END MILLS

RECOMMENDED CUTTING CONDITIONS

EI106 SERIES — 4 FLUTE BALL NOSE - SURFACING

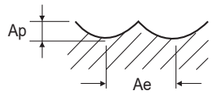
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 5/64	3/32	1/8	9/64	5/32	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM(Vc)	325	395	525	590	655	760	980	1065	1130	1375
					IPT(fz)	.0010	.0014	.0018	.0021	.0026	.0032	.0039	.0045	.0070	.0059
					RPM	15890	16090	16040	16030	16010	15480	14970	13020	11510	10510
					IPM(FEED)	63	88	114	138	165	201	232	236	324	248



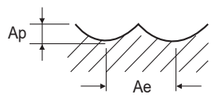
EI099, EI971, EI972 SERIES — 2 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 5/64	3/32	1/8	9/64	5/32	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM(Vc)	325	395	525	590	655	760	980	1065	1130	1375
					IPT(fz)	.0010	.0014	.0018	.0018	.0026	.0032	.0039	.0045	.0052	.0059
					RPM	15890	16090	16040	16030	16010	15480	14970	13020	11510	10510
					IPM(FEED)	32	44	57	59	83	100	116	118	120	124



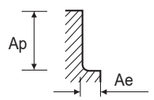
EIB07 SERIES — 4 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/32	3/64	1/16	5/64	3/32	1/8	9/64	5/32	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM(Vc)	165	245	325	325	395	525	590	655	760	980	1065	1130	1375
					IPT(fz)	.0005	.0005	.0007	.0009	.0012	.0016	.0019	.0023	.0029	.0035	.0041	.0047	.0053
					RPM	20170	19970	19860	15890	16090	16040	16030	16010	15480	14970	13020	11510	10510
					IPM(FEED)	38	43	52	57	79	102	125	147	182	211	212	217	225



EIB05 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/16	5/64	1/8	5/32	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.3D	0.3D	SFM(Vc)	655	820	1310	1635	1965	2620	2620	2550	2750
					IPT(fz)	.0008	.0010	.0014	.0020	.0024	.0028	.0034	.0043	.0051
					RPM	40030	40090	40030	39970	40030	40030	32030	25980	21010
					IPM(FEED)	126	158	221	315	378	441	441	451	431



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

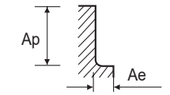
D-POWER GRAPHITE END MILLS

RECOMMENDED CUTTING CONDITIONS

EIB06 SERIES — 4 FLUTE CORNER RADIUS - SIDE CUTTING

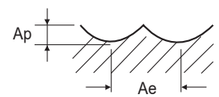
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/32	3/64	1/16	5/64	1/8	5/32	3/16	1/4	5/16	3/89	1/2
N	29.2	Non Metallic Materials	0.3D	0.3D	SFM(Vc)	325	490	655	820	1310	1635	1965	2620	2620	230	2750
					IPT(fz)	.0003	.0004	.0006	.0007	.0010	.0014	.0017	.0019	.0024	.0030	.0036
					RPM	39730	39930	40030	40090	40030	39970	40030	40030	32030	26070	21010
					IPM(FEED)	44	66	88	110	154	221	265	309	309	316	301



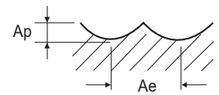
EI880, EI451, EI450 SERIES — 2 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2	2.5	3	3.5	4	5	6	8	10	12
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM(Vc)	330	410	495	575	660	800	930	1070	1185	1300
					IPT(fz)	.0010	.0014	.0018	.0022	.0026	.0032	.0039	.0046	.0052	.0059
					RPM	16010	15910	16010	15940	16010	15520	15040	12980	11500	10510
					IPM(FEED)	32	44	57	69	83	100	116	118	120	124



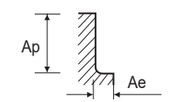
EI881 SERIES — 3 FLUTE BALL NOSE - SURFACING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2	2.5	3	3.5	4	5	6	8	10	12
N	29.2	Non Metallic Materials	0.2D	0.2D	SFM(Vc)	330	410	495	575	660	800	930	1070	1185	1300
					IPT(fz)	.0010	.0014	.0018	.0022	.0025	.0032	.0039	.0046	.0053	.0059
					RPM	16010	15910	16010	15940	16010	15520	15040	12980	11500	10510
					IPM(FEED)	47	67	85	104	122	150	175	177	181	187

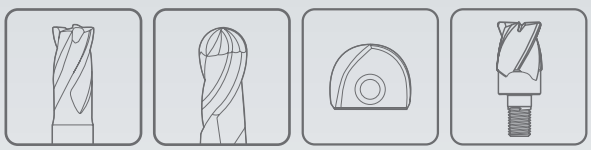


EI107 SERIES — 4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/64	1/8	3/16	1/4	5/16	3/8	1/2
N	29.2	Non Metallic Materials	0.3D	0.3D	SFM(Vc)	165	1310	1965	2620	2620	2550	2620
					IPT(fz)	.0002	.0004	.0008	.0012	.0015	.0020	.0024
					RPM	40340	40030	40030	40030	32030	25980	20020
					IPM(FEED)	32	63	126	189	197	205	189



Global Cutting Tool Leader **YG-1**



MILLING

Leading Through Innovation

SOLID CARBIDE

STANDARD CARBIDE END MILLS

- General Purpose

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
STANDARD CARBIDE END MILLS
General Purpose

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C778

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc
P	1	Non-alloy steel	About 0.15% C	Annealed	125	
	2		About 0.45% C	Annealed	190	13
	3		About 0.45% C	Quenched & Tempered	250	25
	4		About 0.75% C	Annealed	270	28
	5		About 0.75% C	Quenched & Tempered	300	32
	6	Low alloy steel		Annealed	180	10
	7			Quenched & Tempered	275	29
	8			Quenched & Tempered	300	32
	9			Quenched & Tempered	350	38
	10	High alloyed steel, and tool steel		Annealed	200	15
	11			Quenched & Tempered	325	35
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15
	13		Martensitic	Quenched & Tempered	240	23
	14		Austenitic		180	10
K	15	Grey cast iron	Pearlitic / ferritic		180	10
	16		Pearlitic (Martensitic)		260	26
	17	Nodular cast iron	Ferritic		160	3
	18		Pearlitic		250	25
	19	Malleable cast iron	Ferritic		130	
	20		Pearlitic		230	21
N	21	Aluminum-wrought alloy	Not Curable		60	
	22		Curable	Hardened	100	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75	
	24		≤ 12% Si, Curable	Hardened	90	
	25		> 12% Si, Not Curable		130	
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110	
	27		CuZn, CuSnZn (Brass)		90	
	28		CuSn, lead-free copper and electrolytic copper		100	
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic			
	30		Rubber, Wood, etc.			
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15
	32			Cured	280	30
	33		Ni or Co Based	Annealed	250	25
	34			Cured	350	38
	35			Cast	320	34
	36	Titanium Alloys	Pure Titanium		400 Rm	
	37		Alpha + Beta Alloys	Hardened	1050 Rm	
H	38	Hardened steel		Hardened	550	55
	39			Hardened	630	60
	40	Chilled Cast Iron		Cast	400	42
	41	Hardened Cast Iron		Hardened	550	55

Inch						
SERIES	UGMF90	E5020	UGMF89	E5021	E5244	UGMGF57
FLUTE	2	2	4	4	2	4
HELIX ANGLE	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D1/8	D1/32	D1/16	D1/16	D1/16	D1/16
SIZE MAX	D1	D1	D1	D1	D3/4	D3/4
PAGE	C738	C739	C740	C741	C742	C743
	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH	STUB LENGTH	STUB LENGTH
	Y-Coating	Uncoated	Y-Coating	Uncoated	Uncoated	Y-Coating
		TiN		TiN	TiN	
		TiCN		TiCN	TiCN	
		TYLON F		TYLON F	TYLON F	
		TYLON E		TYLON E	TYLON E	
	◎	◎	◎	◎	◎	◎
	◎	◎	◎	◎	◎	◎
	◎	◎	◎	◎	◎	◎
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	○	○	○	○	○	○

SELECTION GUIDE

YG MILLING TOOLS

SOLID CARBIDE
STANDARD CARBIDE END MILLS
General Purpose

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C778

						Inch					
					SERIES	E5060	E5018	E5062	E5251 E5252	E5216	E5069
					FLUTE	4	2	4	2&4	4	5
					HELIX ANGLE	30°	30°	30°	30°	30°	45°
					CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	BALL NOSE	BALL NOSE	CORNER RADIUS	CORNER RADIUS
					SIZE MIN	R1/16	R1/16	R1/16	R7/64	D1/8	D1/4
					SIZE MAX	R1/2	R1/2	R1/2	R1/4	D1	D1
					PAGE	C757	C758	C759	C760	C761	C763
						LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	STUB LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH
						Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
						TiN	TiN	TiN	TiN	TYLON F	
						TiCN	TiCN	TiCN	TiCN		
						TYLON F	TYLON F	TYLON F	TYLON F		
						TYLON E	TYLON E	TYLON E	TYLON E		
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc						
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15					○	◎
	13		Martensitic	Quenched & Tempered	240	23					○	◎
	14		Austenitic		180	10					○	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	○	○	○	○	○
	16		Pearlitic (Martensitic)		260	26	○	○	○	○	○	○
	17	Nodular cast iron	Ferritic		160	3	○	○	○	○	○	○
	18		Pearlitic		250	25	○	○	○	○	○	○
	19	Malleable cast iron	Ferritic		130		○	○	○	○	○	○
	20		Pearlitic		230	21	○	○	○	○	○	○
N	21	Aluminum-wrought alloy	Not Curable		60		○	○	○	○	○	
	22		Curable	Hardened	100		○	○	○	○	○	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		○	○	○	○	○	
	24		≤ 12% Si, Curable	Hardened	90		○	○	○	○	○	
	25		> 12% Si, Not Curable		130		○	○	○	○	○	
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110						○	○
	27		CuZn, CuSnZn (Brass)		90						○	○
	28		CuSn, lead-free copper and electrolytic copper		100						○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic									
	30		Rubber, Wood, etc.									
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15						○
	32			Cured	280	30						○
	33		Ni or Co Based	Annealed	250	25						○
	34			Cured	350	38						○
	35			Cast	320	34						○
	36	Titanium Alloys	Pure Titanium		400 Rm							○
	37		Alpha + Beta Alloys	Hardened	1050 Rm							○
H	38	Hardened steel		Hardened	550	55						
	39			Hardened	630	60						
	40	Chilled Cast Iron		Cast	400	42						○
	41	Hardened Cast Iron		Hardened	550	55						

Inch											Metric			
E5243	E5059	E5246	E5066	E5067	E5068	E5073	E5058	E5056 E5057	E5077	E5078	EH527	EH540	EH882	
3	3	3	5	5	5	5	6	5	3	3	2	4	3	
45°	50°	60°	45°	45°	45°	45°	40°	45°	30°	30°	≈30°	≈30°	35°	
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	ROUGHING	TAPER	TAPER BALL NOSE	SQUARE	SQUARE	CORNER RADIUS	
D1/8	D1/4	D1/8	D1/8	D1/8	D1/4	D5/16	D3/16	D3/8	D3/32	R.047	D3.5	D3.5	D3.0	
D1	D3/4	D1	D1	D1	D1	D1	D3/4	D1	D1/4	R.125	D20.0	D20.0	D20.0	
C764	C765	C766	C767	C768	C769	C770	C771	C772	C773	C774	C775	C776	C777	
REGULAR LENGTH	STUB & REGULAR & LONG LENGTH	REGULAR LENGTH	STUB LENGTH	REGULAR LENGTH	MEDIUM & LONG LENGTH	EXTRA LONG LENGTH	REGULAR LENGTH	STUB & REGULAR LENGTH	-	-	LONG LENGTH	LONG LENGTH	-	
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	TiAlN	TiAlN	TiAlN	
TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN				
TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN				
TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F	TYLON F				
TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E	TYLON E				
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CARBIDE END MILLS

PLAIN SHANK **UGMF90** SERIES

CARBIDE, 2 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 2 | 30° | PLAIN p.C780

Unit : Inch

EDP No. Y-Coating	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMF90008	1/8	1/8	1/2	1-1/2
UGMF90012	3/16	3/16	5/8	2
UGMF90016	1/4	1/4	3/4	2-1/2
UGMF90024	3/8	3/8	1	2-1/2
UGMF90032	1/2	1/2	1	3
UGMF90040	5/8	5/8	1-1/4	3-1/2
UGMF90048	3/4	3/4	1-1/2	4
UGMF90064	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P													M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230			
Recommended	◎	◎	◎	◎	○	◎	◎	○	◎	◎	○	○	○	○	○	○	○	○	○	○			

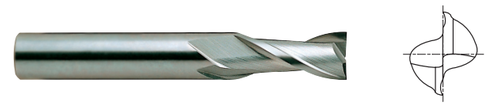
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE END MILLS

PLAIN SHANK **E5020** SERIES

CARBIDE, 2 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE | 2 | 30° | PLAIN p.C782

Unit : Inch

EDP No. UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
01552	01552TN	01552TC	01552TF	01552TE	1/32	1/8	5/64	1-1/2
01553	01553TN	01553TC	01553TF	01553TE	3/64	1/8	7/64	1-1/2
01554	01554TN	01554TC	01554TF	01554TE	1/16	1/8	3/16	1-1/2
01555	01555TN	01555TC	01555TF	01555TE	5/64	1/8	3/16	1-1/2
01556	01556TN	01556TC	01556TF	01556TE	3/32	1/8	3/8	1-1/2
01557	01557TN	01557TC	01557TF	01557TE	7/64	1/8	3/8	1-1/2
01558	01558TN	01558TC	01558TF	01558TE	1/8	1/8	1/2	1-1/2
01560	01560TN	01560TC	01560TF	01560TE	9/64	3/16	1/2	2
01562	01562TN	01562TC	01562TF	01562TE	5/32	3/16	9/16	2
01564	01564TN	01564TC	01564TF	01564TE	11/64	3/16	5/8	2
01565	01565TN	01565TC	01565TF	01565TE	3/16	3/16	5/8	2
01569	01569TN	01569TC	01569TF	01569TE	13/64	1/4	5/8	2-1/2
01570	01570TN	01570TC	01570TF	01570TE	7/32	1/4	5/8	2-1/2
01572	01572TN	01572TC	01572TF	01572TE	15/64	1/4	3/4	2-1/2
01573	01573TN	01573TC	01573TF	01573TE	1/4	1/4	3/4	2-1/2
01579	01579TN	01579TC	01579TF	01579TE	5/16	5/16	13/16	2-1/2
01584	01584TN	01584TC	01584TF	01584TE	3/8	3/8	1	2-1/2
01588	01588TN	01588TC	01588TF	01588TE	7/16	7/16	1	2-3/4
01593	01593TN	01593TC	01593TF	01593TE	1/2	1/2	1	3
01595	01595TN	01595TC	01595TF	01595TE	5/8	5/8	1-1/4	3-1/2
01598	01598TN	01598TC	01598TF	01598TE	3/4	3/4	1-1/2	4
01600	01600TN	01600TC	01600TF	01600TE	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P													M				K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20			
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21			
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230			
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○			

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE END MILLS

PLAIN SHANK **UGMF89** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 4 | 30° | PLAIN p.C779

Unit : Inch

EDP No. Y-Coating	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMF89004	1/16	1/8	3/16	1-1/2
UGMF89005	5/64	1/8	3/16	1-1/2
UGMF89006	3/32	1/8	3/8	1-1/2
UGMF89007	7/64	1/8	3/8	1-1/2
UGMF89008	1/8	1/8	1/2	1-1/2
UGMF89009	9/64	3/16	1/2	2
UGMF89010	5/32	3/16	9/16	2
UGMF89011	11/64	3/16	5/8	2
UGMF89012	3/16	3/16	5/8	2
UGMF89013	13/64	1/4	5/8	2-1/2
UGMF89014	7/32	1/4	5/8	2-1/2
UGMF89015	15/64	1/4	3/4	2-1/2
UGMF89016	1/4	1/4	3/4	2-1/2
UGMF89018	9/32	5/16	3/4	2-1/2
UGMF89020	5/16	5/16	13/16	2-1/2
UGMF89024	3/8	3/8	1	2-1/2
UGMF89028	7/16	7/16	1	2-3/4
UGMF89032	1/2	1/2	1	3
UGMF89036	9/16	9/16	1-1/4	3-1/2
UGMF89040	5/8	5/8	1-1/4	3-1/2
UGMF89048	3/4	3/4	1-1/2	4
UGMF89056	7/8	7/8	1-1/2	4
UGMF89064	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P																			M				K							
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron												
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20											
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21											
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230											
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○											

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

CARBIDE END MILLS

PLAIN SHANK **E5021** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- Possible for high-speed cutting, suitable for high efficiency maching for hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 4 | 30° | PLAIN p.C784

Unit : Inch

EDP No. UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
07554	07554TN	07554TC	07554TF	07554TE	1/16	1/8	3/16	1-1/2
07555	07555TN	07555TC	07555TF	07555TE	5/64	1/8	3/16	1-1/2
07556	07556TN	07556TC	07556TF	07556TE	3/32	1/8	3/8	1-1/2
07557	07557TN	07557TC	07557TF	07557TE	7/64	1/8	3/8	1-1/2
07558	07558TN	07558TC	07558TF	07558TE	1/8	1/8	1/2	1-1/2
07560	07560TN	07560TC	07560TF	07560TE	9/64	3/16	1/2	2
07561	07561TN	07561TC	07561TF	07561TE	5/32	3/16	9/16	2
07564	07564TN	07564TC	07564TF	07564TE	11/64	3/16	5/8	2
07565	07565TN	07565TC	07565TF	07565TE	3/16	3/16	5/8	2
07569	07569TN	07569TC	07569TF	07569TE	13/64	1/4	5/8	2-1/2
07570	07570TN	07570TC	07570TF	07570TE	7/32	1/4	5/8	2-1/2
07572	07572TN	07572TC	07572TF	07572TE	15/64	1/4	3/4	2-1/2
07573	07573TN	07573TC	07573TF	07573TE	1/4	1/4	3/4	2-1/2
07576	07576TN	07576TC	07576TF	07576TE	9/32	5/16	3/4	2-1/2
07579	07579TN	07579TC	07579TF	07579TE	5/16	5/16	13/16	2-1/2
07584	07584TN	07584TC	07584TF	07584TE	3/8	3/8	1	2-1/2
07588	07588TN	07588TC	07588TF	07588TE	7/16	7/16	1	2-3/4
07593	07593TN	07593TC	07593TF	07593TE	1/2	1/2	1	3
07595	07595TN	07595TC	07595TF	07595TE	5/8	5/8	1-1/4	3-1/2
07598	07598TN	07598TC	07598TF	07598TE	3/4	3/4	1-1/2	4
07600	07600TN	07600TC	07600TF	07600TE	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **E5244** SERIES

CARBIDE, 2 FLUTE STUB LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 2 30° PLAIN p.C782

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
30554	30554TN	30554TC	30554TF	30554TE	1/16	1/8	1/8	1-1/2
30556	30556TN	30556TC	30556TF	30556TE	3/32	1/8	3/16	1-1/2
30558	30558TN	30558TC	30558TF	30558TE	1/8	1/8	1/4	1-1/2
30561	30561TN	30561TC	30561TF	30561TE	5/32	3/16	5/16	2
30565	30565TN	30565TC	30565TF	30565TE	3/16	3/16	3/8	2
30570	30570TN	30570TC	30570TF	30570TE	7/32	1/4	7/16	2
30573	30573TN	30573TC	30573TF	30573TE	1/4	1/4	1/2	2
30579	30579TN	30579TC	30579TF	30579TE	5/16	5/16	1/2	2
30584	30584TN	30584TC	30584TF	30584TE	3/8	3/8	5/8	2
30588	30588TN	30588TC	30588TF	30588TE	7/16	7/16	5/8	2-1/2
30593	30593TN	30593TC	30593TF	30593TE	1/2	1/2	5/8	2-1/2
30595	30595TN	30595TC	30595TF	30595TE	5/8	5/8	3/4	3
30598	30598TN	30598TC	30598TF	30598TE	3/4	3/4	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **UGMGF57** SERIES

CARBIDE, 4 FLUTE STUB LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 4 30° PLAIN p.C779

Unit : Inch

EDP No. Y-Coating	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMGF57004	1/16	1/8	1/8	1-1/2
UGMGF57006	3/32	1/8	3/16	1-1/2
UGMGF57008	1/8	1/8	1/4	1-1/2
UGMGF57010	5/32	3/16	5/16	2
UGMGF57012	3/16	3/16	3/8	2
UGMGF57014	7/32	1/4	7/16	2
UGMGF57016	1/4	1/4	1/2	2
UGMGF57020	5/16	5/16	1/2	2
UGMGF57024	3/8	3/8	5/8	2
UGMGF57028	7/16	7/16	5/8	2-1/2
UGMGF57032	1/2	1/2	5/8	2-1/2
UGMGF57040	5/8	5/8	3/4	3
UGMGF57048	3/4	3/4	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE END MILLS

PLAIN SHANK **E5245** SERIES

CARBIDE, 4 FLUTE STUB LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 4 | 30° | PLAIN | p.C784

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
31554	31554TN	31554TC	31554TF	31554TE	1/16	1/8	1/8	1-1/2
31556	31556TN	31556TC	31556TF	31556TE	3/32	1/8	3/16	1-1/2
31558	31558TN	31558TC	31558TF	31558TE	1/8	1/8	1/4	1-1/2
31561	31561TN	31561TC	31561TF	31561TE	5/32	3/16	5/16	2
31565	31565TN	31565TC	31565TF	31565TE	3/16	3/16	3/8	2
31570	31570TN	31570TC	31570TF	31570TE	7/32	1/4	7/16	2
31573	31573TN	31573TC	31573TF	31573TE	1/4	1/4	1/2	2
31579	31579TN	31579TC	31579TF	31579TE	5/16	5/16	1/2	2
31584	31584TN	31584TC	31584TF	31584TE	3/8	3/8	5/8	2
31588	31588TN	31588TC	31588TF	31588TE	7/16	7/16	5/8	2-1/2
31593	31593TN	31593TC	31593TF	31593TE	1/2	1/2	5/8	2-1/2
31595	31595TN	31595TC	31595TF	31595TE	5/8	5/8	3/4	3
31598	31598TN	31598TC	31598TF	31598TE	3/4	3/4	1	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

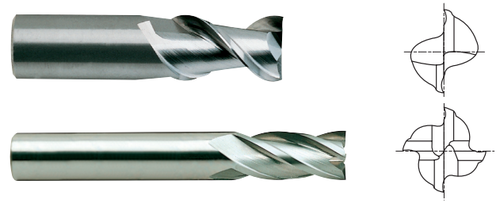
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE END MILLS

PLAIN SHANK **E5011** SERIES
PLAIN SHANK **E5012** SERIES

CARBIDE, 2&4 FLUTE LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE | 2&4 | 30° | PLAIN | p.C782, C784

E5011 Series ■ 2 FLUTE

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
02558	02558TN	02558TC	02558TF	02558TE	1/8	1/8	3/4	2-1/4
02565	02565TN	02565TC	02565TF	02565TE	3/16	3/16	3/4	2-1/2
02573	02573TN	02573TC	02573TF	02573TE	1/4	1/4	1-1/8	3
02579	02579TN	02579TC	02579TF	02579TE	5/16	5/16	1-1/8	3
02584	02584TN	02584TC	02584TF	02584TE	3/8	3/8	1-1/8	3
02588	02588TN	02588TC	02588TF	02588TE	7/16	7/16	2	4
02593	02593TN	02593TC	02593TF	02593TE	1/2	1/2	2	4
02595	02595TN	02595TC	02595TF	02595TE	5/8	5/8	2-1/4	5
02598	02598TN	02598TC	02598TF	02598TE	3/4	3/4	2-1/4	5
02600	02600TN	02600TC	02600TF	02600TE	1	1	2-1/4	5

E5012 Series ■ 4 FLUTE

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
08558	08558TN	08558TC	08558TF	08558TE	1/8	1/8	3/4	2-1/4
08565	08565TN	08565TC	08565TF	08565TE	3/16	3/16	3/4	2-1/2
08573	08573TN	08573TC	08573TF	08573TE	1/4	1/4	1-1/8	3
08579	08579TN	08579TC	08579TF	08579TE	5/16	5/16	1-1/8	3
08584	08584TN	08584TC	08584TF	08584TE	3/8	3/8	1-1/8	3
08588	08588TN	08588TC	08588TF	08588TE	7/16	7/16	2	4
08593	08593TN	08593TC	08593TF	08593TE	1/2	1/2	2	4
08595	08595TN	08595TC	08595TF	08595TE	5/8	5/8	2-1/4	5
08598	08598TN	08598TC	08598TF	08598TE	3/4	3/4	2-1/4	5
08600	08600TN	08600TC	08600TF	08600TE	1	1	2-1/4	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **UGMGF58** SERIES

CARBIDE, 4 FLUTE LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 4 30° PLAIN p.C779

Unit : Inch

EDP No. Y-Coating	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMGF58008	1/8	1/8	3/4	2-1/4
UGMGF58012	3/16	3/16	3/4	2-1/2
UGMGF58016	1/4	1/4	1-1/8	3
UGMGF58020	5/16	5/16	1-1/8	3
UGMGF58024	3/8	3/8	1-1/8	3
UGMGF58028	7/16	7/16	2	4
UGMGF58032	1/2	1/2	2	4
UGMGF58040	5/8	5/8	2-1/4	5
UGMGF58048	3/4	3/4	2-1/4	5
UGMGF58064	1	1	2-1/4	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P																			M				K								
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron													
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20													
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21													
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230													
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○													
ISO	N											S									H												
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys				Hardened steel		Chilled Cast Iron	Hardened Cast Iron									
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41												
HRc											15	30	25	38	34			55	60	42	55												
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550												
Recommended	○	○	○	○	○	○	○	○																									

YG CARBIDE END MILLS

PLAIN SHANK **E5026** SERIES

CARBIDE, 2 FLUTE EXTRA LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 2 30° PLAIN p.C782

Unit : Inch

EDP No. UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
54558	54558TN	54558TC	54558TF	54558TE	1/8	1/8	1	3
54565	54565TN	54565TC	54565TF	54565TE	3/16	3/16	1-1/8	3
54904	54904TN	54904TC	54904TF	54904TE	3/16	3/16	1	4
54573	54573TN	54573TC	54573TF	54573TE	1/4	1/4	1-1/2	4
54901	54901TN	54901TC	54901TF	54901TE	1/4	1/4	1-1/2	6
54579	54579TN	54579TC	54579TF	54579TE	5/16	5/16	1-5/8	4
54584	54584TN	54584TC	54584TF	54584TE	3/8	3/8	1-3/4	4
54902	54902TN	54902TC	54902TF	54902TE	3/8	3/8	1-1/2	6
54588	54588TN	54588TC	54588TF	54588TE	7/16	7/16	3	6
54903	54903TN	54903TC	54903TF	54903TE	1/2	1/2	1-1/2	6
54593	54593TN	54593TC	54593TF	54593TE	1/2	1/2	3	6
54595	54595TN	54595TC	54595TF	54595TE	5/8	5/8	3	6
54598	54598TN	54598TC	54598TF	54598TE	3/4	3/4	3	6
54600	54600TN	54600TC	54600TF	54600TE	1	1	3	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P																			M				K								
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron													
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20													
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21													
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230													
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○													
ISO	N											S									H												
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys					Titanium Alloys				Hardened steel		Chilled Cast Iron	Hardened Cast Iron									
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41												
HRc											15	30	25	38	34			55	60	42	55												
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550												
Recommended	○	○	○	○	○	○	○	○																									

CARBIDE END MILLS

PLAIN SHANK **UGMGF59 SERIES**

CARBIDE, 4 FLUTE EXTRA LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 4 30° PLAIN p.C779

Unit : Inch

EDP No. Y-Coating	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMGF59008	1/8	1/8	1	3
UGMGF59012	3/16	3/16	1-1/8	3
UGMGF59016	1/4	1/4	1-1/2	4
UGMGF59020	5/16	5/16	1-5/8	4
UGMGF59024	3/8	3/8	1-3/4	4
UGMGF59028	7/16	7/16	3	6
UGMGF59032	1/2	1/2	3	6
UGMGF59040	5/8	5/8	3	6
UGMGF59048	3/4	3/4	3	6
UGMGF59064	1	1	3	6
UGMGF59901	1/4	1/4	1-1/2	6
UGMGF59902	3/8	3/8	1-1/2	6
UGMGF59903	1/2	1/2	1-1/2	6
UGMGF59904	3/16	3/16	1	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P																			M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron								
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○									
ISO	N										S							H											
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron									
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41								
HRc											15	30	25	38	34			55	60	42	55								
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550								
Recommended	○	○	○	○	○	○	○	○																					

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

CARBIDE END MILLS

PLAIN SHANK **E5065 SERIES**

CARBIDE, 4 FLUTE EXTRA LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 4 30° PLAIN p.C784

Unit : Inch

EDP No. UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
55558	55558TN	55558TC	55558TF	55558TE	1/8	1/8	1	3
55565	55565TN	55565TC	55565TF	55565TE	3/16	3/16	1-1/8	3
55904	55904TN	55904TC	55904TF	55904TE	3/16	3/16	1	4
55573	55573TN	55573TC	55573TF	55573TE	1/4	1/4	1-1/2	4
55901	55901TN	55901TC	55901TF	55901TE	1/4	1/4	1-1/2	6
55579	55579TN	55579TC	55579TF	55579TE	5/16	5/16	1-5/8	4
55584	55584TN	55584TC	55584TF	55584TE	3/8	3/8	1-3/4	4
55902	55902TN	55902TC	55902TF	55902TE	3/8	3/8	1-1/2	6
55588	55588TN	55588TC	55588TF	55588TE	7/16	7/16	3	6
55903	55903TN	55903TC	55903TF	55903TE	1/2	1/2	1-1/2	6
55593	55593TN	55593TC	55593TF	55593TE	1/2	1/2	3	6
55595	55595TN	55595TC	55595TF	55595TE	5/8	5/8	3	6
55598	55598TN	55598TC	55598TF	55598TE	3/4	3/4	3	6
55600	55600TN	55600TC	55600TF	55600TE	1	1	3	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

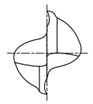
ISO	P																			M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron								
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20									
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21									
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230									
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○									
ISO	N										S							H											
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron									
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41								
HRc											15	30	25	38	34			55	60	42	55								
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550								
Recommended	○	○	○	○	○	○	○	○																					

YG CARBIDE END MILLS

PLAIN SHANK **E5022** SERIES

CARBIDE, 2 FLUTE STUB LENGTH DOUBLE

- Same construction features as 2&4 flute single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 2 30° PLAIN p.C782

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
32552	32552TN	32552TC	32552TF	32552TE	1/32	1/8	1/16	1-1/2
32553	32553TN	32553TC	32553TF	32553TE	3/64	1/8	3/32	1-1/2
32554	32554TN	32554TC	32554TF	32554TE	1/16	1/8	1/8	1-1/2
32555	32555TN	32555TC	32555TF	32555TE	5/64	1/8	1/8	1-1/2
32556	32556TN	32556TC	32556TF	32556TE	3/32	1/8	3/16	1-1/2
32557	32557TN	32557TC	32557TF	32557TE	7/64	1/8	3/16	1-1/2
32558	32558TN	32558TC	32558TF	32558TE	1/8	1/8	1/4	1-1/2
32560	32560TN	32560TC	32560TF	32560TE	9/64	3/16	5/16	2
32562	32562TN	32562TC	32562TF	32562TE	5/32	3/16	5/16	2
32564	32564TN	32564TC	32564TF	32564TE	11/64	3/16	5/16	2
32565	32565TN	32565TC	32565TF	32565TE	3/16	3/16	3/8	2
32569	32569TN	32569TC	32569TF	32569TE	13/64	1/4	1/2	2-1/2
32570	32570TN	32570TC	32570TF	32570TE	7/32	1/4	1/2	2-1/2
32572	32572TN	32572TC	32572TF	32572TE	15/64	1/4	1/2	2-1/2
32573	32573TN	32573TC	32573TF	32573TE	1/4	1/4	1/2	2-1/2
32579	32579TN	32579TC	32579TF	32579TE	5/16	5/16	1/2	2-1/2
32584	32584TN	32584TC	32584TF	32584TE	3/8	3/8	9/16	2-1/2
32588	32588TN	32588TC	32588TF	32588TE	7/16	7/16	9/16	2-3/4
32593	32593TN	32593TC	32593TF	32593TE	1/2	1/2	5/8	3

Mill Dia. Tolerance (inch)	
0~-.0012	* * 0~-.0020

* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel	Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **E5023** SERIES

CARBIDE, 4 FLUTE STUB LENGTH DOUBLE

- Same construction features as 2&4 flute single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 4 30° PLAIN p.C784

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
33554	33554TN	33554TC	33554TF	33554TE	1/16	1/8	1/8	1-1/2
33555	33555TN	33555TC	33555TF	33555TE	5/64	1/8	1/8	1-1/2
33556	33556TN	33556TC	33556TF	33556TE	3/32	1/8	3/16	1-1/2
33557	33557TN	33557TC	33557TF	33557TE	7/64	1/8	3/16	1-1/2
33558	33558TN	33558TC	33558TF	33558TE	1/8	1/8	1/4	1-1/2
33560	33560TN	33560TC	33560TF	33560TE	9/64	3/16	5/16	2
33561	33561TN	33561TC	33561TF	33561TE	5/32	3/16	5/16	2
33564	33564TN	33564TC	33564TF	33564TE	11/64	3/16	5/16	2
33565	33565TN	33565TC	33565TF	33565TE	3/16	3/16	3/8	2
33569	33569TN	33569TC	33569TF	33569TE	13/64	1/4	1/2	2-1/2
33570	33570TN	33570TC	33570TF	33570TE	7/32	1/4	1/2	2-1/2
33572	33572TN	33572TC	33572TF	33572TE	15/64	1/4	1/2	2-1/2
33573	33573TN	33573TC	33573TF	33573TE	1/4	1/4	1/2	2-1/2
33579	33579TN	33579TC	33579TF	33579TE	5/16	5/16	1/2	2-1/2
33584	33584TN	33584TC	33584TF	33584TE	3/8	3/8	9/16	2-1/2
33588	33588TN	33588TC	33588TF	33588TE	7/16	7/16	9/16	2-3/4
33593	33593TN	33593TC	33593TF	33593TE	1/2	1/2	5/8	3

Mill Dia. Tolerance (inch)	
0~-.0012	* * 0~-.0020

* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel	Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

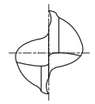
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

FLAT SHANK **E5025** SERIES

CARBIDE, 2 FLUTE REGULAR LENGTH DOUBLE

- Same construction features as single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE 2 30° FLAT p.C782

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
11559	11559TN	11559TC	11559TF	11559TE	1/8	3/8	3/8	3-1/16
11563	11563TN	11563TC	11563TF	11563TE	5/32	3/8	7/16	3-1/8
11567	11567TN	11567TC	11567TF	11567TE	3/16	3/8	1/2	3-1/4
11571	11571TN	11571TC	11571TF	11571TE	7/32	3/8	9/16	3-3/8
11574	11574TN	11574TC	11574TF	11574TE	1/4	3/8	5/8	3-3/8
11577	11577TN	11577TC	11577TF	11577TE	9/32	3/8	11/16	3-3/8
11580	11580TN	11580TC	11580TF	11580TE	5/16	3/8	3/4	3-1/2
11582	11582TN	11582TC	11582TF	11582TE	11/32	3/8	3/4	3-1/2
11584	11584TN	11584TC	11584TF	11584TE	3/8	3/8	3/4	3-1/2
11589	11589TN	11589TC	11589TF	11589TE	7/16	1/2	7/8	4
11593	11593TN	11593TC	11593TF	11593TE	1/2	1/2	1	4

Mill Dia. Tolerance (inch)	
0~-.0012	* * 0~-.0020

* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

FLAT SHANK **E5024** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH DOUBLE

- Same construction features as single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE 4 30° FLAT p.C784

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
13559	13559TN	13559TC	13559TF	13559TE	1/8	3/8	3/8	3-1/16
13563	13563TN	13563TC	13563TF	13563TE	5/32	3/8	7/16	3-1/8
13567	13567TN	13567TC	13567TF	13567TE	3/16	3/8	1/2	3-1/4
13571	13571TN	13571TC	13571TF	13571TE	7/32	3/8	9/16	3-3/8
13574	13574TN	13574TC	13574TF	13574TE	1/4	3/8	5/8	3-3/8
13577	13577TN	13577TC	13577TF	13577TE	9/32	3/8	11/16	3-3/8
13580	13580TN	13580TC	13580TF	13580TE	5/16	3/8	3/4	3-1/2
13582	13582TN	13582TC	13582TF	13582TE	11/32	3/8	3/4	3-1/2
13584	13584TN	13584TC	13584TF	13584TE	3/8	3/8	3/4	3-1/2
13589	13589TN	13589TC	13589TF	13589TE	7/16	1/2	7/8	4
13593	13593TN	13593TC	13593TF	13593TE	1/2	1/2	1	4

Mill Dia. Tolerance (inch)	
0~-.0012	* * 0~-.0020

* The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE END MILLS

PLAIN SHANK **E5249** SERIES

CARBIDE, 2 FLUTE REGULAR LENGTH BALL NOSE

▶Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 2 | 30° | R ±.0008 | PLAIN | p.C786

Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
41558	**41558TN**	**41558TC**	**41558TF**	**41558TE**	R1/16	**1/8**	1/8	1/2	1-1/2
41561	**41561TN**	**41561TC**	**41561TF**	**41561TE**	R5/64	**5/32**	3/16	9/16	2
41565	**41565TN**	**41565TC**	**41565TF**	**41565TE**	R3/32	**3/16**	3/16	5/8	2
41570	**41570TN**	**41570TC**	**41570TF**	**41570TE**	R7/64	**7/32**	1/4	5/8	2-1/2
41573	**41573TN**	**41573TC**	**41573TF**	**41573TE**	R1/8	**1/4**	1/4	3/4	2-1/2
41579	**41579TN**	**41579TC**	**41579TF**	**41579TE**	R5/32	**5/16**	5/16	13/16	2-1/2
41584	**41584TN**	**41584TC**	**41584TF**	**41584TE**	R3/16	**3/8**	3/8	1	2-1/2
41588	**41588TN**	**41588TC**	**41588TF**	**41588TE**	R7/32	**7/16**	7/16	1	2-3/4
41593	**41593TN**	**41593TC**	**41593TF**	**41593TE**	R1/4	**1/2**	1/2	1	3
41595	**41595TN**	**41595TC**	**41595TF**	**41595TE**	R5/16	**5/8**	5/8	1-1/4	3-1/2
41598	**41598TN**	**41598TC**	**41598TF**	**41598TE**	R3/8	**3/4**	3/4	1-1/2	4
41600	**41600TN**	**41600TC**	**41600TF**	**41600TE**	R1/2	**1**	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

CARBIDE END MILLS

PLAIN SHANK **E5250** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE

▶Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 4 | 30° | R ±.0008 | PLAIN | p.C788

Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
43558	**43558TN**	**43558TC**	**43558TF**	**43558TE**	R1/16	**1/8**	1/8	1/2	1-1/2
43561	**43561TN**	**43561TC**	**43561TF**	**43561TE**	R5/64	**5/32**	3/16	9/16	2
43565	**43565TN**	**43565TC**	**43565TF**	**43565TE**	R3/32	**3/16**	3/16	5/8	2
43570	**43570TN**	**43570TC**	**43570TF**	**43570TE**	R7/64	**7/32**	1/4	5/8	2-1/2
43573	**43573TN**	**43573TC**	**43573TF**	**43573TE**	R1/8	**1/4**	1/4	3/4	2-1/2
43579	**43579TN**	**43579TC**	**43579TF**	**43579TE**	R5/32	**5/16**	5/16	13/16	2-1/2
43584	**43584TN**	**43584TC**	**43584TF**	**43584TE**	R3/16	**3/8**	3/8	1	2-1/2
43588	**43588TN**	**43588TC**	**43588TF**	**43588TE**	R7/32	**7/16**	7/16	1	2-3/4
43593	**43593TN**	**43593TC**	**43593TF**	**43593TE**	R1/4	**1/2**	1/2	1	3
43595	**43595TN**	**43595TC**	**43595TF**	**43595TE**	R5/16	**5/8**	5/8	1-1/4	3-1/2
43598	**43598TN**	**43598TC**	**43598TF**	**43598TE**	R3/8	**3/4**	3/4	1-1/2	4
43600	**43600TN**	**43600TC**	**43600TF**	**43600TE**	R1/2	**1**	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

CARBIDE END MILLS

PLAIN SHANK **UGMF91** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

Only available till stock runs out

CARBIDE | 4 | 30° | PLAIN | R ±.0008 | p.C781

Unit : Inch

EDP No. Y-Coating	Radiusof BallNose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UGMF91008	R1/16	1/8	1/8	1/2	1-1/2
UGMF91010	R5/64	5/32	3/16	9/16	2
UGMF91012	R3/32	3/16	3/16	5/8	2
UGMF91016	R1/8	1/4	1/4	3/4	2-1/2
UGMF91020	R5/32	5/16	5/16	13/16	2-1/2
UGMF91024	R3/16	3/8	3/8	1	2-1/2
UGMF91028	R7/32	7/16	7/16	1	2-3/4
UGMF91032	R1/4	1/2	1/2	1	3
UGMF91040	R5/16	5/8	5/8	1-1/4	3-1/2
UGMF91048	R3/8	3/4	3/4	1-1/2	4
UGMF91064	R1/2	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

CARBIDE END MILLS

PLAIN SHANK **E5014** SERIES

PLAIN SHANK **E5060** SERIES

CARBIDE, 2&4 FLUTE LONG LENGTH BALL NOSE

- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 2&4 | 30° | R ±.0008 | PLAIN | p.C786, C788

E5014 Series ■ 2 FLUTE

Unit : Inch

EDP No. UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
50558	50558TN	50558TC	50558TF	50558TE	R1/16	1/8	1/8	3/4	2-1/4
50565	50565TN	50565TC	50565TF	50565TE	R3/32	3/16	3/16	3/4	2-1/2
50573	50573TN	50573TC	50573TF	50573TE	R1/8	1/4	1/4	1-1/8	3
50579	50579TN	50579TC	50579TF	50579TE	R5/32	5/16	5/16	1-1/8	3
50584	50584TN	50584TC	50584TF	50584TE	R3/16	3/8	3/8	1-1/8	3
50588	50588TN	50588TC	50588TF	50588TE	R7/32	7/16	7/16	2	4
50593	50593TN	50593TC	50593TF	50593TE	R1/4	1/2	1/2	2	4
50595	50595TN	50595TC	50595TF	50595TE	R5/16	5/8	5/8	2-1/4	5
50598	50598TN	50598TC	50598TF	50598TE	R3/8	3/4	3/4	2-1/4	5
50600	50600TN	50600TC	50600TF	50600TE	R1/2	1	1	2-1/4	5

E5060 Series ■ 4 FLUTE

Unit : Inch

EDP No. UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	Radius of Ball Nose R (±.0008)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
51558	51558TN	51558TC	51558TF	51558TE	R1/16	1/8	1/8	3/4	2-1/4
51565	51565TN	51565TC	51565TF	51565TE	R3/32	3/16	3/16	3/4	2-1/2
51573	51573TN	51573TC	51573TF	51573TE	R1/8	1/4	1/4	1-1/8	3
51579	51579TN	51579TC	51579TF	51579TE	R5/32	5/16	5/16	1-1/8	3
51584	51584TN	51584TC	51584TF	51584TE	R3/16	3/8	3/8	1-1/8	3
51588	51588TN	51588TC	51588TF	51588TE	R7/32	7/16	7/16	2	4
51593	51593TN	51593TC	51593TF	51593TE	R1/4	1/2	1/2	2	4
51595	51595TN	51595TC	51595TF	51595TE	R5/16	5/8	5/8	2-1/4	5
51598	51598TN	51598TC	51598TF	51598TE	R3/8	3/4	3/4	2-1/4	5
51600	51600TN	51600TC	51600TF	51600TE	R1/2	1	1	2-1/4	5

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

CARBIDE END MILLS

PLAIN SHANK **E5018** SERIES

CARBIDE, 2 FLUTE EXTRA LONG LENGTH BALL NOSE

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 2 | 30° | R ±.0008 | PLAIN | p.C786

Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
52558	**52558TN**	**52558TC**	**52558TF**	**52558TE**	R1/16	**1/8**	1/8	1	3
52565	**52565TN**	**52565TC**	**52565TF**	**52565TE**	R3/32	**3/16**	3/16	1-1/8	3
52904	**52904TN**	**52904TC**	**52904TF**	**52904TE**	R3/32	**3/16**	3/16	1	4
52573	**52573TN**	**52573TC**	**52573TF**	**52573TE**	R1/8	**1/4**	1/4	1-1/2	4
52901	**52901TN**	**52901TC**	**52901TF**	**52901TE**	R1/8	**1/4**	1/4	1-1/2	6
52579	**52579TN**	**52579TC**	**52579TF**	**52579TE**	R5/32	**5/16**	5/16	1-5/8	4
52584	**52584TN**	**52584TC**	**52584TF**	**52584TE**	R3/16	**3/8**	3/8	1-3/4	4
52902	**52902TN**	**52902TC**	**52902TF**	**52902TE**	R3/16	**3/8**	3/8	1-1/2	6
52588	**52588TN**	**52588TC**	**52588TF**	**52588TE**	R7/32	**7/16**	7/16	3	6
52903	**52903TN**	**52903TC**	**52903TF**	**52903TE**	R1/4	**1/2**	1/2	1-1/2	6
52593	**52593TN**	**52593TC**	**52593TF**	**52593TE**	R1/4	**1/2**	1/2	3	6
52595	**52595TN**	**52595TC**	**52595TF**	**52595TE**	R5/16	**5/8**	5/8	3	6
52598	**52598TN**	**52598TC**	**52598TF**	**52598TE**	R3/8	**3/4**	3/4	3	6
52600	**52600TN**	**52600TC**	**52600TF**	**52600TE**	R1/2	**1**	1	3	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

CARBIDE END MILLS

PLAIN SHANK **E5062** SERIES

CARBIDE, 4 FLUTE EXTRA LONG LENGTH BALL NOSE

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 4 | 30° | R ±.0008 | PLAIN | p.C788

Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
53558	**53558TN**	**53558TC**	**53558TF**	**53558TE**	R1/16	**1/8**	1/8	1	3
53565	**53565TN**	**53565TC**	**53565TF**	**53565TE**	R3/32	**3/16**	3/16	1-1/8	3
53573	**53573TN**	**53573TC**	**53573TF**	**53573TE**	R1/8	**1/4**	1/4	1-1/2	4
53901	**53901TN**	**53901TC**	**53901TF**	**53901TE**	R1/8	**1/4**	1/4	1-1/2	6
53579	**53579TN**	**53579TC**	**53579TF**	**53579TE**	R5/32	**5/16**	5/16	1-5/8	4
53584	**53584TN**	**53584TC**	**53584TF**	**53584TE**	R3/16	**3/8**	3/8	1-3/4	4
53902	**53902TN**	**53902TC**	**53902TF**	**53902TE**	R3/16	**3/8**	3/8	1-1/2	6
53588	**53588TN**	**53588TC**	**53588TF**	**53588TE**	R7/32	**7/16**	7/16	3	6
53903	**53903TN**	**53903TC**	**53903TF**	**53903TE**	R1/4	**1/2**	1/2	1-1/2	6
53593	**53593TN**	**53593TC**	**53593TF**	**53593TE**	R1/4	**1/2**	1/2	3	6
53595	**53595TN**	**53595TC**	**53595TF**	**53595TE**	R5/16	**5/8**	5/8	3	6
53904	**53904TN**	**53904TC**	**53904TF**	**53904TE**	R5/16	**5/8**	5/8	1-1/2	6
53598	**53598TN**	**53598TC**	**53598TF**	**53598TE**	R3/8	**3/4**	3/4	3	6
53905	**53905TN**	**53905TC**	**53905TF**	**53905TE**	R3/8	**3/4**	3/4	1-1/2	6
53600	**53600TN**	**53600TC**	**53600TF**	**53600TE**	R1/2	**1**	1	3	6
53906	**53906TN**	**53906TC**	**53906TF**	**53906TE**	R1/2	**1**	1	1-1/2	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

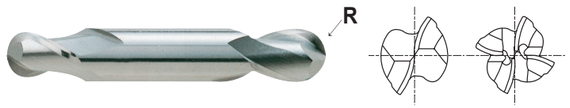
YG CARBIDE END MILLS

PLAIN SHANK **E5251** SERIES

PLAIN SHANK **E5252** SERIES

CARBIDE, 2&4 FLUTE STUB LENGTH DOUBLE BALL NOSE

- Same construction features as single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



CARBIDE | 2&4 | 30° | R ±.0008 | PLAIN

p.C786, C788

E5251 Series ■ 2 FLUTE

Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
47570	**47570TN**	**47570TC**	**47570TF**	**47570TE**	R7/64	**7/32**	1/4	1/2	2-1/2
47573	**47573TN**	**47573TC**	**47573TF**	**47573TE**	R1/8	**1/4**	1/4	1/2	2-1/2
47579	**47579TN**	**47579TC**	**47579TF**	**47579TE**	R5/32	**5/16**	5/16	1/2	2-1/2
47584	**47584TN**	**47584TC**	**47584TF**	**47584TE**	R3/16	**3/8**	3/8	9/16	2-1/2
47588	**47588TN**	**47588TC**	**47588TF**	**47588TE**	R7/32	**7/16**	7/16	9/16	2-3/4
47593	**47593TN**	**47593TC**	**47593TF**	**47593TE**	R1/4	**1/2**	1/2	5/8	3

E5252 Series ■ 4 FLUTE

Unit : Inch

EDP No.					Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)				
48570	**48570TN**	**48570TC**	**48570TF**	**48570TE**	R7/64	**7/32**	1/4	1/2	2-1/2
48573	**48573TN**	**48573TC**	**48573TF**	**48573TE**	R1/8	**1/4**	1/4	1/2	2-1/2
48579	**48579TN**	**48579TC**	**48579TF**	**48579TE**	R5/32	**5/16**	5/16	1/2	2-1/2
48584	**48584TN**	**48584TC**	**48584TF**	**48584TE**	R3/16	**3/8**	3/8	9/16	2-1/2
48588	**48588TN**	**48588TC**	**48588TF**	**48588TE**	R7/32	**7/16**	7/16	9/16	2-3/4
48593	**48593TN**	**48593TC**	**48593TF**	**48593TE**	R1/4	**1/2**	1/2	5/8	3

Mill Dia. Tolerance (inch)	
0~-.0012	* * 0~-.0020

*The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○																

YG CARBIDE END MILLS

PLAIN SHANK **E5216** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 4 | 30° | R ±.001 | PLAIN

p.C784

Unit : Inch

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	YG:TYLON F	R				
07558-015R	**07558TF-015R**	R.015	**1/8**	1/8	1/2	1-1/2
07558-030R	**07558TF-030R**	R.030	**1/8**	1/8	1/2	1-1/2
07565-015R	**07565TF-015R**	R.015	**3/16**	3/16	5/8	2
07565-030R	**07565TF-030R**	R.030	**3/16**	3/16	5/8	2
07573-015R	**07573TF-015R**	R.015	**1/4**	1/4	3/4	2-1/2
07573-030R	**07573TF-030R**	R.030	**1/4**	1/4	3/4	2-1/2
07573-045R	**07573TF-045R**	R.045	**1/4**	1/4	3/4	2-1/2
07579-015R	**07579TF-015R**	R.015	**5/16**	5/16	13/16	2-1/2
07579-030R	**07579TF-030R**	R.030	**5/16**	5/16	13/16	2-1/2
07579-045R	**07579TF-045R**	R.045	**5/16**	5/16	13/16	2-1/2
07584-015R	**07584TF-015R**	R.015	**3/8**	3/8	1	2-1/2
07584-030R	**07584TF-030R**	R.030	**3/8**	3/8	1	2-1/2
07584-045R	**07584TF-045R**	R.045	**3/8**	3/8	1	2-1/2
07584-060R	**07584TF-060R**	R.060	**3/8**	3/8	1	2-1/2
07588-015R	**07588TF-015R**	R.015	**7/16**	7/16	1	2-3/4
07588-030R	**07588TF-030R**	R.030	**7/16**	7/16	1	2-3/4
07588-045R	**07588TF-045R**	R.045	**7/16**	7/16	1	2-3/4
07588-060R	**07588TF-060R**	R.060	**7/16**	7/16	1	2-3/4
07588-090R	**07588TF-090R**	R.090	**7/16**	7/16	1	2-3/4
07593-015R	**07593TF-015R**	R.015	**1/2**	1/2	1	3
07593-030R	**07593TF-030R**	R.030	**1/2**	1/2	1	3
07593-045R	**07593TF-045R**	R.045	**1/2**	1/2	1	3
07593-060R	**07593TF-060R**	R.060	**1/2**	1/2	1	3
07593-090R	**07593TF-090R**	R.090	**1/2**	1/2	1	3

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P										M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **E5216** SERIES

CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.

CARBIDE | 4 | 30° | R ±.001 | PLAIN p.C784

Unit : Inch

EDP No. UNCOATED	EDP No. YG:TYLON F	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
07593-125R	07593TF-125R	R.125	1/2	1/2	1	3
07595-015R	07595TF-015R	R.015	5/8	5/8	1-1/4	3-1/2
07595-030R	07595TF-030R	R.030	5/8	5/8	1-1/4	3-1/2
07595-045R	07595TF-045R	R.045	5/8	5/8	1-1/4	3-1/2
07595-060R	07595TF-060R	R.060	5/8	5/8	1-1/4	3-1/2
07595-090R	07595TF-090R	R.090	5/8	5/8	1-1/4	3-1/2
07595-125R	07595TF-125R	R.125	5/8	5/8	1-1/4	3-1/2
07598-015R	07598TF-015R	R.015	3/4	3/4	1-1/2	4
07598-030R	07598TF-030R	R.030	3/4	3/4	1-1/2	4
07598-045R	07598TF-045R	R.045	3/4	3/4	1-1/2	4
07598-060R	07598TF-060R	R.060	3/4	3/4	1-1/2	4
07598-090R	07598TF-090R	R.090	3/4	3/4	1-1/2	4
07598-125R	07598TF-125R	R.125	3/4	3/4	1-1/2	4
07600-015R	07600TF-015R	R.015	1	1	1-1/2	4
07600-030R	07600TF-030R	R.030	1	1	1-1/2	4
07600-045R	07600TF-045R	R.045	1	1	1-1/2	4
07600-060R	07600TF-060R	R.060	1	1	1-1/2	4
07600-090R	07600TF-090R	R.090	1	1	1-1/2	4
07600-125R	07600TF-125R	R.125	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **E5069** SERIES

CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH CORNER RADIUS

Designed to machine stainless steels, Inconols and other alloys.
5 Flute and 45° medium helix allow harmonic balance and smooth cutting.

CARBIDE | 5 | 45° | R ±.001 | PLAIN p.C778

Unit : Inch

EDP No. UNCOATED	Corner Radius R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
86573TF-030R	R.030	1/4	1/4	3/4	2-1/2
86584TF-030R	R.030	3/8	3/8	1	2-1/2
86584TF-060R	R.060	3/8	3/8	1	2-1/2
86593TF-030R	R.030	1/2	1/2	1-1/4	3
86593TF-060R	R.060	1/2	1/2	1-1/4	3
86593TF-090R	R.090	1/2	1/2	1-1/4	3
86595TF-030R	R.030	5/8	5/8	1-5/8	3-1/2
86595TF-060R	R.060	5/8	5/8	1-5/8	3-1/2
86595TF-090R	R.090	5/8	5/8	1-5/8	3-1/2
86595TF-125R	R.125	5/8	5/8	1-5/8	3-1/2
86598TF-030R	R.030	3/4	3/4	1-5/8	4
86598TF-060R	R.060	3/4	3/4	1-5/8	4
86598TF-090R	R.090	3/4	3/4	1-5/8	4
86598TF-125R	R.125	3/4	3/4	1-5/8	4
86598TF-156R	R.156	3/4	3/4	1-5/8	4
86598TF-187R	R.187	3/4	3/4	1-5/8	4
86600TF-030R	R.030	1	1	2	4
86600TF-060R	R.060	1	1	2	4
86600TF-090R	R.090	1	1	2	4
86600TF-125R	R.125	1	1	2	4
86600TF-156R	R.156	1	1	2	4
86600TF-187R	R.187	1	1	2	4

* Any non stocked radius available in 1 week for uncoated tools.

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

YG CARBIDE END MILLS

PLAIN SHANK
FLAT SHANK
E5243 SERIES

CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH

- ▶Designed to machine stainless steel, inconel, titanium and other hard to machine materials.
- ▶It's 3 flute design gives high stability and allows good chip removal in plunging & slotting operations.
- ▶The normal rake angle and 45° medium helix allows an extremely wide range of application.
- ▶YG:TYLON super TiAlN coating are recommended for maximum performance.

CARBIDE | 3 | 45° | PLAIN | FLAT

Ø1/8~Ø5/16 Ø3/8~Ø1

p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
34558	34558TN	34558TC	34558TF	34558TE	1/8	1/8	3/8	1-1/2
34565	34565TN	34565TC	34565TF	34565TE	3/16	3/16	9/16	2
34573	34573TN	34573TC	34573TF	34573TE	1/4	1/4	3/4	2-1/2
34579	34579TN	34579TC	34579TF	34579TE	5/16	5/16	13/16	2-1/2
34584	34584TN	34584TC	34584TF	34584TE	3/8	3/8	7/8	2-1/2
34593	34593TN	34593TC	34593TF	34593TE	1/2	1/2	1	3
34594	34594TN	34594TC	34594TF	34594TE	9/16	9/16	1-1/4	3-1/2
34595	34595TN	34595TC	34595TF	34595TE	5/8	5/8	1-1/4	3-1/2
34598	34598TN	34598TC	34598TF	34598TE	3/4	3/4	1-1/2	4
34600	34600TN	34600TC	34600TF	34600TE	1	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

YG CARBIDE END MILLS

PLAIN SHANK
E5059 SERIES

CARBIDE, 3 FLUTE 50° HELIX STUB & REGULAR & LONG LENGTH

- ▶Designed to machine stainless steel, inconel, titanium and other hard to machine materials.
- ▶It's 3 flute design gives high stability and allows good chip removal in plunging & slotting operations.
- ▶The high rake angle and 50° helix allows an extremely wide range of application.
- ▶YG:TYLON super TiAlN coating are recommended for maximum performance.

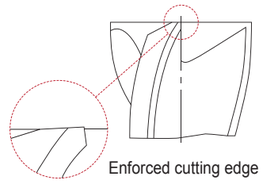
CARBIDE | 3 | 50° | PLAIN

p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
83573	83573TN	83573TC	83573TF	83573TE	1/4	1/4	1/2	2
83901	83901TN	83901TC	83901TF	83901TE	1/4	1/4	3/4	2-1/2
83902	83902TN	83902TC	83902TF	83902TE	1/4	1/4	1-1/4	3
83584	83584TN	83584TC	83584TF	83584TE	3/8	3/8	1/2	2
83903	83903TN	83903TC	83903TF	83903TE	3/8	3/8	1	2-1/2
83904	83904TN	83904TC	83904TF	83904TE	3/8	3/8	1-1/2	3-1/2
83593	83593TN	83593TC	83593TF	83593TE	1/2	1/2	5/8	2-1/2
83905	83905TN	83905TC	83905TF	83905TE	1/2	1/2	1	3
83906	83906TN	83906TC	83906TF	83906TE	1/2	1/2	2	4
83595	83595TN	83595TC	83595TF	83595TE	5/8	5/8	7/8	3
83907	83907TN	83907TC	83907TF	83907TE	5/8	5/8	2-1/2	6
83598	83598TN	83598TC	83598TF	83598TE	3/4	3/4	1	3-1/2
83908	83908TN	83908TC	83908TF	83908TE	3/4	3/4	3	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

CARBIDE END MILLS

PLAIN SHANK
FLAT SHANK
E5246 SERIES

CARBIDE, 3 FLUTE 60° HELIX REGULAR LENGTH

- Excellent shearing and chip ejection due to 60° Helix.
- 20%～ 30% increase in chip load recommended over 30° helix tools.

CARBIDE | 3 | 60° | PLAIN | FLAT

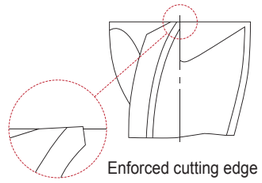
Ø1/8~Ø5/16 Ø3/8~Ø1

p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
20558	**20558TN**	**20558TC**	**20558TF**	**20558TE**	**1/8**	1/8	3/8	1-1/2
20565	**20565TN**	**20565TC**	**20565TF**	**20565TE**	**3/16**	3/16	9/16	2
20573	**20573TN**	**20573TC**	**20573TF**	**20573TE**	**1/4**	1/4	3/4	2-1/2
20579	**20579TN**	**20579TC**	**20579TF**	**20579TE**	**5/16**	5/16	13/16	2-1/2
20584	**20584TN**	**20584TC**	**20584TF**	**20584TE**	**3/8**	3/8	7/8	2-1/2
20593	**20593TN**	**20593TC**	**20593TF**	**20593TE**	**1/2**	1/2	1	3
20594	**20594TN**	**20594TC**	**20594TF**	**20594TE**	**9/16**	9/16	1-1/4	3-1/2
20595	**20595TN**	**20595TC**	**20595TF**	**20595TE**	**5/8**	5/8	1-1/4	3-1/2
20598	**20598TN**	**20598TC**	**20598TF**	**20598TE**	**3/4**	3/4	1-1/2	4
20600	**20600TN**	**20600TC**	**20600TF**	**20600TE**	**1**	1	1-1/2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

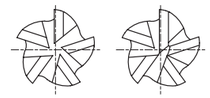
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

CARBIDE END MILLS

PLAIN SHANK
E5066 SERIES

CARBIDE, 5 FLUTE 45° HELIX STUB LENGTH

- Designed to machine stainless steels, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



up to Ø3/16 over Ø3/16

CARBIDE | 5 | 45° | PLAIN

p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
85558	**85558TN**	**85558TC**	**85558TF**	**85558TE**	**1/8**	1/8	1/4	1-1/2
85561	**85561TN**	**85561TC**	**85561TF**	**85561TE**	**5/32**	3/16	5/16	2
85565	**85565TN**	**85565TC**	**85565TF**	**85565TE**	**3/16**	3/16	5/16	2
85570	**85570TN**	**85570TC**	**85570TF**	**85570TE**	**7/32**	1/4	3/8	2
85573	**85573TN**	**85573TC**	**85573TF**	**85573TE**	**1/4**	1/4	3/8	2
85579	**85579TN**	**85579TC**	**85579TF**	**85579TE**	**5/16**	5/16	7/16	2
85584	**85584TN**	**85584TC**	**85584TF**	**85584TE**	**3/8**	3/8	1/2	2
85588	**85588TN**	**85588TC**	**85588TF**	**85588TE**	**7/16**	7/16	9/16	2-1/2
85593	**85593TN**	**85593TC**	**85593TF**	**85593TE**	**1/2**	1/2	5/8	2-1/2
85595	**85595TN**	**85595TC**	**85595TF**	**85595TE**	**5/8**	5/8	3/4	3
85598	**85598TN**	**85598TC**	**85598TF**	**85598TE**	**3/4**	3/4	1	3
85600	**85600TN**	**85600TC**	**85600TF**	**85600TE**	**1**	1	1-1/4	3

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

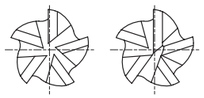
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

CARBIDE END MILLS

PLAIN SHANK **E5067** SERIES

CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH

- Designed to machine stainless steels, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



up to Ø3/16 over Ø3/16

CARBIDE 5 45° PLAIN p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
86558	86558TN	86558TC	86558TF	86558TE	1/8	1/8	1/2	1-1/2
86561	86561TN	86561TC	86561TF	86561TE	5/32	3/16	9/16	2
86565	86565TN	86565TC	86565TF	86565TE	3/16	3/16	9/16	2
86570	86570TN	86570TC	86570TF	86570TE	7/32	1/4	3/4	2-1/2
86573	86573TN	86573TC	86573TF	86573TE	1/4	1/4	3/4	2-1/2
86579	86579TN	86579TC	86579TF	86579TE	5/16	5/16	13/16	2-1/2
86584	86584TN	86584TC	86584TF	86584TE	3/8	3/8	1	2-1/2
86588	86588TN	86588TC	86588TF	86588TE	7/16	7/16	1	2-3/4
86593	86593TN	86593TC	86593TF	86593TE	1/2	1/2	1-1/4	3
86595	86595TN	86595TC	86595TF	86595TE	5/8	5/8	1-5/8	3-1/2
86598	86598TN	86598TC	86598TF	86598TE	3/4	3/4	1-5/8	4
86599	86599TN	86599TC	86599TF	86599TE	7/8	7/8	2	4
86600	86600TN	86600TC	86600TF	86600TE	1	1	2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

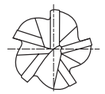
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

CARBIDE END MILLS

PLAIN SHANK **E5068** SERIES

CARBIDE, 5 FLUTE 45° HELIX MEDIUM & LONG LENGTH

- Designed to machine stainless steel, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.



CARBIDE 5 45° PLAIN p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
58573	58573TN	58573TC	58573TF	58573TE	1/4	1/4	1-1/4	4
58579	58579TN	58579TC	58579TF	58579TE	5/16	5/16	1-1/4	4
58584	58584TN	58584TC	58584TF	58584TE	3/8	3/8	1-1/2	4
58588	58588TN	58588TC	58588TF	58588TE	7/16	7/16	2	4
58593	58593TN	58593TC	58593TF	58593TE	1/2	1/2	2	4
58595	58595TN	58595TC	58595TF	58595TE	5/8	5/8	2-1/2	5
58598	58598TN	58598TC	58598TF	58598TE	3/4	3/4	3-1/4	6
58901	58901TN	58901TC	58901TF	58901TE	3/4	3/4	2-1/4	5
58600	58600TN	58600TC	58600TF	58600TE	1	1	3-1/4	6
58902	58902TN	58902TC	58902TF	58902TE	1	1	2-5/8	6

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

CARBIDE END MILLS

PLAIN SHANK **E5073** SERIES

CARBIDE, 5 FLUTE 45° HELIX EXTRA LONG LENGTH

- Designed to machine stainless steel, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.

CARBIDE | 5 | 45° | PLAIN p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
59579	59579TN	59579TC	59579TF	59579TE	5/16	5/16	2-1/8	4
59584	59584TN	59584TC	59584TF	59584TE	3/8	3/8	2-1/2	6
59593	59593TN	59593TC	59593TF	59593TE	1/2	1/2	3-1/8	6
59595	59595TN	59595TC	59595TF	59595TE	5/8	5/8	4	6
59598	59598TN	59598TC	59598TF	59598TE	3/4	3/4	4	6
59600	59600TN	59600TC	59600TF	59600TE	1	1	4-1/8	7

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0003

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

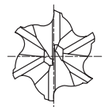
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

CARBIDE END MILLS

PLAIN SHANK **E5058** SERIES

CARBIDE, 6 FLUTE 40° HELIX REGULAR LENGTH

- For finishing in most materials.
- 20~40% increase in inches per minute over 4 flute tools.
- YG:TYLON SUPER TiAlN coating recommended for maximum performance.



CARBIDE | 6 | 40° | PLAIN p.C778

Unit : Inch

EDP No.					Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E				
84565	84565TN	84565TC	84565TF	84565TE	3/16	3/16	5/8	2
84573	84573TN	84573TC	84573TF	84573TE	1/4	1/4	3/4	2-1/2
84579	84579TN	84579TC	84579TF	84579TE	5/16	5/16	7/8	2-1/2
84584	84584TN	84584TC	84584TF	84584TE	3/8	3/8	7/8	2-1/2
84588	84588TN	84588TC	84588TF	84588TE	7/16	7/16	1	2-1/2
84593	84593TN	84593TC	84593TF	84593TE	1/2	1/2	1	3
84595	84595TN	84595TC	84595TF	84595TE	5/8	5/8	1-1/4	3-1/2
84598	84598TN	84598TC	84598TF	84598TE	3/4	3/4	1-1/2	4

MATERIAL HARDNESS		
Recommended Coating	Under HRc45 F	Over HRc45 E

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○			○	○	○	○	○	○	○			○	

YG CARBIDE END MILLS

FLAT SHANK **E5056** SERIES

FLAT SHANK **E5057** SERIES

CARBIDE, 5 FLUTE 45° HELIX STUB & REGULAR LENGTH FINE PITCH ROUGHING CORNER RADIUS

- ▶5 flute design gives minimum harmonic vibration.
- ▶Stub tools for minimum deflection and maximum rigidity.
- ▶Ideal for profile milling.
- ▶Not recommended for slotting.

CARBIDE | FINE | 5 | 45° | FLAT p.C778

E5056 Series ■ STUB LENGTH

Unit : Inch

EDP No.					Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R				
81584	81584TN	81584TC	81584TF	81584TE	R.040	3/8	3/8	1/2	2
81593	81593TN	81593TC	81593TF	81593TE	R.040	1/2	1/2	5/8	2-1/2
81595	81595TN	81595TC	81595TF	81595TE	R.060	5/8	5/8	3/4	3
81598	81598TN	81598TC	81598TF	81598TE	R.060	3/4	3/4	1	3
81600	81600TN	81600TC	81600TF	81600TE	R.060	1	1	1-1/4	3

E5057 Series ■ REGULAR LENGTH

Unit : Inch

EDP No.					Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R				
82584	82584TN	82584TC	82584TF	82584TE	R.040	3/8	3/8	1	2-1/2
82593	82593TN	82593TC	82593TF	82593TE	R.040	1/2	1/2	1-1/4	3
82595	82595TN	82595TC	82595TF	82595TE	R.060	5/8	5/8	1-5/8	3-1/2
82598	82598TN	82598TC	82598TF	82598TE	R.060	3/4	3/4	1-5/8	4
82600	82600TN	82600TC	82600TF	82600TE	R.060	1	1	2	4

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.003	0~-.0005

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																○	○			○	

YG CARBIDE END MILLS

PLAIN SHANK **E5077** SERIES

CARBIDE, 3 FLUTE TAPER

- ▶Designed for milling die cavity.
- ▶Many different center line angles are available on your job requirement.

CARBIDE | 3 | 30° | PLAIN p.C778

Unit : Inch

EDP No.					Cutting Small Diameter	Shank Diameter	Length of Cut	Overall Length	Center Ling Angle
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E					
87552	87552TN	87552TC	87552TF	87552TE	1/8	1/4	1-1/2	3	1°
87553	87553TN	87553TC	87553TF	87553TE	1/8	1/4	1-1/2	3	1.5°
87554	87554TN	87554TC	87554TF	87554TE	1/8	1/4	1-1/4	3	2°
87556	87556TN	87556TC	87556TF	87556TE	1/8	1/4	1	3	3°
87560	87560TN	87560TC	87560TF	87560TE	1/8	1/4	3/4	3	5°
87564	87564TN	87564TC	87564TF	87564TE	1/8	1/4	1/2	3	7°
87570	87570TN	87570TC	87570TF	87570TE	3/32	1/4	1/2	3	10°
87572	87572TN	87572TC	87572TF	87572TE	3/16	3/8	1-3/4	3-1/2	1°
87573	87573TN	87573TC	87573TF	87573TE	3/16	3/8	1-3/4	3-1/2	1.5°
87574	87574TN	87574TC	87574TF	87574TE	3/16	3/8	1-3/4	3-1/2	2°
87576	87576TN	87576TC	87576TF	87576TE	5/32	3/8	1-3/4	3-1/2	3°
87580	87580TN	87580TC	87580TF	87580TE	1/8	3/8	1-1/2	3-1/2	5°
87584	87584TN	87584TC	87584TF	87584TE	1/8	3/8	1	3-1/2	7°
87590	87590TN	87590TC	87590TF	87590TE	1/8	3/8	3/4	3-1/2	10°
87592	87592TN	87592TC	87592TF	87592TE	1/4	1/2	2	4	1°
87594	87594TN	87594TC	87594TF	87594TE	1/4	1/2	2	4	2°
87596	87596TN	87596TC	87596TF	87596TE	1/4	1/2	2	4	3°
87600	87600TN	87600TC	87600TF	87600TE	1/4	1/2	1-1/4	4	5°
87902	87902TN	87902TC	87902TF	87902TE	3/16	1/2	1-1/4	4	7°
87903	87903TN	87903TC	87903TF	87903TE	1/8	1/2	1	4	10°

Cutting Small Dia. Tolerance (mm)		Shank Dia. Tolerance	Center Line Angle Tolerance
Ø1/16 ~ Ø1/4	0~-.0020	0~-.0005	±5′
Ø17/64 ~ Ø1	0~-.0030		

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○												○	

YG CARBIDE END MILLS

PLAIN SHANK **E5078** SERIES

CARBIDE, 3 FLUTE TAPER BALL NOSE

▶Designed for milling die cavity.
▶Many different center line angles are available on your job requirement.

CARBIDE | 3 | 30° | R ±.0008 | PLAIN | p.C778

Unit : Inch

EDP No.					TIP Radius	Cutting Small Diameter	Shank Diameter	Length of Cut	Overall Length	Center Ling Angle
UNCOATED	TiN COATED	TiCN COATED	YG:TYLON F	YG:TYLON E	R (±.0008)					
88552	88552TN	88552TC	88552TF	88552TE	R.062	1/8	1/4	1-1/2	3	1°
88553	88553TN	88553TC	88553TF	88553TE	R.062	1/8	1/4	1-1/2	3	1.5°
88554	88554TN	88554TC	88554TF	88554TE	R.062	1/8	1/4	1-1/4	3	2°
88556	88556TN	88556TC	88556TF	88556TE	R.062	1/8	1/4	1	3	3°
88560	88560TN	88560TC	88560TF	88560TE	R.062	1/8	1/4	3/4	3	5°
88564	88564TN	88564TC	88564TF	88564TE	R.062	1/8	1/4	1/2	3	7°
88570	88570TN	88570TC	88570TF	88570TE	R.047	3/32	1/4	1/2	3	10°
88572	88572TN	88572TC	88572TF	88572TE	R.093	3/16	3/8	1-3/4	3-1/2	1°
88573	88573TN	88573TC	88573TF	88573TE	R.093	3/16	3/8	1-3/4	3-1/2	1.5°
88574	88574TN	88574TC	88574TF	88574TE	R.093	3/16	3/8	1-3/4	3-1/2	2°
88576	88576TN	88576TC	88576TF	88576TE	R.078	5/32	3/8	1-3/4	3-1/2	3°
88580	88580TN	88580TC	88580TF	88580TE	R.062	1/8	3/8	1-1/2	3-1/2	5°
88584	88584TN	88584TC	88584TF	88584TE	R.062	1/8	3/8	1	3-1/2	7°
88590	88590TN	88590TC	88590TF	88590TE	R.062	1/8	3/8	3/4	3-1/2	10°
88592	88592TN	88592TC	88592TF	88592TE	R.125	1/4	1/2	2	4	1°
88594	88594TN	88594TC	88594TF	88594TE	R.125	1/4	1/2	2	4	2°
88596	88596TN	88596TC	88596TF	88596TE	R.125	1/4	1/2	2	4	3°
88600	88600TN	88600TC	88600TF	88600TE	R.125	1/4	1/2	1-1/4	4	5°
88902	88902TN	88902TC	88902TF	88902TE	R.093	3/16	1/2	1-1/4	4	7°
88903	88903TN	88903TC	88903TF	88903TE	R.062	1/8	1/2	1	4	10°

Cutting Small Dia. Tolerance (mm)		Shank Dia. Tolerance	Center Line Angle Tolerance
Ø1/16 ~ Ø1/4	0~-.0020	0~-.0005	±5′
Ø17/64 ~ Ø1	0~-.0030		

◎ : Excellent ○ : Good

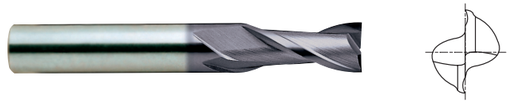
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○												○	

YG CARBIDE END MILLS

PLAIN SHANK **EH527** SERIES

CARBIDE, 2 FLUTE LONG LENGTH - TiAlN 'F' Coated



CARBIDE | DIN 6528 | N | 2 | 30° | DIN 6535HA | p.C790

Unit : mm

EDP No.	Mill Diameter		Shank Diameter	Length of Cut	Overall Length
	Metric	Inch			
	h10		h6		
EH527035	3.5	.1378	3.5	7	50
EH527040	4.0	.1575	4	8	50
EH527045	4.5	.1772	4.5	8	50
EH527050	5.0	.1969	5	10	50
EH527055	5.5	.2165	5.5	10	57
EH527060	6.0	.2362	6	10	57
EH527065	6.5	.2559	6.5	13	60
EH527070	7.0	.2756	7	13	60
EH527075	7.5	.2953	7.5	16	63
EH527080	8.0	.3150	8	16	63
EH527085	8.5	.3346	8.5	16	67
EH527090	9.0	.3543	9	16	67
EH527095	9.5	.3740	9.5	19	72
EH527100	10.0	.3937	10	19	72
EH527110	11.0	.4330	11	22	83
EH527120	12.0	.4724	12	22	83
EH527130	13.0	.5118	13	22	83
EH527140	14.0	.5512	14	22	83
EH527150	15.0	.5905	15	26	92
EH527160	16.0	.6299	16	26	92
EH527180	18.0	.7087	18	26	92
EH527200	20.0	.7874	20	32	104

Tolerances according to DIN 7160 & 7161

Tolerance range in µm					
Nominal-Diameter in mm					
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / − 40	0 / − 48	0 / − 58	0 / − 70	0 / − 84
h6	0 / − 6	0 / − 8	0 / − 9	0 / − 11	0 / − 13

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **EH540** SERIES

CARBIDE, 4 FLUTE LONG LENGTH - TiAlN 'F' Coated

CARBIDE | DIN 6528 | N | 4 | ≈ 30° | DIN 6535HA p.C791

Unit : mm

EDP No.	Mill Diameter Metric h10	Mill Diameter Inch h10	Shank Diameter h6	Length of Cut	Overall Length
EH540035	3.5	.1378	3.5	10	50
EH540040	4.0	.1575	4	11	50
EH540045	4.5	.1772	4.5	11	50
EH540050	5.0	.1969	5	13	50
EH540055	5.5	.2165	5.5	13	57
EH540060	6.0	.2362	6	13	57
EH540065	6.5	.2559	6.5	16	60
EH540070	7.0	.2756	7	16	60
EH540075	7.5	.2953	7.5	19	63
EH540080	8.0	.3150	8	19	63
EH540085	8.5	.3346	8.5	19	67
EH540090	9.0	.3543	9	19	67
EH540095	9.5	.3740	9.5	22	72
EH540100	10.0	.3937	10	22	72
EH540110	11.0	.4330	11	26	83
EH540120	12.0	.4724	12	26	83
EH540130	13.0	.5118	13	26	83
EH540140	14.0	.5512	14	26	83
EH540150	15.0	.5905	15	32	92
EH540160	16.0	.6299	16	32	92
EH540180	18.0	.7087	18	32	92
EH540200	20.0	.7874	20	38	104

Tolerances according to DIN 7160 & 7161

Tolerance range in μm, Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / − 40	0 / − 48	0 / − 58	0 / − 70	0 / − 84
h6	0 / − 6	0 / − 8	0 / − 9	0 / − 11	0 / − 13

◎ : Excellent ○ : Good

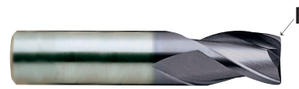
ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG CARBIDE END MILLS

PLAIN SHANK **EH882** SERIES

CARBIDE, 3 FLUTE 35° HELIX CORNER RADIUS - TiAlN 'F' Coated



CARBIDE | DIN 6527 | N | 3 | 35° | DIN 6535HA p.C778

Unit : mm

EDP No.	Corner Radius R	Mill Diameter Metric h10	Mill Diameter Inch h10	Shank Diameter h6	Length of Cut	Overall Length
EH882030	R.20-.25	3.0	.1181	3	4	38
EH882040	R.20-.25	4.0	.1575	6	5	54
EH882050	R.20-.25	5.0	.1969	6	6	54
EH882060	R.40-.50	6.0	.2362	6	7	54
EH882080	R.40-.50	8.0	.3150	8	9	58
EH882100	R.40-.50	10.0	.3937	10	11	66
EH882120	R.75-.85	12.0	.4724	12	12	73
EH882160	R.75-.85	16.0	.6299	16	16	82
EH882200	R.75-.85	20.0	.7874	20	20	92

* TiN & TiCN-COATING are available on your request.

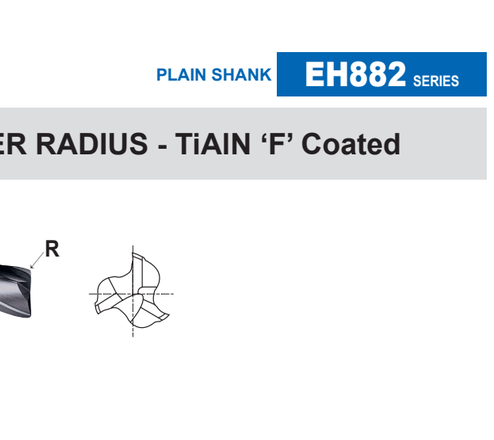
Tolerances according to DIN 7160 & 7161

Tolerance range in μm, Nominal-Diameter in mm	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30
h10	0 / − 40	0 / − 48	0 / − 58	0 / − 70	0 / − 84
h6	0 / − 6	0 / − 8	0 / − 9	0 / − 11	0 / − 13

TiAlN FEED CHART

Unit : inch

Mill Diameter	Feed / Tooth	Mill Diameter	Feed / Tooth
3	.0035 ~ .0070	10	.0018 ~ .0040
5	.0050 ~ .0025	12	.0025 ~ .0050
6	.0012 ~ .0030	16	.0030 ~ .0060
8	.0018 ~ .0035	20	.0035 ~ .0070



◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎				○		○	○	○	○

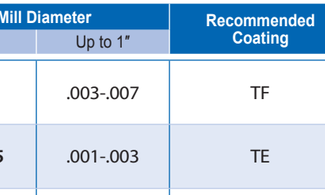
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎												○	

YG CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

SPEED & FEED RECOMMENDATIONS

Material	Speed	Chip Load per Tooth by End Mill Diameter			Recommended Coating
		Up to 1/4"	Up to 1/2"	Up to 1"	
Carbon + Alloy Steel <45Rc	100-700	.0002-.002	.001-.003	.003-.007	TF
Carbon + Alloy Steel >45Rc	50-400	.0002-.001	.0005-.0015	.001-.003	TE
Stainless Steels Non-Hardenable 200-300 Series	150-500	.0002-.001	.001-.002	.002-.006	TF
Stainless Steels Hardenable 400 Series Martensitic and PH Series	100-450	.0002-.0005	.0005-.001	.001-.005	TF
Cast+Ductile Iron	100-800	.0002-.0015	.002-.003	.003-.008	TF or TE
Nickel+Cobalt Based Alloys	20-200	.0003-.0008	.0008-.001	.001-.002	TE
Titanium	30-200	.0002-.0008	.0008-.002	.002-.004	TE
Aluminum	600-2000	.0002-.002	.002-.004	.004-.008	TiCN
Copper	300-1000	.0005-.002	.002-.003	.003-.006	CrN
Brass+ Bronze Alloys Graphite	600-1000 600-1000	.0005-.002 .0005-.005	.002-.003 .001-.008	.003-.006 .002-.010	TiCN D
Plastic	600-1200	.0006-.003	.003-.006	.006-.012	TF

TF = YG:TYLON F
TE = YG:TYLON E
D = DIAMOND
CrN = CHROME NITRIDE



SPEED & FEED DETERMINANTS
1. MATERIAL HARDNESS
2. MACHINE RIGIDITY
3. TYPE OF COATING
4. TOOL GEOMETRY
5. FINISH REQUIREMENTS
6. DEPTH & WIDTH OF CUT

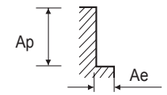
YG CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

UGMF89, UGMGF57 UGMGF58, UGMGF59 SERIES

4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)											
						1/16	5/64	3/32	7/64	1/8	9/64	5/32	11/64	3/16	13/64	7/32	15/64
P	1-2	Non-alloy steel	0.1D	1.5D	SFM(Vc)	185	205	225	215	200	195	190	185	175	185	190	195
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0012	.0013	.0013
					RPM	11200	10080	9070	7560	6050	5320	4590	4100	3600	3460	3310	3170
					IPM(FEED)	15	15	15	16	17	17	17	17	17	17	17	17
	3-4		0.1D	1.5D	SFM(Vc)	160	180	190	190	175	170	160	160	155	160	165	165
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0010	.0011	.0012	.0013	.0013	.0014
					RPM	9640	8680	7810	6550	5290	4600	3910	3530	3150	2990	2840	2680
					IPM(FEED)	13	13	13	14	15	15	15	15	15	15	15	15
	5		0.1D	1.5D	SFM(Vc)	130	150	160	155	140	140	135	130	125	130	135	135
					IPT(fz)	.0003	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0011	.0012	.0012
					RPM	8090	7280	6550	5420	4280	3780	3280	2900	2520	2430	2330	2240
					IPM(FEED)	10	10	10	11	11	11	11	11	11	11	11	11
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	185	205	225	215	200	195	190	185	175	185	190	195
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0012	.0013	.0013
					RPM	11200	10080	9070	7560	6050	5320	4590	4100	3600	3460	3310	3170
					IPM(FEED)	15	15	15	16	17	17	17	17	17	17	17	17
	7		0.1D	1.5D	SFM(Vc)	160	180	190	190	175	170	160	160	155	160	165	165
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0010	.0011	.0012	.0013	.0013	.0014
					RPM	9640	8680	7810	6550	5290	4600	3910	3530	3150	2990	2840	2680
					IPM(FEED)	13	13	13	14	15	15	15	15	15	15	15	15
	8-9		0.1D	1.5D	SFM(Vc)	130	150	160	155	140	140	135	130	125	130	135	135
					IPT(fz)	.0003	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0011	.0012	.0012
					RPM	8090	7280	6550	5420	4280	3780	3280	2900	2520	2430	2330	2240
					IPM(FEED)	10	10	10	11	11	11	11	11	11	11	11	11
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	185	205	225	215	200	195	190	185	175	185	190	195
					IPT(fz)	.0003	.0004	.0004	.0005	.0007	.0008	.0009	.0010	.0012	.0012	.0013	.0013
					RPM	11200	10080	9070	7560	6050	5320	4590	4100	3600	3460	3310	3170
					IPM(FEED)	15	15	15	16	17	17	17	17	17	17	17	17
	11.1		0.1D	1.5D	SFM(Vc)	130	150	160	155	140	140	135	130	125	130	135	135
					IPT(fz)	.0003	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0011	.0012	.0012
					RPM	8090	7280	6550	5420	4280	3780	3280	2900	2520	2430	2330	2240
					IPM(FEED)	10	10	10	11	11	11	11	11	11	11	11	11
M	12-13	Stainless steel	0.1D	1.5D	SFM(Vc)	255	285	310	305	285	280	270	265	260	270	275	280
					IPT(fz)	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007
					RPM	15560	14000	12600	10650	8690	7620	6550	5920	5290	5040	4790	4540
					IPM(FEED)	13	13	13	13	13	13	13	13	13	13	13	13
	14.1-14.2		0.1D	1.5D	SFM(Vc)	255	285	310	305	285	280	270	265	260	270	275	280
					IPT(fz)	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005	.0006	.0006	.0007	.0007
					RPM	15560	14000	12600	10650	8690	7620	6550	5920	5290	5040	4790	4540
					IPM(FEED)	13	13	13	13	13	13	13	13	13	13	13	13
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	215	245	265	255	225	225	215	215	205	210	215	220
					IPT(fz)	.0005	.0006	.0007	.0008	.0010	.0012	.0014	.0015	.0017	.0019	.0021	.0023
					RPM	13220	11900	10710	8820	6930	6110	5290	4730	4160	3970	3780	3590
					IPM(FEED)	29	29	29	29	29	29	29	29	29	30	32	33
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	510	575	620	615	575	555	515	520	515	535	550	560
					IPT(fz)	.0005	.0005	.0006	.0007	.0009	.0010	.0012	.0013	.0014	.0015	.0016	.0017
					RPM	31110	28000	25200	21420	17640	15120	12600	11530	10460	10020	9580	9140
					IPM(FEED)	60	60	60	60	60	60	60	60	60	61	62	63
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM(Vc)	380	430	465	450	410	415	410	405	385	400	410	420
					IPT(fz)	.0005	.0006	.0006	.0007	.0009	.0010	.0012	.0013	.0015	.0016	.0017	.0018
					RPM	23330	21000	18900	15750	12600	11340	10080	8950	7810	7500	7180	6870
					IPM(FEED)	47	47	47	47	47	47	47	47	47	47	48	49



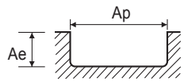
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

UGMF90 SERIES — 2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	200	175	200	175	200	185	190	195
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0027	.0031	.0033
					RPM	6050	3600	3020	1760	1510	1130	980	750
					IPM(FEED)	6	6	6	6	6	6	6	5
	3-4		1.0D	1.0D	SFM(Vc)	175	155	165	150	165	165	165	165
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0025	.0030	.0032
					RPM	5290	3150	2520	1510	1260	1010	830	630
					IPM(FEED)	5	5	5	5	5	5	5	4
	5		1.0D	1.0D	SFM(Vc)	140	125	140	125	140	135	135	140
					IPT(fz)	.0005	.0008	.0009	.0016	.0019	.0030	.0036	.0038
					RPM	4280	2520	2140	1260	1080	820	690	530
					IPM(FEED)	4	4	4	4	4	5	5	4
	6	Low alloy steel	1.0D	1.0D	SFM(Vc)	200	175	200	175	200	185	190	195
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0027	.0031	.0033
					RPM	6050	3600	3020	1760	1510	1130	980	750
					IPM(FEED)	6	6	6	6	6	6	6	5
	7		1.0D	1.0D	SFM(Vc)	175	155	165	150	165	165	165	165
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0025	.0030	.0032
					RPM	5290	3150	2520	1510	1260	1010	830	630
					IPM(FEED)	5	5	5	5	5	5	5	4
	8-9		1.0D	1.0D	SFM(Vc)	140	125	140	125	140	135	135	140
					IPT(fz)	.0005	.0008	.0009	.0016	.0019	.0030	.0036	.0038
					RPM	4280	2520	2140	1260	1080	820	690	530
					IPM(FEED)	4	4	4	4	4	5	5	4
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	200	175	200	175	200	185	190	195
					IPT(fz)	.0005	.0008	.0010	.0017	.0020	.0027	.0031	.0033
					RPM	6050	3600	3020	1760	1510	1130	980	750
					IPM(FEED)	6	6	6	6	6	6	6	5
	11.1		1.0D	1.0D	SFM(Vc)	140	125	140	125	140	135	135	140
					IPT(fz)	.0005	.0008	.0009	.0016	.0019	.0030	.0036	.0038
					RPM	4280	2520	2140	1260	1080	820	690	530
					IPM(FEED)	4	4	4	4	4	5	5	4
M	12-13	Stainless steel	1.0D	1.0D	SFM(Vc)	285	260	280	245	280	270	265	265
					IPT(fz)	.0002	.0004	.0005	.0008	.0009	.0015	.0019	.0020
					RPM	8690	5290	4280	2520	2140	1640	1350	1020
					IPM(FEED)	4	4	4	4	4	5	5	4
	14.1-14.2		1.0D	1.0D	SFM(Vc)	285	260	280	245	280	270	265	265
					IPT(fz)	.0002	.0004	.0005	.0008	.0009	.0015	.0019	.0020
					RPM	8690	5290	4280	2520	2140	1640	1350	1020
					IPM(FEED)	4	4	4	4	4	5	5	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	SFM(Vc)	225	205	225	210	215	205	215	225
					IPT(fz)	.0007	.0012	.0016	.0030	.0040	.0056	.0068	.0071
					RPM	6930	4160	3400	2140	1640	1260	1100	850
					IPM(FEED)	10	10	11	13	13	14	15	12
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	1.0D	SFM(Vc)	575	515	570	520	560	535	530	535
					IPT(fz)	.0006	.0010	.0013	.0021	.0026	.0034	.0041	.0044
					RPM	17640	10460	8690	5290	4280	3280	2710	2040
					IPM(FEED)	21	21	22	22	22	22	22	18
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	SFM(Vc)	410	385	430	385	430	410	410	415
					IPT(fz)	.0006	.0010	.0013	.0022	.0026	.0034	.0040	.0044
					RPM	12600	7810	6550	3910	3280	2520	2100	1590
					IPM(FEED)	15	15	17	17	17	17	17	14

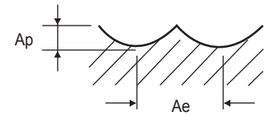


CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

UGMF91 SERIES — 4 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	185	165	180	160	180	175	190	200
					IPT(fz)	.0004	.0007	.0009	.0014	.0014	.0019	.0020	.0023
					RPM	5670	3400	2770	1640	1390	1070	980	770
					IPM(FEED)	10	10	10	9	8	8	8	7
	5		0.7D	0.3D	SFM(Vc)	155	135	155	135	155	145	155	165
					IPT(fz)	.0002	.0004	.0004	.0007	.0008	.0011	.0013	.0016
					RPM	4790	2770	2380	1390	1200	880	800	630
					IPM(FEED)	4	4	4	4	4	4	4	4
	6-7	Low alloy steel	0.7D	0.3D	SFM(Vc)	185	165	180	160	180	175	190	200
					IPT(fz)	.0004	.0007	.0009	.0014	.0014	.0019	.0020	.0023
					RPM	5670	3400	2770	1640	1390	1070	980	770
					IPM(FEED)	10	10	10	9	8	8	8	7
	8-9		0.7D	0.3D	SFM(Vc)	155	135	155	135	155	145	155	165
					IPT(fz)	.0002	.0004	.0004	.0007	.0008	.0011	.0013	.0016
					RPM	4790	2770	2380	1390	1200	880	800	630
					IPM(FEED)	4	4	4	4	4	4	4	4
	10	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	185	165	180	160	180	175	190	200
					IPT(fz)	.0004	.0007	.0009	.0014	.0014	.0019	.0020	.0023
					RPM	5670	3400	2770	1640	1390	1070	980	770
					IPM(FEED)	10	10	10	9	8	8	8	7
	11.1		0.7D	0.3D	SFM(Vc)	155	135	155	135	155	145	155	165
					IPT(fz)	.0002	.0004	.0004	.0007	.0008	.0011	.0013	.0016
					RPM	4790	2770	2380	1390	1200	880	800	630
					IPM(FEED)	4	4	4	4	4	4	4	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	265	235	255	235	265	245	260	265
					IPT(fz)	.0005	.0011	.0015	.0033	.0038	.0053	.0061	.0064
					RPM	8060	4790	3910	2380	2020	1510	1320	1020
					IPM(FEED)	15	22	24	31	31	32	32	26
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	765	680	775	695	775	720	790	825
					IPT(fz)	.0003	.0006	.0007	.0013	.0018	.0021	.0023	.0024
					RPM	23440	13860	11840	7060	5920	4410	4030	3160
					IPM(FEED)	27	32	32	37	43	37	37	30



CARBIDE END MILLS

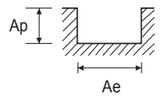
RECOMMENDED CUTTING CONDITIONS

E5020, E5244, E5011 E5026, E5022, E5025 SERIES

2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	13/16
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115
					IPT(fz)	.0003	.0005	.0007	.0009	.0011	.0014	.0018	.0022	.0025	.0029	.0036
					RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550
					IPM(FEED)	3	4	4	4	4	4	4	4	4	4	4
	3-4		1.0D	1.0D	SFM(Vc)	120	105	100	95	105	100	95	105	105	100	100
					IPT(fz)	.0003	.0005	.0006	.0008	.0009	.0013	.0016	.0019	.0021	.0025	.0031
					RPM	4800	3200	2400	1900	1600	1200	950	800	700	600	480
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3
	5		1.0D	1.0D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85
					IPT(fz)	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0015	.0018	.0030	.0038
					RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400
					IPM(FEED)	2	2	2	2	2	2	2	2	2	3	3
	6	Low alloy steel	1.0D	1.0D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115
					IPT(fz)	.0003	.0005	.0007	.0009	.0011	.0014	.0018	.0022	.0025	.0029	.0036
					RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550
					IPM(FEED)	3	4	4	4	4	4	4	4	4	4	4
	7		1.0D	1.0D	SFM(Vc)	120	105	100	95	105	100	95	105	105	100	100
					IPT(fz)	.0003	.0005	.0006	.0008	.0009	.0013	.0016	.0019	.0021	.0025	.0031
					RPM	4800	3200	2400	1900	1600	1200	950	800	700	600	480
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3
	8-9		1.0D	1.0D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85
					IPT(fz)	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0015	.0018	.0030	.0038
					RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400
					IPM(FEED)	2	2	2	2	2	2	2	2	2	3	3
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115
					IPT(fz)	.0003	.0005	.0007	.0009	.0011	.0014	.0018	.0022	.0025	.0029	.0036
					RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550
					IPM(FEED)	3	4	4	4	4	4	4	4	4	4	4
	11.1		1.0D	1.0D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85
					IPT(fz)	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0015	.0018	.0030	.0038
					RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400
					IPM(FEED)	2	2	2	2	2	2	2	2	2	3	3
M	12-13	Stainless steel	1.0D	1.0D	SFM(Vc)	195	175	165	155	170	165	155	170	160	165	170
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0009	.0012	.0014	.0015	.0019
					RPM	8000	5300	4000	3200	2600	2000	1600	1300	1100	1000	800
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3
	14.1-14.2		1.0D	1.0D	SFM(Vc)	195	175	165	155	170	165	155	170	160	165	170
					IPT(fz)	.0002	.0003	.0004	.0005	.0006	.0008	.0009	.0012	.0014	.0015	.0019
					RPM	8000	5300	4000	3200	2600	2000	1600	1300	1100	1000	800
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	SFM(Vc)	160	135	130	125	135	130	130	130	135	130	135
					IPT(fz)	.0005	.0007	.0009	.0012	.0017	.0025	.0031	.0040	.0050	.0056	.0078
					RPM	6500	4200	3200	2500	2100	1600	1300	1000	900	800	640
					IPM(FEED)	6	6	6	6	7	8	8	8	9	9	10
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	1.0D	SFM(Vc)	395	360	325	315	345	325	315	340	340	325	340
					IPT(fz)	.0004	.0006	.0008	.0010	.0012	.0016	.0020	.0025	.0028	.0033	.0041
					RPM	16000	11000	8000	6400	5300	4000	3200	2600	2300	2000	1600
					IPM(FEED)	13	13	13	13	13	13	13	13	13	13	13
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	SFM(Vc)	295	260	245	235	260	245	235	260	250	245	255
					IPT(fz)	.0004	.0006	.0008	.0010	.0013	.0017	.0021	.0025	.0029	.0033	.0042
					RPM	12000	8000	6000	4800	4000	3000	2400	2000	1700	1500	1200
					IPM(FEED)	10	10	10	10	10	10	10	10	10	10	10



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE END MILLS

RECOMMENDED CUTTING CONDITIONS

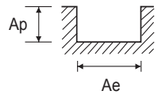
E5020, E5244, E5011 E5026, E5022, E5025 SERIES

TiAlN Coated

2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	13/16
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185
					IPT(fz)	.0003	.0005	.0007	.0009	.0010	.0014	.0018	.0021	.0025	.0028	.0034
					RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880
					IPM(FEED)	5	6	6	6	6	6	6	6	6	6	6
	3-4		1.0D	1.0D	SFM(Vc)	185	165	150	145	155	145	140	155	160	155	155
					IPT(fz)	.0003	.0005	.0007	.0008	.0010	.0014	.0017	.0021	.0023	.0026	.0034
					RPM	7440	5040	3720	3000	2400	1800	1440	1200	1080	960	740
					IPM(FEED)	4	5	5	5	5	5	5	5	5	5	5
	5		1.0D	1.0D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130
					IPT(fz)	.0002	.0005	.0006	.0008	.0010	.0013	.0017	.0019	.0022	.0032	.0040
					RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620
					IPM(FEED)	3	4	4	4	4	4	4	4	4	5	5
	6	Low alloy steel	1.0D	1.0D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185
					IPT(fz)	.0003	.0005	.0007	.0009	.0010	.0014	.0018	.0021	.0025	.0028	.0034
					RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880
					IPM(FEED)	5	6	6	6	6	6	6	6	6	6	6
	7		1.0D	1.0D	SFM(Vc)	185	165	150	145	155	145	140	155	160	155	155
					IPT(fz)	.0003	.0005	.0007	.0008	.0010	.0014	.0017	.0021	.0023	.0026	.0034
					RPM	7440	5040	3720	3000	2400	1800	1440	1200	1080	960	740
					IPM(FEED)	4	5	5	5	5	5	5	5	5	5	5
	8-9		1.0D	1.0D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130
					IPT(fz)	.0002	.0005	.0006	.0008	.0010	.0013	.0017	.0019	.0022	.0032	.0040
					RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620
					IPM(FEED)	3	4	4	4	4	4	4	4	4	5	5
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185
					IPT(fz)	.0003	.0005	.0007	.0009	.0010	.0014	.0018	.0021	.0025	.0028	.0034
					RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880
					IPM(FEED)	5	6	6	6	6	6	6	6	6	6	6
	11.1		1.0D	1.0D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130
					IPT(fz)	.0002	.0005	.0006	.0008	.0010	.0013	.0017	.0019	.0022	.0032	.0040
					RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620
					IPM(FEED)	3	4	4	4	4	4	4	4	4	5	5
M	12-13	Stainless steel	1.0D	1.0D	SFM(Vc)	295	270	255	245	265	255	235	265	245	255	255
					IPT(fz)	.0002	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0012	.0016	.0021
					RPM	12000	8280	6240	5040	4080	3120	2400	2040	1680	1560	1200
					IPM(FEED)	4	4	4	4	4	4	4	4	4	5	5
	14.1-14.2		1.0D	1.0D	SFM(Vc)	295	270	255	245	265	255	235	265	245	255	255
					IPT(fz)	.0002	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0012	.0016	.0021
					RPM	12000	8280	6240	5040	4080	3120	2400	2040	1680	1560	1200
					IPM(FEED)	4	4	4	4	4	4	4	4	4	5	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	SFM(Vc)	250	215	205	195	210	195	200	205	210	195	215
					IPT(fz)	.0004	.0007	.0009	.0011	.0017	.0025	.0029	.0042	.0045	.0058	.0075
					RPM	10200	6600	5040	3960	3240	2400	2040	1560	1440	1200	1000
					IPM(FEED)	9	9	9	9	11	12	12	13	13	14	15
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	1.0D	SFM(Vc)	590	550	490	490	540	510	495	535	530	510	510
					IPT(fz)	.0004	.0006	.0008	.0010	.0013	.0017	.0021	.0026	.0029	.0034	.0044
					RPM	24000	16800	12000	9960	8280	6240	5040	4080	3600	3120	2400
					IPM(FEED)	20	20	20	20	21	21	21	21	21	21	21
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	SFM(Vc)	440	395	395	365	410	395	365	410	390	395	400
					IPT(fz)	.0004	.0006	.0008	.0010	.0013	.0017	.0022	.0026	.0030	.0033	.0043
					RPM	18000	12000	9600	7440	6240	4800	3720	3120	2640	2400	1870
					IPM(FEED)	15	15	15	15	16	16	16	16	16	16	16



※ The Feed, in long & extra long types, should be reduced by around 50%.

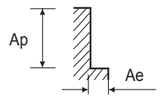
CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

E5021, E5245, E5012, E5065 E5023, E5024, E5216 SERIES

4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	13/16
P	1-2	Non-alloy steel	0.1D	1.5D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0020	.0025	.0031	.0034	.0043	.0055
					RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550
					IPM(FEED)	10	11	11	11	11	11	11	11	11	12	12
	3-4		0.1D	1.5D	SFM(Vc)	120	105	100	95	105	100	95	105	105	100	100
					IPT(fz)	.0004	.0008	.0010	.0013	.0016	.0021	.0026	.0031	.0036	.0042	.0052
					RPM	4800	3200	2400	1900	1600	1200	950	800	700	600	480
					IPM(FEED)	8	10	10	10	10	10	10	10	10	10	10
	5		0.1D	1.5D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0022	.0027	.0031	.0045	.0056
					RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400
					IPM(FEED)	6	7	7	7	7	7	7	7	7	9	9
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0020	.0025	.0031	.0034	.0043	.0055
					RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550
					IPM(FEED)	10	11	11	11	11	11	11	11	11	12	12
	7		0.1D	1.5D	SFM(Vc)	120	105	100	95	105	100	95	105	105	100	100
					IPT(fz)	.0004	.0008	.0010	.0013	.0016	.0021	.0026	.0031	.0036	.0042	.0052
					RPM	4800	3200	2400	1900	1600	1200	950	800	700	600	480
					IPM(FEED)	8	10	10	10	10	10	10	10	10	10	10
	8-9		0.1D	1.5D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0022	.0027	.0031	.0045	.0056
					RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400
					IPM(FEED)	6	7	7	7	7	7	7	7	7	9	9
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	135	120	115	110	120	115	110	120	120	115	115
					IPT(fz)	.0005	.0007	.0010	.0013	.0015	.0020	.0025	.0031	.0034	.0043	.0055
					RPM	5500	3700	2800	2200	1800	1400	1100	900	800	700	550
					IPM(FEED)	10	11	11	11	11	11	11	11	11	12	12
	11.1		0.1D	1.5D	SFM(Vc)	100	85	80	80	85	80	80	85	85	80	85
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0022	.0027	.0031	.0045	.0056
					RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400
					IPM(FEED)	6	7	7	7	7	7	7	7	7	9	9
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	195	175	165	155	170	165	155	170	160	165	170
					IPT(fz)	.0003	.0004	.0005	.0006	.0008	.0010	.0013	.0015	.0018	.0023	.0031
					RPM	8000	5300	4000	3200	2600	2000	1600	1300	1100	1000	800
					IPM(FEED)	8	8	8	8	8	8	8	8	8	9	10
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	160	135	130	125	135	130	130	130	135	130	135
					IPT(fz)	.0007	.0011	.0014	.0018	.0025	.0034	.0046	.0063	.0072	.0084	.0109
					RPM	6500	4200	3200	2500	2100	1600	1300	1000	900	800	640
					IPM(FEED)	18	18	18	18	21	22	24	25	26	27	28
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	395	360	325	315	345	325	315	340	340	325	340
					IPT(fz)	.0006	.0009	.0012	.0015	.0019	.0025	.0031	.0038	.0043	.0050	.0063
					RPM	16000	11000	8000	6400	5300	4000	3200	2600	2300	2000	1600
					IPM(FEED)	38	38	38	38	40	40	40	40	40	40	40
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM(Vc)	295	260	245	235	260	245	235	260	250	245	255
					IPT(fz)	.0005	.0008	.0010	.0013	.0019	.0026	.0032	.0039	.0046	.0052	.0065
					RPM	12000	8000	6000	4800	4000	3000	2400	2000	1700	1500	1200
					IPM(FEED)	25	25	25	25	31	31	31	31	31	31	31



CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

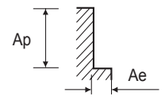
E5021, E5245, E5012, E5065 E5023, E5024, E5216 SERIES

TiAlN Coated

4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	13/16
P	1-2	Non-alloy steel	0.1D	1.5D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0020	.0025	.0030	.0035	.0042	.0051
					RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880
					IPM(FEED)	15	17	17	17	17	17	17	17	17	18	18
	3-4		0.1D	1.5D	SFM(Vc)	185	165	150	145	155	145	140	155	160	155	155
					IPT(fz)	.0004	.0007	.0010	.0013	.0016	.0021	.0026	.0031	.0035	.0042	.0054
					RPM	7440	5040	3720	3000	2400	1800	1440	1200	1080	960	740
					IPM(FEED)	13	15	15	15	15	15	15	15	15	16	16
	5		0.1D	1.5D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0023	.0027	.0031	.0045	.0056
					RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620
					IPM(FEED)	10	11	11	11	11	11	11	11	11	14	14
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0020	.0025	.0030	.0035	.0042	.0051
					RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880
					IPM(FEED)	15	17	17	17	17	17	17	17	17	18	18
	7		0.1D	1.5D	SFM(Vc)	185	165	150	145	155	145	140	155	160	155	155
					IPT(fz)	.0004	.0007	.0010	.0013	.0016	.0021	.0026	.0031	.0035	.0042	.0054
					RPM	7440	5040	3720	3000	2400	1800	1440	1200	1080	960	740
					IPM(FEED)	13	15	15	15	15	15	15	15	15	16	16
	8-9		0.1D	1.5D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0023	.0027	.0031	.0045	.0056
					RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620
					IPM(FEED)	10	11	11	11	11	11	11	11	11	14	14
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	210	190	180	170	190	175	165	190	175	175	185
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0020	.0025	.0030	.0035	.0042	.0051
					RPM	8640	5760	4370	3430	2880	2160	1680	1440	1200	1080	880
					IPM(FEED)	15	17	17	17	17	17	17	17	17	18	18
	11.1		0.1D	1.5D	SFM(Vc)	155	135	130	120	135	130	120	135	130	130	130
					IPT(fz)	.0004	.0007	.0009	.0011	.0013	.0018	.0023	.0027	.0031	.0045	.0056
					RPM	6240	4080	3120	2400	2040	1560	1200	1030	890	780	620
					IPM(FEED)	10	11	11	11	11	11	11	11	11	14	14
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	295	270	255	245	265	255	235	265	245	255	255
					IPT(fz)	.0003	.0004	.0005	.0006	.0007	.0010	.0013	.0015	.0018	.0022	.0031
					RPM	12000	8280	6240	5040	4080	3120	2400	2040	1680	1560	1200
					IPM(FEED)	12	12	12	12	12	12	12	12	12	14	15
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	250	215	205	195	210	195	200	205	210	195	215
					IPT(fz)	.0007	.0010	.0013	.0017	.0025	.0036	.0045	.0063	.0071	.0088	.0093
					RPM	10200	6600	5040	3960	3240	2400	2040	1560	1440	1200	1000
					IPM(FEED)	27	27	27	27	33	35	37	39	41	42	37
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	590	550	490	490	540	510	495	535	530	510	510
					IPT(fz)	.0006	.0008	.0012	.0014	.0018	.0024	.0030	.0037	.0042	.0049	.0064
					RPM	24000	16800	12000	9960	8280	6240	5040	4080	3600	3120	2400
					IPM(FEED)	57	57	57	57	61	61	61	61	61	61	61
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	SFM(Vc)	440	395	395	365	410	395	365	410	390	395	400
					IPT(fz)	.0006	.0009	.0011	.0015	.0019	.0024	.0032	.0038	.0045	.0049	.0063
					RPM	18000	12000	9600	7440	6240	4800	3720	3120	2640	2400	1870
					IPM(FEED)	44	44	44	44	47	47	47	47	47	47	47

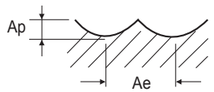


CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

E5249, E5014, E5018, E5251 SERIES — 2 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105
					IPT(fz)	.0004	.0006	.0008	.0010	.0012	.0016	.0020	.0017	.0020	.0023	.0026	.0030
					RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500
					IPM(FEED)	4	4	4	4	4	4	4	3	3	3	3	3
	5		0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0014	.0016	.0019	.0021	.0023
					RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430
					IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	2
	6-7	Low alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105
					IPT(fz)	.0004	.0006	.0008	.0010	.0012	.0016	.0020	.0017	.0020	.0023	.0026	.0030
					RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500
					IPM(FEED)	4	4	4	4	4	4	4	3	3	3	3	3
	8-9		0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0014	.0016	.0019	.0021	.0023
					RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430
					IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	2
	10	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105
					IPT(fz)	.0004	.0006	.0008	.0010	.0012	.0016	.0020	.0017	.0020	.0023	.0026	.0030
					RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500
					IPM(FEED)	4	4	4	4	4	4	4	3	3	3	3	3
	11.1		0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0014	.0016	.0019	.0021	.0023
					RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430
					IPM(FEED)	2	2	2	2	2	2	2	2	2	2	2	2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	180	160	145	140	155	145	140	155	145	150	145	155
					IPT(fz)	.0004	.0006	.0011	.0016	.0021	.0036	.0045	.0054	.0065	.0071	.0080	.0075
					RPM	7300	4900	3600	2900	2400	1800	1430	1200	1000	920	810	730
					IPM(FEED)	6	6	8	9	10	13	13	13	13	13	13	11
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	530	470	445	430	475	450	420	470	440	440	430	445
					IPT(fz)	.0003	.0004	.0005	.0007	.0009	.0014	.0017	.0024	.0028	.0028	.0031	.0036
					RPM	21500	14300	10900	8800	7260	5500	4300	3600	3000	2700	2400	2100
					IPM(FEED)	11	11	11	13	13	15	15	17	17	15	15	15



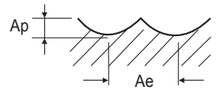
CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

E5249, E5014, E5018, E5251 SERIES — TiAlN Coated

2 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165
					IPT(fz)	.0004	.0006	.0007	.0009	.0011	.0016	.0019	.0019	.0021	.0025	.0028	.0032
					RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780
					IPM(FEED)	6	6	6	6	6	6	6	5	5	5	5	5
	5		0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0018	.0020	.0022
					RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3
	6-7	Low alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165
					IPT(fz)	.0004	.0006	.0007	.0009	.0011	.0016	.0019	.0019	.0021	.0025	.0028	.0032
					RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780
					IPM(FEED)	6	6	6	6	6	6	6	5	5	5	5	5
	8-9		0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0018	.0020	.0022
					RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3
	10	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165
					IPT(fz)	.0004	.0006	.0007	.0009	.0011	.0016	.0019	.0019	.0021	.0025	.0028	.0032
					RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780
					IPM(FEED)	6	6	6	6	6	6	6	5	5	5	5	5
	11.1		0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145
					IPT(fz)	.0002	.0003	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0018	.0020	.0022
					RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	280	250	230	225	245	225	165	250	230	235	215	240
					IPT(fz)	.0004	.0007	.0011	.0015	.0022	.0036	.0060	.0052	.0064	.0069	.0083	.0079
					RPM	11400	7680	5640	4560	3720	2760	1680	1920	1560	1440	1200	1140
					IPM(FEED)	9	10	12	14	16	20	20	20	20	20	20	18
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	825	730	685	650	740	705	660	740	690	685	670	690
					IPT(fz)	.0003	.0004	.0005	.0008	.0009	.0013	.0017	.0024	.0029	.0027	.0031	.0035
					RPM	33600	22320	16800	13200	11280	8640	6720	5640	4680	4200	3720	3240
					IPM(FEED)	17	17	17	20	20	23	23	27	27	23	23	23

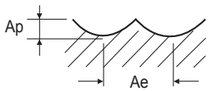


CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

E5250, E5060, E5062, E5252 SERIES — 4 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105
					IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0012	.0015	.0014	.0017	.0019	.0022	.0025
					RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500
					IPM(FEED)	6	6	6	6	6	6	6	5	5	5	5	5
	5		0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90
					IPT(fz)	.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0010	.0012	.0014	.0016	.0017
					RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3
	6-7	Low alloy steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105
					IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0012	.0015	.0014	.0017	.0019	.0022	.0025
					RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500
					IPM(FEED)	6	6	6	6	6	6	6	5	5	5	5	5
	8-9		0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90
					IPT(fz)	.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0010	.0012	.0014	.0016	.0017
					RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3
	10	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	130	115	105	105	110	105	100	115	110	105	105	105
					IPT(fz)	.0003	.0004	.0006	.0007	.0009	.0012	.0015	.0014	.0017	.0019	.0022	.0025
					RPM	5200	3500	2600	2100	1700	1270	1000	870	750	650	580	500
					IPM(FEED)	6	6	6	6	6	6	6	5	5	5	5	5
	11.1		0.7D	0.3D	SFM(Vc)	110	95	85	85	95	90	85	95	90	90	85	90
					IPT(fz)	.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0010	.0012	.0014	.0016	.0017
					RPM	4400	2900	2100	1700	1430	1100	870	730	620	540	480	430
					IPM(FEED)	3	3	3	3	3	3	3	3	3	3	3	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	180	160	145	140	155	145	140	155	145	150	145	155
					IPT(fz)	.0003	.0005	.0008	.0012	.0016	.0026	.0033	.0040	.0048	.0052	.0059	.0058
					RPM	7300	4900	3600	2900	2400	1800	1430	1200	1000	920	810	730
					IPM(FEED)	9	10	12	14	15	19	19	19	19	19	19	17
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	530	470	445	430	475	450	420	470	440	440	430	445
					IPT(fz)	.0002	.0003	.0004	.0006	.0007	.0010	.0013	.0018	.0022	.0020	.0023	.0026
					RPM	21500	14300	10900	8800	7260	5500	4300	3600	3000	2700	2400	2100
					IPM(FEED)	17	17	17	20	20	22	22	26	26	22	22	22



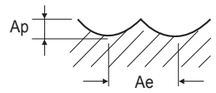
CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

E5250, E5060, E5062, E5252 SERIES — TiAlN Coated

4 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16
P	1-4	Non-alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165
					IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0014	.0015	.0017	.0020	.0022	.0026
					RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780
					IPM(FEED)	9	9	9	10	9	9	9	8	8	8	8	8
	5		0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145
					IPT(fz)	.0001	.0002	.0003	.0004	.0004	.0006	.0008	.0009	.0010	.0012	.0014	.0015
					RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670
					IPM(FEED)	4	4	4	4	4	4	4	4	4	4	4	4
	6-7	Low alloy steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165
					IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0014	.0015	.0017	.0020	.0022	.0026
					RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780
					IPM(FEED)	9	9	9	10	9	9	9	8	8	8	8	8
	8-9		0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145
					IPT(fz)	.0001	.0002	.0003	.0004	.0004	.0006	.0008	.0009	.0010	.0012	.0014	.0015
					RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670
					IPM(FEED)	4	4	4	4	4	4	4	4	4	4	4	4
	10	High alloyed steel, and tool steel	0.7D	0.3D	SFM(Vc)	200	175	165	160	175	155	155	175	175	165	160	165
					IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0014	.0015	.0017	.0020	.0022	.0026
					RPM	8110	5400	4080	3240	2640	1920	1560	1320	1180	1020	900	780
					IPM(FEED)	9	9	9	10	9	9	9	8	8	8	8	8
	11.1		0.7D	0.3D	SFM(Vc)	170	150	135	130	150	135	130	150	140	135	135	145
					IPT(fz)	.0001	.0002	.0003	.0004	.0004	.0006	.0008	.0009	.0010	.0012	.0014	.0015
					RPM	6840	4560	3240	2640	2270	1680	1320	1140	960	840	740	670
					IPM(FEED)	4	4	4	4	4	4	4	4	4	4	4	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.7D	0.3D	SFM(Vc)	280	250	230	225	245	225	225	250	230	235	215	240
					IPT(fz)	.0003	.0005	.0008	.0012	.0015	.0026	.0032	.0038	.0048	.0052	.0063	.0059
					RPM	11400	7680	5640	4560	3720	2760	2270	1920	1560	1440	1200	1140
					IPM(FEED)	14	15	18	21	23	29	29	29	30	30	30	27
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	825	730	685	650	740	705	660	740	690	685	670	690
					IPT(fz)	.0002	.0003	.0004	.0006	.0007	.0010	.0013	.0018	.0022	.0021	.0024	.0027
					RPM	33600	22320	16800	13200	11280	8640	6720	5640	4680	4200	3720	3240
					IPM(FEED)	26	26	26	31	31	35	35	41	41	35	35	35

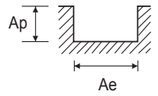


CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

EH527 SERIES — TiAlN Coated 2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-2	Non-alloy steel	1.0D	1.0D	SFM(Vc)	160	160	160	160	155	160	160	155	160	160	160
					IPT(fz)	.0003	.0005	.0006	.0008	.0010	.0013	.0016	.0020	.0022	.0031	.0039
					RPM	7700	5180	3920	3080	2520	1960	1540	1260	1120	980	770
					IPM(FEED)	4	5	5	5	5	5	5	5	5	6	6
	3-4		1.0D	1.0D	SFM(Vc)	140	140	140	135	140	140	135	140	140	140	140
					IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0015	.0018	.0020	.0030	.0037
					RPM	6720	4480	3360	2660	2240	1680	1330	1120	980	840	672
					IPM(FEED)	4	4	4	4	4	4	4	4	4	5	5
	5		1.0D	1.0D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0003	.0004	.0005	.0007	.0008	.0011	.0013	.0016	.0019	.0029	.0036
					RPM	5600	3640	2800	2240	1820	1400	1120	924	798	700	560
					IPM(FEED)	3	3	3	3	3	3	3	3	3	4	4
	6	Low alloy steel	1.0D	1.0D	SFM(Vc)	160	160	160	160	155	160	160	155	160	160	160
					IPT(fz)	.0003	.0005	.0006	.0008	.0010	.0013	.0016	.0020	.0022	.0031	.0039
					RPM	7700	5180	3920	3080	2520	1960	1540	1260	1120	980	770
					IPM(FEED)	4	5	5	5	5	5	5	5	5	6	6
	7		1.0D	1.0D	SFM(Vc)	140	140	140	135	140	140	135	140	140	140	140
					IPT(fz)	.0003	.0004	.0006	.0008	.0009	.0012	.0015	.0018	.0020	.0030	.0037
					RPM	6720	4480	3360	2660	2240	1680	1330	1120	980	840	672
					IPM(FEED)	4	4	4	4	4	4	4	4	4	5	5
	8-9		1.0D	1.0D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0003	.0004	.0005	.0007	.0008	.0011	.0013	.0016	.0019	.0029	.0036
					RPM	5600	3640	2800	2240	1820	1400	1120	924	798	700	560
					IPM(FEED)	3	3	3	3	3	3	3	3	3	4	4
	10	High alloyed steel, and tool steel	1.0D	1.0D	SFM(Vc)	160	160	160	160	155	160	160	155	160	160	160
					IPT(fz)	.0003	.0005	.0006	.0008	.0010	.0013	.0016	.0020	.0022	.0031	.0039
					RPM	7700	5180	3920	3080	2520	1960	1540	1260	1120	980	770
					IPM(FEED)	4	5	5	5	5	5	5	5	5	6	6
	11.1		1.0D	1.0D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0003	.0004	.0005	.0007	.0008	.0011	.0013	.0016	.0019	.0029	.0036
					RPM	5600	3640	2800	2240	1820	1400	1120	924	798	700	560
					IPM(FEED)	3	3	3	3	3	3	3	3	3	4	4
M	12-14.2	Stainless steel	1.0D	1.0D	SFM(Vc)	230	230	230	230	225	230	230	225	220	230	230
					IPT(fz)	.0002	.0003	.0004	.0004	.0005	.0007	.0009	.0011	.0013	.0014	.0018
					RPM	11200	7420	5600	4480	3640	2800	2240	1820	1540	1400	1120
					IPM(FEED)	4	4	4	4	4	4	4	4	4	4	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	1.0D	SFM(Vc)	190	180	185	180	180	185	190	175	180	185	185
					IPT(fz)	.0004	.0007	.0009	.0011	.0017	.0022	.0030	.0043	.0048	.0054	.0072
					RPM	9100	5880	4480	3500	2940	2240	1820	1400	1260	1120	900
					IPM(FEED)	8	8	8	8	10	10	11	12	12	12	13
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	1.0D	1.0D	SFM(Vc)	460	475	460	460	460	460	460	450	465	460	460
					IPT(fz)	.0004	.0006	.0008	.0010	.0013	.0017	.0021	.0026	.0030	.0034	.0042
					RPM	22400	15400	11200	8960	7420	5600	4480	3640	3220	2800	2240
					IPM(FEED)	18	18	18	18	19	19	19	19	19	19	19
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	SFM(Vc)	345	345	345	345	345	345	345	345	345	345	345
					IPT(fz)	.0004	.0006	.0008	.0010	.0013	.0017	.0021	.0025	.0029	.0033	.0042
					RPM	16800	11200	8400	6720	5600	4200	3360	2800	2380	2100	1680
					IPM(FEED)	13	13	13	13	14	14	14	14	14	14	14

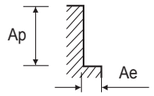


CARBIDE END MILLS — RECOMMENDED CUTTING CONDITIONS

EH540 SERIES — TiAlN Coated 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0
P	1-2	Non-alloy steel	0.1D	1.5D	SFM(Vc)	160	160	160	160	155	160	160	155	160	160	160
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0019	.0024	.0030	.0033	.0043	.0055
					RPM	7700	5180	3920	3080	2520	1960	1540	1260	1120	980	770
					IPM(FEED)	13	15	15	15	15	15	15	15	15	17	17
	3-4		0.1D	1.5D	SFM(Vc)	140	140	140	135	140	140	135	140	140	140	140
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0019	.0024	.0029	.0033	.0042	.0052
					RPM	6720	4480	3360	2660	2240	1680	1330	1120	980	840	670
					IPM(FEED)	12	13	13	13	13	13	13	13	13	14	14
	5		0.1D	1.5D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0004	.0007	.0009	.0011	.0014	.0018	.0022	.0027	.0031	.0043	.0054
					RPM	5600	3640	2800	2240	1820	1400	1120	920	800	700	560
					IPM(FEED)	9	10	10	10	10	10	10	10	10	12	12
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	160	160	160	160	155	160	160	155	160	160	160
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0019	.0024	.0030	.0033	.0043	.0055
					RPM	7700	5180	3920	3080	2520	1960	1540	1260	1120	980	770
					IPM(FEED)	13	15	15	15	15	15	15	15	15	17	17
	7		0.1D	1.5D	SFM(Vc)	140	140	140	135	140	140	135	140	140	140	140
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0019	.0024	.0029	.0033	.0042	.0052
					RPM	6720	4480	3360	2660	2240	1680	1330	1120	980	840	670
					IPM(FEED)	12	13	13	13	13	13	13	13	13	14	14
	8-9		0.1D	1.5D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0004	.0007	.0009	.0011	.0014	.0018	.0022	.0027	.0031	.0043	.0054
					RPM	5600	3640	2800	2240	1820	1400	1120	920	800	700	560
					IPM(FEED)	9	10	10	10	10	10	10	10	10	12	12
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	160	160	160	160	155	160	160	155	160	160	160
					IPT(fz)	.0004	.0007	.0010	.0012	.0015	.0019	.0024	.0030	.0033	.0043	.0055
					RPM	7700	5180	3920	3080	2520	1960	1540	1260	1120	980	770
					IPM(FEED)	13	15	15	15	15	15	15	15	15	17	17
	11.1		0.1D	1.5D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0004	.0007	.0009	.0011	.0014	.0018	.0022	.0027	.0031	.0043	.0054
					RPM	5600	3640	2800	2240	1820	1400	1120	920	800	700	560
					IPM(FEED)	9	10	10	10	10	10	10	10	10	12	12
M	12-14.2	Stainless steel	0.1D	1.5D	SFM(Vc)	230	230	230	230	225	230	230	225	220	230	230
					IPT(fz)	.0002	.0004	.0005	.0006	.0008	.0010	.0012	.0015	.0018	.0021	.0029
					RPM	11200	7420	5600	4480	3640	2800	2240	1820	1540	1400	1120
					IPM(FEED)	11	11	11	11	11	11	11	11	11	12	13
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	190	180	185	180	180	185	190	175	180	185	185
					IPT(fz)	.0007	.0011	.0014	.0018	.0026	.0036	.0045	.0063	.0071	.0083	.0111
					RPM	9100	5880	4480	3500	2940	2240	1820	1400	1260	1120	900
					IPM(FEED)	25	25	25	25	30	32	33	35	36	37	40
N	21-25	Aluminum-wrought alloy Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	460	475	460	460	460	460	460	450	465	460	460
					IPT(fz)	.0006	.0009	.0012	.0015	.0019	.0025	.0031	.0038	.0043	.0050	.0063
					RPM	22400	15400	11200	8960	7420	5600	4480	3640	3220	2800	2240
					IPM(FEED)	53	53	53	53	56	56	56	56	56	56	56
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.0D	SFM(Vc)	345	345	345	345	345	345	345	345	345	345	345
					IPT(fz)	.0006	.0009	.0012	.0015	.0019	.0026	.0032	.0038	.0045	.0051	.0064
					RPM	16800	11200	8400	6720	5600	4200	3360	2800	2380	2100	1680
					IPM(FEED)	40	40	40	40	43	43	43	43	43	43	43



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

CARBIDE END MILLS

RECOMMENDED CUTTING CONDITIONS

PROPERTIES AND APPLICATIONS OF COATINGS

	Titanium Nitride	Titanium Carbonitride	Super TiAlN "F" Coatings	Super TiAlN "E" Coatings
Hardness	HRc82	HRc92	HRc92	HRc95
Coefficient of Friction Against Dry Steel (.8)	.4	.4	.4	.4
Coating Thickness 3 Microns = .0001	1- 4	1- 4	1- 5	1- 3
Maximum Working Temperature	1100 F	750F	1470 F	1470 F
Coating Color	Gold	Blue - Gray	Violet - Gray	Violet - Gray
Key Characteristics	Good General Purpose	Good Wear Resistance Good Toughness Moderate Heat Resistance	Enhanced Toughness High Heat Resistance	High Hardness Enhanced Toughness High Heat Resistance
Primary Applications	Machining of Iron Based Materials	General Machining of Various Materials	Steel, Cast Iron, Stainless, Nickel Based Alloys, High Temp and Titanium Alloys, High Speed Machining Wet, Dry, or Semi Dry Condition	Hardened Workpieces, Steel, Cast Iron, Stainless, Nickel Based Alloys, High Temp and Titanium Alloys, Machining Wet, Dry, or Semi Dry Condition
YG:TYLON SUPER TiAlN COATED TOOLS CAN BE RUN 20% - 50% FASTER THAN TiN or TiCN ON MOST MATERIALS				

YG

Leading Through Innovation

HSS PM60

ONLY ONE COATED PM60 END MILLS

- Perfect Solution of Carbide Chipping under Vibrations

SELECTION GUIDE

YG MILLING TOOLS

HSS PM60

ONLY ONE END MILLS

Perfect Solution of Carbide Chipping under Vibrations

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C803

SERIES	GYG64	GYG67	GYG65	GYG66	GYG69	GYG68	GYG70
FLUTE	2	4	4	4	4&5	3~6	3~6
HELIX ANGLE	30°	30°	30°	M-Helix	M-Helix	30°	30°
CUTTING EDGE SHAPE	SQUARE	BALL NOSE	SQUARE	SQUARE	CORNER RADIUS ROUGHING	ROUGHING	ROUGHING
SIZE MIN	D1/8	R1/16	D1/8	D1/8	D1/4	D1/4	D1/4
SIZE MAX	D1	R1/2	D1	D1	D1	D1-1/4	D1-1/4
PAGE	C796	C797	C798	C799	C780	C781	C782
	CENTER CUT	-	CENTER CUT	CENTER CUT	FINE CENTER CUT	FINE CENTER CUT	COARSE CENTER CUT
	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating

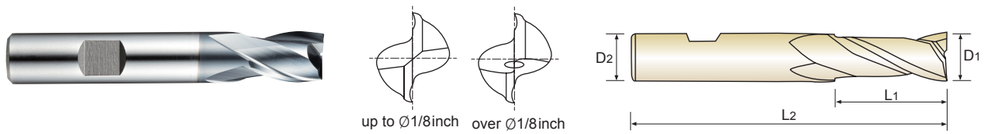
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc							
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎	◎	◎	◎	1
	2		About 0.45% C	Annealed	190	13	◎	◎	◎	◎	◎	◎	2
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎	◎	◎	◎	3
	4		About 0.75% C	Annealed	270	28	◎	◎	◎	◎	◎	◎	4
	5		About 0.75% C	Quenched & Tempered	300	32	○	○	○	○	○	○	5
	6	Low alloy steel		Annealed	180	10	◎	◎	◎	◎	◎	◎	6
	7			Quenched & Tempered	275	29	◎	◎	◎	◎	◎	◎	7
	8			Quenched & Tempered	300	32	○	○	○	○	○	○	8
	9			Quenched & Tempered	350	38	○	○	○	○	○	○	9
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎	◎	◎	◎	10
	11			Quenched & Tempered	325	35	○	○	○	○	○	○	11
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	◎	◎	◎	◎	◎	12
	13		Martensitic	Quenched & Tempered	240	23	◎	◎	◎	◎	◎	◎	13
	14		Austenitic		180	10	◎	◎	◎	◎	◎	◎	14
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎	◎	◎	◎	15
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎	◎	◎	◎	16
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎	◎	◎	◎	17
	18		Pearlitic		250	25	◎	◎	◎	◎	◎	◎	18
	19	Malleable cast iron	Ferritic		130		◎	◎	◎	◎	◎	◎	19
	20		Pearlitic		230	21	◎	◎	◎	◎	◎	◎	20
N	21	Aluminum-wrought alloy	Not Curable		60								21
	22		Curable	Hardened	100								22
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75								23
	24		≤ 12% Si, Curable	Hardened	90								24
	25		> 12% Si, Not Curable		130								25
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○	○	○		26
	27		CuZn, CuSnZn (Brass)		90		○	○	○	○	○		27
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○	○		28
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic										29
	30		Rubber, Wood, etc.										30
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15							31
	32			Cured	280	30							32
	33		Ni or Co Based	Annealed	250	25							33
	34			Cured	350	38							34
	35			Cast	320	34							35
	36	Titanium Alloys	Pure Titanium		400 Rm								36
	37		Alpha + Beta Alloys	Hardened	1050 Rm								37
H	38	Hardened steel		Hardened	550	55							38
	39			Hardened	630	60							39
	40	Chilled Cast Iron		Cast	400	42	○	○	○	○	○		40
	41	Hardened Cast Iron		Hardened	550	55							41

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG ONLY ONE END MILLS

FLAT SHANK **GYG64** SERIES

PM60, 2 FLUTE (Center Cut)



PM60 | 2 | 30° | FLAT | Y Coating | p.C803

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-Coating	D_1	D_2	L_1	L_2
GYG64008	**1/8**	3/8	3/8	2-5/16
GYG64012	**3/16**	3/8	7/16	2-5/16
GYG64016	**1/4**	3/8	1/2	2-5/16
GYG64020	**5/16**	3/8	9/16	2-5/16
GYG64024	**3/8**	3/8	9/16	2-5/16
GYG64032	**1/2**	1/2	1	3
GYG64040	**5/8**	5/8	1-5/16	3-7/16
GYG64048	**3/4**	3/4	1-5/16	3-7/16
GYG64064	**1**	1	1-5/8	4-1/8

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

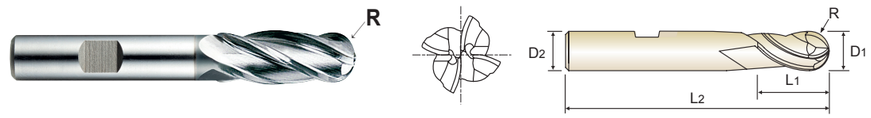
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	◎	○												○	

YG ONLY ONE END MILLS

FLAT SHANK **GYG67** SERIES

PM60, 4 FLUTE BALL NOSE



PM60 | 4 | 30° | R ±.001 | FLAT | Y Coating | p.C804

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-Coating	R	D_1	D_2	L_1	L_2
GYG67008	R1/16	**1/8**	3/8	3/8	2-5/16
GYG67012	R3/32	**3/16**	3/8	1/2	2-3/8
GYG67016	R1/8	**1/4**	3/8	5/8	2-7/16
GYG67020	R5/32	**5/16**	3/8	3/4	2-1/2
GYG67024	R3/16	**3/8**	3/8	3/4	2-1/2
GYG67032	R1/4	**1/2**	1/2	1-1/4	3-1/4
GYG67040	R5/16	**5/8**	5/8	1-5/8	3-3/4
GYG67048	R3/8	**3/4**	3/4	1-5/8	3-7/8
GYG67064	R1/2	**1**	1	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	◎	○												○	

YG ONLY ONE END MILLS

FLAT SHANK **GYG65** SERIES

PM60, 4 FLUTE (Center Cut)

PM60 | 4 | 30° | FLAT | Y Coating | p.C805

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-Coating	D1	D2	L1	L2
GYG65008	1/8	3/8	3/8	2-5/16
GYG65012	3/16	3/8	1/2	2-3/8
GYG65016	1/4	3/8	5/8	2-7/16
GYG65020	5/16	3/8	3/4	2-1/2
GYG65024	3/8	3/8	3/4	2-1/2
GYG65032	1/2	1/2	1-1/4	3-1/4
GYG65040	5/8	5/8	1-5/8	3-3/4
GYG65048	3/4	3/4	1-5/8	3-7/8
GYG65056	7/8	7/8	1-7/8	4-1/8
GYG65064	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

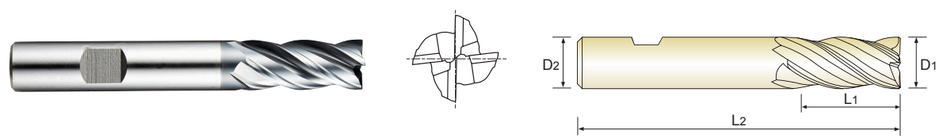
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												○	

YG ONLY ONE END MILLS

FLAT SHANK **GYG66** SERIES

PM60, 4 FLUTE MULTIPLE HELIX (Center Cut)



PM60 | 4 | 35°/37° | FLAT | Y Coating | p.C806

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Y-Coating	D1	D2	L1	L2
GYG66008	1/8	3/8	3/8	2-5/16
GYG66012	3/16	3/8	1/2	2-3/8
GYG66016	1/4	3/8	5/8	2-7/16
GYG66020	5/16	3/8	3/4	2-1/2
GYG66024	3/8	3/8	3/4	2-1/2
GYG66032	1/2	1/2	1-1/4	3-1/4
GYG66040	5/8	5/8	1-5/8	3-3/4
GYG66048	3/4	3/4	1-5/8	3-7/8
GYG66064	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	Shank Dia. Tolerance
0~-.0012	h6

◎ : Excellent ○ : Good

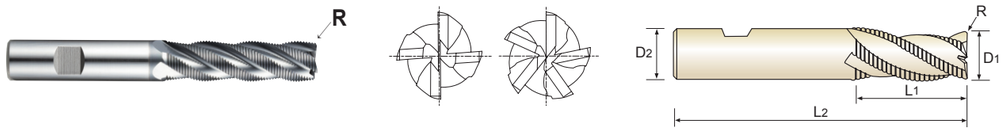
ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												○	

ONLY ONE END MILLS

FLAT SHANK **GYG69** SERIES

PM60, MULTI FLUTE MULTIPLE HELIX CORNER RADIUS ROUGHING - FINE (Center Cut)



PM60 | 4-5 | 44°/45° | FINE | FLAT | Y Coating

p.C807

5 Flute, 44°/44.5°/45°

Unit : Inch

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
Y-Coating	R	D1	D2	L1	L2	
GYG69016	R.020	**1/4**	3/8	5/8	2-7/16	4
GYG69020	R.020	**5/16**	3/8	3/4	2-1/2	4
GYG69024	R.020	**3/8**	3/8	3/4	2-1/2	4
GYG69032	R.020	**1/2**	1/2	1-1/4	3-1/4	4
GYG69040	R.040	**5/8**	5/8	1-1/4	3-3/8	5
GYG69048	R.040	**3/4**	3/4	1-5/8	3-7/8	5
GYG69064	R.040	**1**	1	2	4-1/2	5

Mill Dia. Tolerance (inch)
0 ~ +.0030

◎ : Excellent ○ : Good

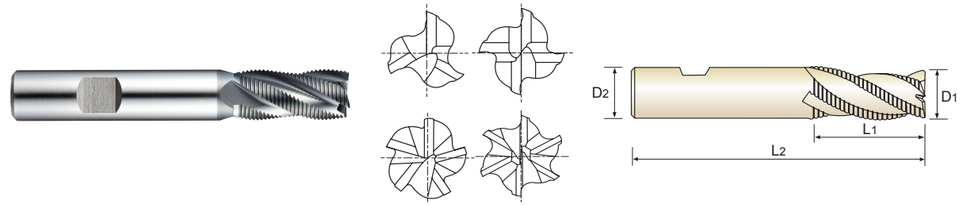
ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												○	

ONLY ONE END MILLS

FLAT SHANK **GYG68** SERIES

PM60, MULTI FLUTE ROUGHING- FINE (Center Cut)



PM60 | 3-6 | 30° | FINE | FLAT | Y Coating

p.C808

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
Y-Coating	D1	D2	L1	L2	
GYG68016	**1/4**	3/8	5/8	2-7/16	3
GYG68020	**5/16**	3/8	3/4	2-1/2	3
GYG68901	**5/16**	3/8	1-3/8	3_3/16	3
GYG68024	**3/8**	3/8	3/4	2-1/2	4
GYG68902	**3/8**	3/8	1-1/2	3-1/4	4
GYG68032	**1/2**	1/2	1-1/4	3-1/4	4
GYG68903	**1/2**	1/2	2	4	4
GYG68040	**5/8**	5/8	1-5/8	3-3/4	4
GYG68904	**5/8**	5/8	2-1/2	4-5/8	4
GYG68048	**3/4**	3/4	1-5/8	3-7/8	4
GYG68905	**3/4**	3/4	2-1/2	4-3/4	4
GYG68906	**3/4**	3/4	3	5-1/4	4
GYG68064	**1**	1	2	4-1/2	5
GYG68907	**1**	1	4	6-1/2	5
GYG68116	**1-1/4**	1-1/4	2	4-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

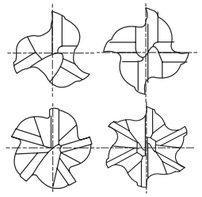
ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

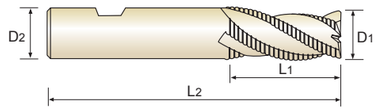
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												○	

ONLY ONE END MILLS

FLAT SHANK **GYG70 SERIES**

PM60, MULTI FLUTE ROUGHING- COARSE (Center Cut)





PM 60 | 3-6 | 30° | COARSE | FLAT | Y Coating | p.C808

Unit : Inch

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
Y-Coating	D_1	D_2	L_1	L_2	
GYG70016	**1/4**	3/8	5/8	2-7/16	3
GYG70020	**5/16**	3/8	3/4	2-1/2	3
GYG70024	**3/8**	3/8	3/4	2-1/2	4
GYG70032	**1/2**	1/2	1-1/4	3-1/4	4
GYG70040	**5/8**	5/8	1-5/8	3-3/4	4
GYG70048	**3/4**	3/4	1-5/8	3-7/8	4
GYG70064	**1**	1	2	4-1/2	5
GYG70116	**1-1/4**	1-1/4	2	4-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎

ISO	N										S					H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○												○	

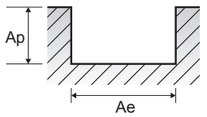
ONLY ONE END MILLS

RECOMMENDED CUTTING CONDITIONS

GYG64 SERIES 2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	185	245	260	255	260	265	265	235	235
					IPT(fz)	.0006	.0013	.0015	.0021	.0028	.0030	.0039	.0046	.0041
					RPM	5710	4950	3960	3130	2640	2030	1620	1200	890
					IPM(FEED)	7	13	12	13	15	12	13	11	7
	2		1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195
					IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044
					RPM	4610	4080	3310	2650	2270	1650	1380	990	750
					IPM(FEED)	6	10	9	11	13	11	9	8	7
	3-4		1.0D	0.5D	SFM(Vc)	125	160	170	180	180	170	175	175	150
					IPT(fz)	.0007	.0014	.0017	.0022	.0031	.0036	.0039	.0042	.0047
					RPM	3810	3280	2610	2170	1840	1300	1080	890	580
					IPM(FEED)	5	9	9	10	11	9	9	7	5
	5		1.0D	0.5D	SFM(Vc)	85	105	110	115	110	110	110	110	115
					IPT(fz)	.0007	.0011	.0015	.0020	.0027	.0031	.0036	.0041	.0041
					RPM	2610	2140	1650	1400	1140	850	680	550	430
					IPM(FEED)	3	5	5	6	6	5	5	5	4
	6	Low alloy steel	1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195
					IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044
					RPM	4610	4080	3310	2650	2270	1650	1380	990	750
					IPM(FEED)	6	10	9	11	13	11	9	8	7
	7		1.0D	0.5D	SFM(Vc)	125	160	170	180	180	170	175	175	150
					IPT(fz)	.0007	.0014	.0017	.0022	.0031	.0036	.0039	.0042	.0047
					RPM	3810	3280	2610	2170	1840	1300	1080	890	580
					IPM(FEED)	5	9	9	10	11	9	9	7	5
	8		1.0D	0.5D	SFM(Vc)	85	105	110	115	110	110	110	110	115
					IPT(fz)	.0007	.0011	.0015	.0020	.0027	.0031	.0036	.0041	.0041
					RPM	2610	2140	1650	1400	1140	850	680	550	430
					IPM(FEED)	3	5	5	6	6	5	5	5	4
	9		1.0D	0.5D	SFM(Vc)	65	80	85	90	85	85	90	90	80
					IPT(fz)	.0007	.0011	.0014	.0019	.0028	.0028	.0036	.0039	.0040
					RPM	2010	1670	1300	1080	870	650	540	450	300
					IPM(FEED)	3	4	4	4	5	4	4	4	2
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195
					IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044
					RPM	4610	4080	3310	2650	2270	1650	1380	990	750
					IPM(FEED)	6	10	9	11	13	11	9	8	7
	11.1		1.0D	0.5D	SFM(Vc)	85	105	110	115	110	110	110	110	115
					IPT(fz)	.0007	.0011	.0015	.0020	.0027	.0031	.0036	.0041	.0041
					RPM	2610	2140	1650	1400	1140	850	680	550	430
					IPM(FEED)	3	5	5	6	6	5	5	5	4
	11.2		1.0D	0.3D	SFM(Vc)	45	60	60	60	60	60	60	65	50
					IPT(fz)	.0007	.0011	.0014	.0019	.0029	.0028	.0035	.0039	.0038
					RPM	1400	1200	900	760	630	450	380	320	200
					IPM(FEED)	2	3	3	3	4	3	3	3	2
M	14.1	Stainless steel	1.0D	0.5D	SFM(Vc)	70	90	95	100	95	95	95	100	85
					IPT(fz)	.0007	.0011	.0014	.0019	.0028	.0028	.0036	.0040	.0038
					RPM	2210	1870	1450	1200	970	730	580	500	330
					IPM(FEED)	3	4	4	4	5	4	4	4	3
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	SFM(Vc)	150	200	215	215	225	215	225	195	195
					IPT(fz)	.0006	.0012	.0014	.0022	.0029	.0033	.0034	.0042	.0044
					RPM	4610	4080	3310	2650	2270	1650	1380	990	750
					IPM(FEED)	6	10	9	11	13	11	9	8	7
H	40	Hardened Cast Iron	1.0D	0.3D	SFM(Vc)	45	60	60	60	60	60	60	65	50
					IPT(fz)	.0007	.0011	.0014	.0019	.0029	.0028	.0035	.0039	.0038
					RPM	1400	1200	900	760	630	450	380	320	200
					IPM(FEED)	2	3	3	3	4	3	3	3	2

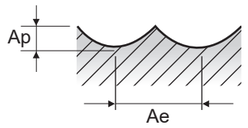


ONLY ONE END MILLS — RECOMMENDED CUTTING CONDITIONS

GYG67 SERIES — 4 FLUTE BALL NOSE - PLANE

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.5D	0.2D	SFM(Vc)	270	310	330	330	340	340	340	335	295
					IPT(fz)	.0007	.0012	.0016	.0023	.0032	.0034	.0042	.0046	.0048
					RPM	8320	6270	5010	4050	3480	2610	2070	1700	1130
					IPM(FEED)	24	29	32	38	45	36	34	31	22
	2		0.5D	0.2D	SFM(Vc)	215	245	260	255	260	265	255	245	230
					IPT(fz)	.0006	.0010	.0014	.0020	.0028	.0029	.0037	.0041	.0041
					RPM	6620	4950	3960	3130	2640	2030	1560	1250	880
					IPM(FEED)	16	20	22	25	30	23	23	21	15
	3-4		0.5D	0.2D	SFM(Vc)	145	160	170	180	175	175	175	170	145
					IPT(fz)	.0005	.0008	.0011	.0016	.0024	.0025	.0030	.0032	.0037
					RPM	4410	3260	2610	2170	1770	1350	1080	870	550
					IPM(FEED)	8	11	12	14	17	13	13	11	8
	5		0.5D	0.2D	SFM(Vc)	75	85	90	90	85	85	90	90	80
					IPT(fz)	.0004	.0007	.0010	.0014	.0022	.0021	.0027	.0030	.0030
					RPM	2310	1690	1350	1080	870	650	540	450	300
					IPM(FEED)	4	5	6	6	8	6	6	5	4
	6	Low alloy steel	0.5D	0.2D	SFM(Vc)	215	245	260	255	260	265	255	245	230
					IPT(fz)	.0006	.0010	.0014	.0020	.0028	.0029	.0037	.0041	.0041
					RPM	6620	4950	3960	3130	2640	2030	1560	1250	880
					IPM(FEED)	16	20	22	25	30	23	23	21	15
	7		0.5D	0.2D	SFM(Vc)	145	160	170	180	175	175	175	170	145
					IPT(fz)	.0005	.0008	.0011	.0016	.0024	.0025	.0030	.0032	.0037
					RPM	4410	3260	2610	2170	1770	1350	1080	870	550
					IPM(FEED)	8	11	12	14	17	13	13	11	8
	8		0.5D	0.2D	SFM(Vc)	75	85	90	90	85	85	90	90	80
					IPT(fz)	.0004	.0007	.0010	.0014	.0022	.0021	.0027	.0030	.0030
					RPM	2310	1690	1350	1080	870	650	540	450	300
					IPM(FEED)	4	5	6	6	8	6	6	5	4
	9		0.5D	0.2D	SFM(Vc)	75	85	90	90	85	85	90	90	80
					IPT(fz)	.0004	.0007	.0010	.0014	.0022	.0021	.0027	.0030	.0030
					RPM	2310	1690	1350	1080	870	650	540	450	300
					IPM(FEED)	4	5	6	6	8	6	6	5	4
	10	High alloyed steel, and tool steel	0.5D	0.2D	SFM(Vc)	215	245	260	255	260	265	255	245	230
					IPT(fz)	.0006	.0010	.0014	.0020	.0028	.0029	.0037	.0041	.0041
					RPM	6620	4950	3960	3130	2640	2030	1560	1250	880
					IPM(FEED)	16	20	22	25	30	23	23	21	15
	11.1		0.5D	0.2D	SFM(Vc)	75	85	90	90	85	85	90	90	80
					IPT(fz)	.0004	.0007	.0010	.0014	.0022	.0021	.0027	.0030	.0030
					RPM	2310	1690	1350	1080	870	650	540	450	300
					IPM(FEED)	4	5	6	6	8	6	6	5	4
	11.2		0.3D	0.2D	SFM(Vc)	50	60	60	60	60	60	60	65	50
					IPT(fz)	.0004	.0007	.0010	.0014	.0023	.0021	.0027	.0029	.0028
					RPM	1600	1190	950	760	600	450	380	320	200
					IPM(FEED)	3	4	4	4	5	4	4	4	2
M	14.1	Stainless steel	0.5D	0.2D	SFM(Vc)	80	90	100	100	90	95	100	100	85
					IPT(fz)	.0004	.0008	.0011	.0015	.0021	.0022	.0028	.0030	.0030
					RPM	2510	1880	1500	1200	940	730	600	500	330
					IPM(FEED)	4	6	7	7	8	7	7	6	4
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	0.2D	SFM(Vc)	215	245	260	255	260	265	255	245	230
					IPT(fz)	.0006	.0010	.0014	.0020	.0028	.0029	.0037	.0041	.0041
					RPM	6620	4950	3960	3130	2640	2030	1560	1250	880
					IPM(FEED)	16	20	22	25	30	23	23	21	15
H	40	Hardened Cast Iron	0.3D	0.2D	SFM(Vc)	50	60	60	60	60	60	60	65	50
					IPT(fz)	.0004	.0007	.0010	.0014	.0023	.0021	.0027	.0029	.0028
					RPM	1600	1190	950	760	600	450	380	320	200
					IPM(FEED)	3	4	4	4	5	4	4	4	2

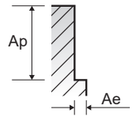


ONLY ONE END MILLS — RECOMMENDED CUTTING CONDITIONS

GYG65 SERIES — 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	245	270	290	305	285	295	320	310	285	310
					IPT(fz)	.0006	.0011	.0014	.0018	.0027	.0028	.0031	.0035	.0038	.0037
					RPM	7520	5550	4410	3730	2910	2260	1950	1570	1250	1180
					IPM(FEED)	18	25	24	27	31	25	24	22	19	17
	2		0.1D	1.5D	SFM(Vc)	225	245	265	255	260	265	275	260	260	260
					IPT(fz)	.0006	.0010	.0012	.0018	.0025	.0026	.0030	.0035	.0033	.0035
					RPM	6820	5010	4060	3130	2640	2030	1680	1320	1130	990
					IPM(FEED)	16	21	20	23	26	21	20	18	15	14
	3-4		0.1D	1.5D	SFM(Vc)	165	180	195	195	195	205	195	195	190	195
					IPT(fz)	.0006	.0011	.0013	.0018	.0023	.0026	.0034	.0034	.0036	.0036
					RPM	5010	3680	2960	2410	2010	1580	1200	990	820	750
					IPM(FEED)	11	16	15	17	19	16	16	14	12	11
	5		0.1D	1.5D	SFM(Vc)	100	125	135	135	125	130	135	130	130	130
					IPT(fz)	.0007	.0011	.0013	.0017	.0026	.0027	.0032	.0032	.0033	.0035
					RPM	3110	2540	2060	1680	1270	1000	820	670	560	490
					IPM(FEED)	8	11	10	11	13	11	10	9	7	7
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	225	245	265	255	260	265	275	260	260	260
					IPT(fz)	.0006	.0010	.0012	.0018	.0025	.0026	.0030	.0035	.0033	.0035
					RPM	6820	5010	4060	3130	2640	2030	1680	1320	1130	990
					IPM(FEED)	16	21	20	23	26	21	20	18	15	14
	7		0.1D	1.5D	SFM(Vc)	165	180	195	195	195	205	195	195	190	195
					IPT(fz)	.0006	.0011	.0013	.0018	.0023	.0026	.0034	.0034	.0036	.0036
					RPM	5010	3680	2960	2410	2010	1580	1200	990	820	750
					IPM(FEED)	11	16	15	17	19	16	16	14	12	11
	8		0.1D	1.5D	SFM(Vc)	100	125	135	135	125	130	135	130	130	130
					IPT(fz)	.0007	.0011	.0013	.0017	.0026	.0027	.0032	.0032	.0033	.0035
					RPM	3110	2540	2060	1680	1270	1000	820	670	560	490
					IPM(FEED)	8	11	10	11	13	11	10	9	7	7
	9		0.1D	1.5D	SFM(Vc)	90	105	110	115	110	105	110	110	110	115
					IPT(fz)	.0005	.0009	.0012	.0016	.0022	.0025	.0030	.0032	.0032	.0034
					RPM	2710	2140	1650	1400	1140	800	660	550	470	430
					IPM(FEED)	6	8	8	9	10	8	8	7	6	6
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	225	245	265	255	260	265	275	260	260	260
					IPT(fz)	.0006	.0010	.0012	.0018	.0025	.0026	.0030	.0035	.0033	.0035
					RPM	6820	5010	4060	3130	2640	2030	1680	1320	1130	990
					IPM(FEED)	16	21	20	23	26	21	20	18	15	14
	11.1		0.1D	1.5D	SFM(Vc)	100	125	135	135	125	130	135	130	130	130
					IPT(fz)	.0007	.0011	.0013	.0017	.0026	.0027	.0032	.0032	.0033	.0035
					RPM	3110	2540	2060	1680	1270	1000	820	670	560	490
					IPM(FEED)	8	11	10	11	13	11	10	9	7	7
	11.2		0.05D	1.5D	SFM(Vc)	60	70	75	80	80	75	75	75	75	80
					IPT(fz)	.0005	.0009	.0012	.0016	.0023	.0025	.0030	.0032	.0032	.0035
					RPM	1900	1470	1150	960	800	580	460	380	330	300
					IPM(FEED)	4	6	6	6	7	6	6	5	4	4
M	14.1	Stainless steel	0.1D	1.5D	SFM(Vc)	100	115	120	125	120	120	120	120	120	120
					IPT(fz)	.0005	.0009	.0012	.0015	.0022	.0025	.0030	.0032	.0032	.0035
					RPM	3010	2340	1800	1520	1240	900	740	600	530	460
					IPM(FEED)	6	8	9	9	11	9	9	8	7	6
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	225	245	265	255	260	265	275	260	260	260
					IPT(fz)	.0006	.0010	.0012	.0018	.0025	.0026	.0030	.0035	.0033	.0035
					RPM	6820	5010	4060	3130	2640	2030	1680	1320	1130	990
					IPM(FEED)	16	21	20	23	26	21	20	18	15	14
H	40	Hardened Cast Iron	0.05D	1.5D	SFM(Vc)	60	70	75	80	80	75	75	75	75	80
					IPT(fz)	.0005	.0009	.0012	.0016	.0023	.0025	.0030	.0032	.0032	.0035
					RPM	1900	1470	1150	960	800	580	460	380	330	300
					IPM(FEED)	4	6	6	6	7	6	6	5	4	4



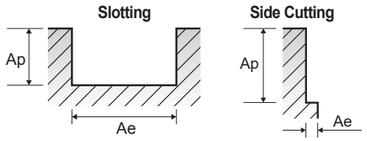
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

ONLY ONE END MILLS — RECOMMENDED CUTTING CONDITIONS

GYG66 SERIES — 4 FLUTE - SLOTTING & SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	SLOTTING Ae	SLOTTING Ap	SIDE CUTTING Ae	SIDE CUTTING Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
P	1-2	Non-alloy steel	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255
							IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	7020	4680	3510	2810	2570	1930	1540	1290	970
							IPM(FEED)	6	9	9	12	16	14	13	13	10
	3-4		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	210	205	210	210	230	230	230	230	230
							IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	6420	4210	3210	2570	2340	1750	1400	1170	880
							IPM(FEED)	5	7	8	11	14	13	12	12	9
	5		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	145	145	145	145	160	160	160	160	160
							IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0018	.0021	.0026	.0026
							RPM	4410	2940	2210	1760	1640	1230	980	820	610
							IPM(FEED)	3	5	6	8	10	9	8	9	6
	6	Low alloy steel	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255
							IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	7020	4680	3510	2810	2570	1930	1540	1290	970
							IPM(FEED)	6	9	9	12	16	14	13	13	10
	7		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	210	205	210	210	230	230	230	230	230
							IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	6420	4210	3210	2570	2340	1750	1400	1170	880
							IPM(FEED)	5	7	8	11	14	13	12	12	9
	8		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	145	145	145	145	160	160	160	160	160
							IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0018	.0021	.0026	.0026
							RPM	4410	2940	2210	1760	1640	1230	980	820	610
							IPM(FEED)	3	5	6	8	10	9	8	9	6
	9		1.0D	0.5D	0.15D	1.5D	SFM(Vc)	90	90	90	90	100	95	100	100	95
							IPT(fz)	.0002	.0004	.0006	.0009	.0013	.0016	.0017	.0022	.0021
							RPM	2710	1800	1350	1080	1000	730	600	500	360
							IPM(FEED)	2	3	3	4	5	5	4	4	3
	10	High alloyed steel, and tool steel	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255
							IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	7020	4680	3510	2810	2570	1930	1540	1290	970
							IPM(FEED)	6	9	9	12	16	14	13	13	10
	11.1		1.0D	0.5D	0.3D	1.5D	SFM(Vc)	145	145	145	145	160	160	160	160	160
							IPT(fz)	.0002	.0004	.0006	.0011	.0015	.0018	.0021	.0026	.0026
							RPM	4410	2940	2210	1760	1640	1230	980	820	610
							IPM(FEED)	3	5	6	8	10	9	8	9	6
	11.2		1.0D	0.3D	0.15D	1.5D	SFM(Vc)	90	90	90	90	100	95	100	100	95
							IPT(fz)	.0002	.0004	.0006	.0009	.0013	.0016	.0017	.0022	.0021
							RPM	2710	1800	1350	1080	1000	730	600	500	360
							IPM(FEED)	2	3	3	4	5	5	4	4	3
M	14.1	Stainless steel	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	155	160	160	160	155	155	155	155	155
							IPT(fz)	.0002	.0005	.0007	.0011	.0019	.0022	.0025	.0030	.0031
							RPM	4810	3210	2410	1930	1600	1200	960	800	600
							IPM(FEED)	4	7	7	9	12	11	10	10	7
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	0.3D	1.5D	SFM(Vc)	230	230	230	230	250	255	250	255	255
							IPT(fz)	.0002	.0005	.0006	.0011	.0015	.0019	.0021	.0026	.0025
							RPM	7020	4680	3510	2810	2570	1930	1540	1290	970
							IPM(FEED)	6	9	9	12	16	14	13	13	10
H	40	Chilled Cast Iron	1.0D	0.3D	0.15D	1.5D	SFM(Vc)	90	90	90	90	100	95	100	100	95
							IPT(fz)	.0002	.0004	.0006	.0009	.0013	.0016	.0017	.0022	.0021
							RPM	2710	1800	1350	1080	1000	730	600	500	360
							IPM(FEED)	2	3	3	4	5	5	4	4	3

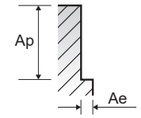


ONLY ONE END MILLS — RECOMMENDED CUTTING CONDITIONS

GYG69 SERIES — MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	250	285	280	285	285	285	295
					IPT(fz)	.0008	.0012	.0022	.0026	.0027	.0035	.0041
					RPM	3810	3490	2870	2180	1740	1450	1130
					IPM(FEED)	12	16	25	22	24	25	23
	2		0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225
					IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042
					RPM	3010	2770	2270	1630	1380	1140	850
					IPM(FEED)	10	13	19	18	19	19	18
	3-4		0.5D	1.5D	SFM(Vc)	140	170	155	160	155	155	155
					IPT(fz)	.0007	.0011	.0018	.0025	.0027	.0034	.0042
					RPM	2160	2050	1570	1230	960	800	590
					IPM(FEED)	6	9	11	12	13	14	12
	5		0.5D	1.5D	SFM(Vc)	115	125	130	130	130	130	135
					IPT(fz)	.0008	.0012	.0018	.0024	.0026	.0032	.0040
					RPM	1750	1520	1340	1000	800	670	510
					IPM(FEED)	6	7	9	10	10	11	10
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225
					IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042
					RPM	3010	2770	2270	1630	1380	1140	850
					IPM(FEED)	10	13	19	18	19	19	18
	7		0.5D	1.5D	SFM(Vc)	140	170	155	160	155	155	155
					IPT(fz)	.0007	.0011	.0018	.0025	.0027	.0034	.0042
					RPM	2160	2050	1570	1230	960	800	590
					IPM(FEED)	6	9	11	12	13	14	12
	8-9		0.5D	1.5D	SFM(Vc)	115	125	130	130	130	130	135
					IPT(fz)	.0008	.0012	.0018	.0024	.0026	.0032	.0040
					RPM	1750	1520	1340	1000	800	670	510
					IPM(FEED)	6	7	9	10	10	11	10
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225
					IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042
					RPM	3010	2770	2270	1630	1380	1140	850
					IPM(FEED)	10	13	19	18	19	19	18
	11.1		0.5D	1.5D	SFM(Vc)	115	125	130	130	130	130	135
					IPT(fz)	.0008	.0012	.0018	.0024	.0026	.0032	.0040
					RPM	1750	1520	1340	1000	800	670	510
					IPM(FEED)	6	7	9	10	10	11	10
	11.2		0.3D	1.5D	SFM(Vc)	80	90	90	90	90	90	90
					IPT(fz)	.0008	.0011	.0017	.0024	.0026	.0031	.0039
					RPM	1250	1080	940	700	560	470	350
					IPM(FEED)	4	5	6	7	7	7	7
M	14.1	Stainless steel	0.5D	1.5D	SFM(Vc)	130	140	140	140	140	145	145
					IPT(fz)	.0007	.0012	.0018	.0025	.0027	.0033	.0041
					RPM	1960	1720	1440	1080	860	740	550
					IPM(FEED)	6	8	10	11	12	12	11
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	195	225	225	215	225	225	225
					IPT(fz)	.0008	.0012	.0021	.0027	.0027	.0034	.0042
					RPM	3010	2770	2270	1630	1380	1140	850
					IPM(FEED)	10	13	19	18	19	19	18
H	40	Hardened Cast Iron	0.3D	1.5D	SFM(Vc)	80	90	90	90	90	90	90
					IPT(fz)	.0008	.0011	.0017	.0024	.0026	.0031	.0039
					RPM	1250	1080	940	700	560	470	350
					IPM(FEED)	4	5	6	7	7	7	7



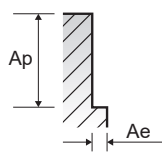
ONLY ONE END MILLS

RECOMMENDED CUTTING CONDITIONS

GYG68, GYG70 SERIES — MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1	1-1/4
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	205	235	235	235	235	235	245	175
					IPT(fz)	.0011	.0016	.0022	.0026	.0034	.0044	.0041	.0044
					RPM	3160	2890	2410	1800	1440	1200	940	670
					IPM(FEED)	10	14	21	18	20	21	19	18
	2		0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	130
					IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045
					RPM	2510	2290	1900	1350	1140	950	710	500
					IPM(FEED)	8	11	16	15	16	16	15	13
	3-4		0.5D	1.5D	SFM(Vc)	120	135	130	135	130	130	130	90
					IPT(fz)	.0009	.0015	.0018	.0025	.0034	.0042	.0042	.0045
					RPM	1800	1680	1340	1030	800	670	490	350
					IPM(FEED)	5	8	10	10	11	11	10	9
	5		0.5D	1.5D	SFM(Vc)	95	105	110	110	110	110	115	80
					IPT(fz)	.0011	.0016	.0017	.0024	.0032	.0040	.0041	.0043
					RPM	1450	1280	1140	850	660	550	430	300
					IPM(FEED)	5	6	8	8	8	9	8	8
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	130
					IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045
					RPM	2510	2290	1900	1350	1140	950	710	500
					IPM(FEED)	8	11	16	15	16	16	15	13
	7		0.5D	1.5D	SFM(Vc)	120	135	130	135	130	130	130	90
					IPT(fz)	.0009	.0015	.0018	.0025	.0034	.0042	.0042	.0045
					RPM	1800	1680	1340	1030	800	670	490	350
					IPM(FEED)	5	8	10	10	11	11	10	9
	8-9		0.5D	1.5D	SFM(Vc)	95	105	110	110	110	110	115	80
					IPT(fz)	.0011	.0016	.0017	.0024	.0032	.0040	.0041	.0043
					RPM	1450	1280	1140	850	660	550	430	300
					IPM(FEED)	5	6	8	8	8	9	8	8
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	130
					IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045
					RPM	2510	2290	1900	1350	1140	950	710	500
					IPM(FEED)	8	11	16	15	16	16	15	13
	11.1		0.5D	1.5D	SFM(Vc)	95	105	110	110	110	110	115	80
					IPT(fz)	.0011	.0016	.0017	.0024	.0032	.0040	.0041	.0043
					RPM	1450	1280	1140	850	660	550	430	300
					IPM(FEED)	5	6	8	8	8	9	8	8
	11.2		0.3D	1.5D	SFM(Vc)	70	70	80	75	75	75	80	55
					IPT(fz)	.0011	.0016	.0018	.0023	.0032	.0040	.0039	.0042
					RPM	1050	880	800	580	460	380	300	210
					IPM(FEED)	3	4	6	5	6	6	6	5
M	14.1	Stainless steel	0.5D	1.5D	SFM(Vc)	110	120	120	120	120	120	120	85
					IPT(fz)	.0010	.0015	.0018	.0025	.0034	.0042	.0040	.0043
					RPM	1650	1440	1200	900	720	600	460	330
					IPM(FEED)	5	7	9	9	10	10	9	9
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	1.5D	SFM(Vc)	165	185	185	175	185	185	185	130
					IPT(fz)	.0011	.0016	.0021	.0027	.0034	.0043	.0042	.0045
					RPM	2510	2290	1900	1350	1140	950	710	500
					IPM(FEED)	8	11	16	15	16	16	15	13
H	40	Hardened Cast Iron	0.3D	1.5D	SFM(Vc)	70	70	80	75	75	75	80	55
					IPT(fz)	.0011	.0016	.0018	.0023	.0032	.0040	.0039	.0042
					RPM	1050	880	800	580	460	380	300	210
					IPM(FEED)	3	4	6	5	6	6	6	5



Leading Through Innovation

HSS

SINE-POWER END MILLS

- High Performane HSS Rongher for Titanium and Titanium Alloys

SELECTION GUIDE

YG MILLING TOOLS

SERIES	E2F64
FLUTE	4&6
HELIX ANGLE	35°
CUTTING EDGE SHAPE	SQUARE
SIZE MIN	D3/4
SIZE MAX	D2
PAGE	C811

HSS Co8

SINE-POWER END MILLS

High Performane HSS Rongher for Titanium and Titanium Alloys

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C812

Uncoated

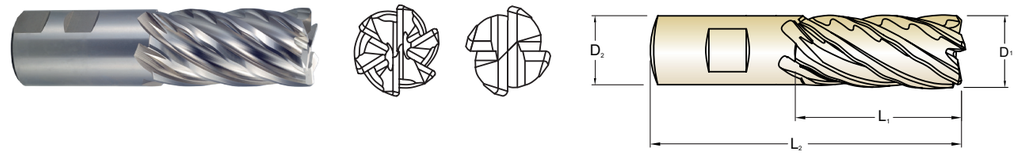
ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	
P	1	Non-alloy steel	About 0.15% C	Annealed	125		
	2		About 0.45% C	Annealed	190	13	
	3		About 0.45% C	Quenched & Tempered	250	25	
	4		About 0.75% C	Annealed	270	28	
	5		About 0.75% C	Quenched & Tempered	300	32	
	6	Low alloy steel		Annealed	180	10	
	7			Quenched & Tempered	275	29	
	8			Quenched & Tempered	300	32	
	9			Quenched & Tempered	350	38	
	10	High alloyed steel, and tool steel		Annealed	200	15	
	11			Quenched & Tempered	325	35	
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	
	13		Martensitic	Quenched & Tempered	240	23	
	14		Austenitic		180	10	
K	15	Grey cast iron	Pearlitic / ferritic		180	10	
	16		Pearlitic (Martensitic)		260	26	
	17	Nodular cast iron	Ferritic		160	3	
	18		Pearlitic		250	25	
	19	Malleable cast iron	Ferritic		130		
	20		Pearlitic		230	21	
N	21	Aluminum-wrought alloy	Not Curable		60		
	22		Curable	Hardened	100		
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		
	24		≤ 12% Si, Curable	Hardened	90		
	25		> 12% Si, Not Curable		130		
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		
	27		CuZn, CuSnZn (Brass)		90		
	28		CuSn, lead-free copper and electrolytic copper		100		
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic				
	30		Rubber, Wood, etc.				
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	
	32			Cured	280	30	
	33		Ni or Co Based	Annealed	250	25	
	34			Cured	350	38	
	35			Cast	320	34	
	36	Titanium Alloys	Pure Titanium		400 Rm		◎
	37		Alpha + Beta Alloys	Hardened	1050 Rm		◎
H	38	Hardened steel		Hardened	550	55	
	39			Hardened	630	60	
	40	Chilled Cast Iron		Cast	400	42	
	41	Hardened Cast Iron		Hardened	550	55	

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

YG **SINE-POWER END MILLS**

FLAT SHANK **E2F64 SERIES**

HSS Co8, 4&6 FLUTE



HSS Co8 | 4-6 | 35° | C x 45° | FLAT | UNCOATED p.C812

Unit : Inch

EDP No.	Mill Diameter D1	Shank Diameter D2	Length of Cut L1	Overall Length L2	Chamfer	No. of Flute
E2F64048	3/4	3/4	1-5/8	3-7/8	.030	4
E2F64901	3/4	3/4	2-1/4	4-1/2	.030	4
E2F64902	3/4	3/4	3	5-1/4	.030	4
E2F64064	1	1	2	4-1/2	.030	4
E2F64903	1	1	2	4-1/2	.030	6
E2F64904	1	1	3	5-1/2	.030	4
E2F64905	1	1	3	5-1/2	.030	6
E2F64906	1	1	4	6-1/2	.030	4
E2F64907	1	1	4	6-1/2	.030	6
E2F64116	1-1/4	1-1/4	2	4-1/2	.040	4
E2F64908	1-1/4	1-1/4	2	4-1/2	.040	6
E2F64909	1-1/4	1-1/4	3	5-1/2	.040	4
E2F64910	1-1/4	1-1/4	3	5-1/2	.040	6
E2F64911	1-1/4	1-1/4	4	6-1/2	.040	4
E2F64912	1-1/4	1-1/4	4	6-1/2	.040	6
E2F64132	1-1/2	1-1/4	2	4-1/2	.040	6
E2F64913	1-1/2	1-1/4	3	5-1/2	.040	6
E2F64914	1-1/2	1-1/4	4	6-1/2	.040	6
E2F64915	1-1/2	1-1/4	6	8-1/2	.040	6
E2F64200	2	2	2	5-3/4	.040	6
E2F64916	2	2	3	6-3/4	.040	6
E2F64917	2	2	4	7-3/4	.040	6
E2F64918	2	2	6	9-3/4	.040	6
E2F64919	2	2	8	11-3/4	.040	6

Cutting Dia. Tolerance(inch)	Shank Dia. Tolerance(inch)
0~ + .0030	- .0001~ - .0005

※ Radius, coatings and HSS-PM available on request

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended																				

ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended																◎	◎				

SINE-POWER END MILLS

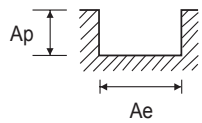
RECOMMENDED CUTTING CONDITIONS

E2F64 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

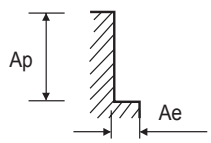
4&6 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						4FL			6FL			
						3/4	1	1-1/4	1	1-1/4	1-1/2	2
S	1-2	Titanium Alloys	1D	1D	SFM(Vc)	40	40	40	40	40	40	40
					IPT(fz)	.0025	.0033	.0041	.0022	.0027	.0033	.0066
					RPM	200	150	120	150	120	100	80
					IPM(FEED)	2	2	2	2	2	2	3
	3-4		1D	1D	SFM(Vc)	65	65	65	65	65	65	65
					IPT(fz)	.0023	.0040	.0050	.0027	.0034	.0040	.0054
					RPM	330	250	200	250	200	170	120
					IPM(FEED)	3	4	4	4	4	4	4



4&6 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)						
						4FL			6FL			
						3/4	1	1-1/4	1	1- 1/4	1-1/2	2
S	1-2	Titanium Alloys	0.5D	1.5D	SFM(Vc)	60	60	60	60	60	60	60
					IPT(fz)	.0025	.0033	.0041	.0022	.0027	.0033	.0043
					RPM	310	230	180	230	180	150	120
					IPM(FEED)	3	3	3	3	3	3	3
	3-4		0.5D	1.5D	SFM(Vc)	75	75	75	75	75	75	75
					IPT(fz)	.0026	.0035	.0044	.0023	.0029	.0035	.0047
					RPM	380	290	230	290	230	190	140
					IPM(FEED)	4	4	4	4	4	4	4



Leading Through Innovation

HSS-PM

TANK-POWER END MILLS

- High Toughness for Stainless Steels, Carbon steels and Alloy Steels / for General Application, Roughing & Finishing

SELECTION GUIDE

YG MILLING TOOLS

HSS-PM

TANK-POWER END MILLS

High Toughness for Stainless Steels, Carbon steels and Alloy Steels / for General Application, Roughing & Finishing

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C827

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc	E9983	E9984	E9985
		SERIES					E9983	E9984	E9985
		FLUTE					2	2	4
		HELIX ANGLE					30°	30°	30°
		CUTTING EDGE SHAPE					SQUARE	SQUARE	SQUARE
		SIZE MIN					D1/8	D1/8	D1/8
		SIZE MAX					D1	D1	D1
		PAGE					C816	C817	C818
							REGULAR LENGTH	REGULAR LENGTH DOUBLE	REGULAR LENGTH
							Uncoated	Uncoated	Uncoated
							TiAlN	TiAlN	TiAlN
							U.S.A Stock		
P	1	Non-alloy steel	About 0.15% C	Annealed	125		◎	◎	◎
	2		About 0.45% C	Annealed	190	13	◎	◎	◎
	3		About 0.45% C	Quenched & Tempered	250	25	◎	◎	◎
	4		About 0.75% C	Annealed	270	28	◎	◎	◎
	5		About 0.75% C	Quenched & Tempered	300	32	◎	◎	◎
	6	Low alloy steel		Annealed	180	10	◎	◎	◎
	7			Quenched & Tempered	275	29	◎	◎	◎
	8			Quenched & Tempered	300	32	◎	◎	◎
	9			Quenched & Tempered	350	38	◎	◎	◎
	10	High alloyed steel, and tool steel		Annealed	200	15	◎	◎	◎
	11			Quenched & Tempered	325	35	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15			
	13		Martensitic	Quenched & Tempered	240	23			
	14		Austenitic		180	10	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic		180	10	◎	◎	◎
	16		Pearlitic (Martensitic)		260	26	◎	◎	◎
	17	Nodular cast iron	Ferritic		160	3	◎	◎	◎
	18		Pearlitic		250	25	◎	◎	◎
	19	Malleable cast iron	Ferritic		130		◎	◎	◎
	20		Pearlitic		230	21	◎	◎	◎
N	21	Aluminum-wrought alloy	Not Curable		60				
	22		Curable	Hardened	100				
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75				
	24		≤ 12% Si, Curable	Hardened	90				
	25		> 12% Si, Not Curable		130				
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15			
	32			Cured	280	30			
	33		Ni or Co Based	Annealed	250	25			
	34			Cured	350	38			
	35			Cast	320	34			
	36	Titanium Alloys	Pure Titanium		400 Rm				
	37		Alpha + Beta Alloys	Hardened	1050 Rm				
H	38	Hardened steel		Hardened	550	55			
	39			Hardened	630	60			
	40	Chilled Cast Iron		Cast	400	42			
	41	Hardened Cast Iron		Hardened	550	55			

E9986	E9988	E9992	E9990	E9991	E9A86	E9A87	E9921	
4	3&4	2	3~6	3~6	3~6	3~6	5&6	
30°	60°	30°	30°	30°	30°	30°	35°	
SQUARE	SQUARE	BALL NOSE	ROUGHING	ROUGHING	ROUGHING	ROUGHING	ROUGHING	
D1/8	D1/4	R1/16	D1/4	D1/4	D5/16	D5/16	D1/2	
D1	D1	R1/2	D1-1/4	D1-1/4	D1-1/4	D1-1/4	D1-1/4	
C819	C820	C821	C822	C823	C824	C825	C826	
REGULAR LENGTH DOUBLE	REGULAR LENGTH	REGULAR LENGTH	REGULAR LENGTH FINE PITCH	REGULAR LENGTH COARSE PITCH	LONG LENGTH FINE PITCH	LONG LENGTH COARSE PITCH	EXTENDED NECK FINE PITCH CENTER CUTTING	
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	
TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	TiAlN	
U.S.A Stock								
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◎	◎	◎	◎	◎	◎	◎	◎	3
◎	◎	◎	◎	◎	◎	◎	◎	4
◎	◎	◎	◎	◎	◎	◎	◎	5
◎	◎	◎	◎	◎	◎	◎	◎	6
◎	◎	◎	◎	◎	◎	◎	◎	7
◎	◎	◎	◎	◎	◎	◎	◎	8
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○	○	○	○	○	○	○	○	26 N
○	○	○	○	○	○	○	○	27
○	○	○	○	○	○	○	○	28
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								41

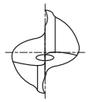
CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

TANK-POWER END MILLS

FLAT SHANK **E9983** SERIES

PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to HRc45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.



HSS PM | 2 | 30° | FLAT | UNCOATED | TiAlN

p.C827

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E9983008	E9983008TF	1/8	3/8	3/8	2-5/16
E9983012	E9983012TF	3/16	3/8	7/16	2-5/16
E9983016	E9983016TF	1/4	3/8	1/2	2-5/16
E9983020	E9983020TF	5/16	3/8	9/16	2-5/16
E9983024	E9983024TF	3/8	3/8	9/16	2-5/16
E9983032	E9983032TF	1/2	1/2	1	3
E9983040	E9983040TF	5/8	5/8	1-5/16	3-7/16
E9983048	E9983048TF	3/4	3/4	1-5/16	3-7/16
E9983056	E9983056TF	7/8	7/8	1-1/2	3-3/4
E9983064	E9983064TF	1	1	1-5/8	4-1/8

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9984** SERIES

PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH DOUBLE

▶ Series E9984, E9984 two flute, end mills are the double end version of E9983, E9983 single-end tools.
Faster feed & speed than normal HSS can be applied to hardened steels up to HRc45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.

HSS PM | 2 | 30° | FLAT | UNCOATED | TiAlN

p.C827

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E9984008	E9984008TF	1/8	3/8	3/8	3-1/16
E9984012	E9984012TF	3/16	3/8	7/16	3-1/8
E9984016	E9984016TF	1/4	3/8	1/2	3-1/8
E9984020	E9984020TF	5/16	3/8	9/16	3-1/8
E9984024	E9984024TF	3/8	3/8	9/16	3-1/8
E9984032	E9984032TF	1/2	1/2	13/16	3-3/4
E9984040	E9984040TF	5/8	5/8	1-1/8	4-1/2
E9984048	E9984048TF	3/4	3/4	1-5/16	5
E9984056	E9984056TF	7/8	7/8	1-9/16	5-1/2
E9984064	E9984064TF	1	1	1-5/8	5-7/8

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9985** SERIES

PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to HRc45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.

HSS PM | 4 | 30° | FLAT | UNCOATED | TiAlN

p.C828

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E9985008	E9985008TF	1/8	3/8	3/8	2-5/16
E9985012	E9985012TF	3/16	3/8	1/2	2-3/8
E9985016	E9985016TF	1/4	3/8	5/8	2-7/16
E9985020	E9985020TF	5/16	3/8	3/4	2-1/2
E9985024	E9985024TF	3/8	3/8	3/4	2-1/2
E9985032	E9985032TF	1/2	1/2	1-1/4	3-1/4
E9985040	E9985040TF	5/8	5/8	1-5/8	3-3/4
E9985048	E9985048TF	3/4	3/4	1-5/8	3-7/8
E9985056	E9985056TF	7/8	7/8	1-7/8	4-1/8
E9985064	E9985064TF	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9986** SERIES

PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH DOUBLE

▶ Series E9986,EP986 four flute end mills are the double end version of E9985,EP985 single-end tools.
Faster feed & speed than normal HSS can be applied to hardened steels up to HRc45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.

HSS PM | 4 | 30° | FLAT | UNCOATED | TiAlN

p.C828

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E9986008	E9986008TF	1/8	3/8	3/8	3-1/16
E9986012	E9986012TF	3/16	3/8	1/2	3-1/4
E9986016	E9986016TF	1/4	3/8	5/8	3-3/8
E9986020	E9986020TF	5/16	3/8	3/4	3-1/2
E9986024	E9986024TF	3/8	3/8	3/4	3-1/2
E9986032	E9986032TF	1/2	1/2	1	4-1/8
E9986040	E9986040TF	5/8	5/8	1-3/8	5
E9986048	E9986048TF	3/4	3/4	1-5/8	5-5/8
E9986056	E9986056TF	7/8	7/8	1-7/8	6-1/8
E9986064	E9986064TF	1	1	1-7/8	6-3/8

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~-.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

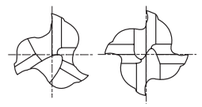
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9988** SERIES

PREMIUM HSS-PM, 3&4 FLUTE 60° HELIX REGULAR LENGTH

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to HRc45. Accordingly, HSS-PM made by powder metallurgy makes much higher productivity possible.



HSS PM | 3&4 | 60° | FLAT | UNCOATED | TiAlN

p.C829

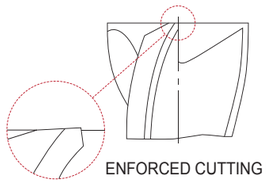
◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Overall Length
E9988016	E9988016TF	1/4	3/8	5/8	2-7/16	3
E9988020	E9988020TF	5/16	3/8	3/4	2-1/2	3
E9988024	E9988024TF	3/8	3/8	3/4	2-1/2	3
E9988028	E9988028TF	7/16	3/8	1	2-11/16	3
E9988032	E9988032TF	1/2	1/2	1-1/4	3-1/4	3
E9988040	E9988040TF	5/8	5/8	1-5/8	3-3/4	3
E9988048	E9988048TF	3/4	3/4	1-5/8	3-7/8	3
E9988901	E9988901TF	7/8	3/4	1-7/8	4-1/8	4
E9988056	E9988056TF	7/8	7/8	1-7/8	4-1/8	4
E9988064	E9988064TF	1	1	2	4-1/2	4

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.



ENFORCED CUTTING EDGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9992** SERIES

PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH BALL NOSE

▶ The two flute ball end mills are designed for milling of radius bottom slots, fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut. The two flute design provides good chip removal ability in slotting.

HSS PM | 2 | 30° | R ±.001 | FLAT | UNCOATED | TiAlN

p.C830

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Radius of Ball Nose R (±.001)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
E9992008	E9992008TF	R1/16	1/8	3/8	3/8	2-5/16
E9992012	E9992012TF	R3/32	3/16	3/8	1/2	2-3/8
E9992016	E9992016TF	R1/8	1/4	3/8	5/8	2-7/16
E9992020	E9992020TF	R5/32	5/16	3/8	3/4	2-1/2
E9992024	E9992024TF	R3/16	3/8	3/8	3/4	2-1/2
E9992032	E9992032TF	R1/4	1/2	1/2	1	3
E9992040	E9992040TF	R5/16	5/8	5/8	1-3/8	3-1/2
E9992048	E9992048TF	R3/8	3/4	3/4	1-5/8	3-7/8
E9992056	E9992056TF	R7/16	7/8	7/8	2	4-1/4
E9992064	E9992064TF	R1/2	1	1	2-1/4	4-3/4

Mill Dia. Tolerance (inch)
0~-.0015

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

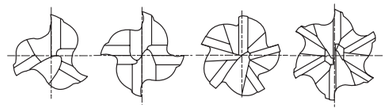
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9990** SERIES

PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.



HSS PM | FINE | 3-6 | 30° | FLAT | UNCOATED | TiAlN

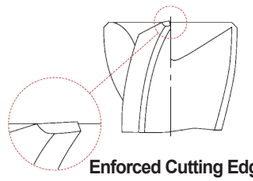
p.C831

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E9990016	E9990016TF	1/4	3/8	5/8	2-7/16	3
E9990907	E9990907TF	1/4	3/8	1-1/8	2-15/16	3
E9990020	E9990020TF	5/16	3/8	3/4	2-1/2	3
E9990024	E9990024TF	3/8	3/8	3/4	2-1/2	4
E9990028	E9990028TF	7/16	3/8	1	2-11/16	4
E9990032	E9990032TF	1/2	1/2	1-1/4	3-1/4	4
E9990908	E9990908TF	1/2	1/2	1-5/8	3-5/8	4
E9990036	E9990036TF	9/16	1/2	1-3/8	3-3/8	4
E9990040	E9990040TF	5/8	5/8	1-5/8	3-3/4	4
E9990048	E9990048TF	3/4	3/4	1-5/8	3-7/8	4
E9990948	E9990948TF	3/4	5/8	1-5/8	3-7/8	4
E9990909	E9990909TF	3/4	3/4	2-1/2	4-3/4	4
E9990056	E9990056TF	7/8	7/8	1-7/8	4-1/8	5
E9990901	E9990901TF	7/8	3/4	1-7/8	4-1/8	5
E9990064	E9990064TF	1	1	2	4-1/2	5
E9990905	E9990905TF	1	1	3	5-1/2	5
E9990108	E9990108TF	1-1/8	1	2	4-1/2	6
E9990116	E9990116TF	1-1/4	1-1/4	2	4-1/2	6
E9990906	E9990906TF	1-1/4	1-1/4	3	5-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

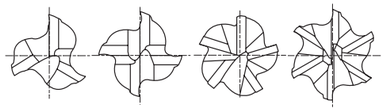
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9991** SERIES

PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.



HSS PM | COARSE | 3-6 | 30° | FLAT | UNCOATED | TiAlN

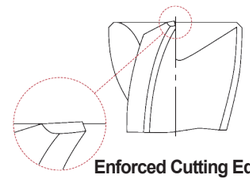
p.C831

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E9991016	E9991016TF	1/4	3/8	5/8	2-7/16	3
E9991902	E9991902TF	1/4	3/8	1-1/8	2-15/16	3
E9991020	E9991020TF	5/16	3/8	3/4	2-1/2	3
E9991024	E9991024TF	3/8	3/8	3/4	2-1/2	4
E9991028	E9991028TF	7/16	3/8	1	2-11/16	4
E9991032	E9991032TF	1/2	1/2	1-1/4	3-1/4	4
E9991903	E9991903TF	1/2	1/2	1-5/8	3-5/8	4
E9991036	E9991036TF	9/16	1/2	1-3/8	3-3/8	4
E9991040	E9991040TF	5/8	5/8	1-5/8	3-3/4	4
E9991048	E9991048TF	3/4	3/4	1-5/8	3-7/8	4
E9991948	E9991948TF	3/4	5/8	1-5/8	3-7/8	4
E9991904	E9991904TF	3/4	3/4	2-1/2	4-3/4	4
E9991056	E9991056TF	7/8	7/8	1-7/8	4-1/8	5
E9991901	E9991901TF	7/8	3/4	1-7/8	4-1/8	5
E9991064	E9991064TF	1	1	2	4-1/2	5
E9991905	E9991905TF	1	1	3	5-1/2	5
E9991108	E9991108TF	1-1/8	1	2	4-1/2	6
E9991116	E9991116TF	1-1/4	1-1/4	2	4-1/2	6
E9991906	E9991906TF	1-1/4	1-1/4	3	5-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron	Nodular cast iron	Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

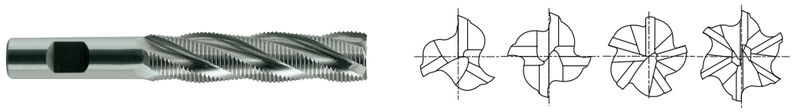
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9A86** SERIES

PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.



HSS PM | FINE | 3-6 | 30° | FLAT | UNCOATED | TiAlN

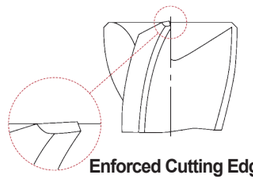
p.C831

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E9A86020	E9A86020TF	5/16	3/8	1-3/8	3-3/16	3
E9A86024	E9A86024TF	3/8	3/8	1-1/2	3-1/4	4
E9A86924	E9A86924TF	3/8	3/8	1-1/2	4	4
E9A86032	E9A86032TF	1/2	1/2	2	4	4
E9A86040	E9A86040TF	5/8	5/8	2-1/2	4-5/8	4
E9A86048	E9A86048TF	3/4	5/8	3	5-1/8	4
E9990902	E9990902TF	3/4	3/4	3	5-1/4	4
E9A86056	E9A86056TF	7/8	3/4	3-1/2	5-3/4	5
E9A86956	E9A86956TF	7/8	7/8	3-1/2	5-3/4	5
E9990903	E9990903TF	1	1	4	6-1/2	5
E9A86116	E9A86116TF	1-1/4	3/4	4	6-1/4	6
E9990904	E9990904TF	1-1/4	1-1/4	4	6-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	

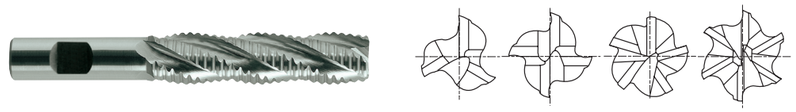
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9A87** SERIES

PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.



HSS PM | COARSE | 3-6 | 30° | FLAT | UNCOATED | TiAlN

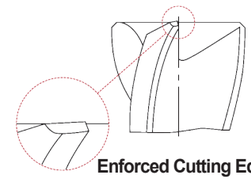
p.C831

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No. of Flute
E9A87020	E9A87020TF	5/16	3/8	1-3/8	3-3/16	3
E9A87024	E9A87024TF	3/8	3/8	1-1/2	3-1/4	4
E9A87924	E9A87924TF	3/8	3/8	1-1/2	4	4
E9A87032	E9A87032TF	1/2	1/2	2	4	4
E9A87040	E9A87040TF	5/8	5/8	2-1/2	4-5/8	4
E9A87048	E9A87048TF	3/4	5/8	3	5-1/8	4
E9A87948	E9A87948TF	3/4	3/4	3	5-1/4	4
E9A87056	E9A87056TF	7/8	3/4	3-1/2	5-3/4	5
E9A87956	E9A87956TF	7/8	7/8	3-1/2	5-3/4	5
E9A87064	E9A87064TF	1	1	4	6-1/2	5
E9A87116	E9A87116TF	1-1/4	3/4	4	6-1/4	6
E9A87917	E9A87917TF	1-1/4	1-1/4	4	6-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K						
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25			21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎	

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

TANK-POWER END MILLS

FLAT SHANK **E9921** SERIES

PREMIUM HSS-PM, MULTI FLUTE FINE PITCH ROUGHING EXTENDED NECK CENTER CUTTING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.

HSS PM | FINE | 5&6 | 35° | FLAT | UNCOATED | TiAlN

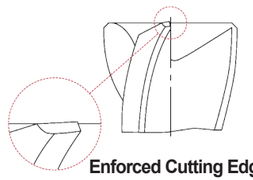
p.C831

◆ U.S.A Stock

Unit : Inch

EDP No. UNCOATED	EDP No. TiAlN COATED	Mill Diameter	Shank Diameter	Length of Cut	Reach Extended Neck	Overall Length	No. of Flute
EP20322	EP20322F	1/2	1/2	1-1/4	3	5	5
EP20402	EP20402F	5/8	5/8	1-5/8	4	6-1/8	5
EP20482	EP20482F	3/4	3/4	1-5/8	4	6-1/4	5
EP20484	EP20484F	3/4	3/4	1-5/8	6	8-1/4	5
EP20642	EP20642F	1	1	2	4	6-1/2	6
EP20643	EP20643F	1	1	2	6	8-1/2	6
EP21161	EP21161F	1-1/4	1-1/4	2	4	6-1/2	6
EP21162	EP21162F	1-1/4	1-1/4	2	6	8-1/2	6

Mill Dia.	Tolerance (inch)
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎	◎	◎	◎	◎	◎

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○													

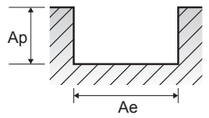
TANK-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

E9983, E9984 SERIES — 2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	150	185	205	205	205	215	215	195	180	185
					IPT(fz)	.0006	.0011	.0014	.0019	.0024	.0028	.0035	.0040	.0039	.0037
					RPM	4600	3800	3150	2500	2100	1650	1300	1000	800	710
					IPM(FEED)	6	9	9	9	10	9	9	8	6	5
	2		1.0D	0.5D	SFM(Vc)	125	155	175	170	175	175	180	160	155	155
					IPT(fz)	.0007	.0011	.0014	.0020	.0025	.0030	.0033	.0038	.0038	.0040
					RPM	3800	3150	2650	2100	1800	1350	1100	820	680	590
					IPM(FEED)	5	7	8	8	9	8	7	6	5	5
	3-4		1.0D	0.5D	SFM(Vc)	105	130	135	140	140	135	140	140	130	120
					IPT(fz)	.0007	.0012	.0016	.0020	.0026	.0033	.0036	.0037	.0038	.0042
					RPM	3150	2600	2100	1700	1450	1050	860	710	560	470
					IPM(FEED)	4	6	7	7	8	7	6	5	4	4
	5		1.0D	0.5D	SFM(Vc)	70	80	90	90	90	85	90	90	85	90
					IPT(fz)	.0007	.0011	.0014	.0018	.0023	.0029	.0034	.0036	.0036	.0037
					RPM	2150	1650	1350	1100	910	670	540	450	380	340
					IPM(FEED)	3	4	4	4	4	4	4	3	3	3
	6	Low alloy steel	1.0D	0.5D	SFM(Vc)	125	155	175	170	175	175	180	160	155	155
					IPT(fz)	.0007	.0011	.0014	.0020	.0025	.0030	.0033	.0038	.0038	.0040
					RPM	3800	3150	2650	2100	1800	1350	1100	820	680	590
					IPM(FEED)	5	7	8	8	9	8	7	6	5	5
	7		1.0D	0.5D	SFM(Vc)	105	130	135	140	140	135	140	140	130	120
					IPT(fz)	.0007	.0012	.0016	.0020	.0026	.0033	.0036	.0037	.0038	.0042
					RPM	3150	2600	2100	1700	1450	1050	860	710	560	470
					IPM(FEED)	4	6	7	7	8	7	6	5	4	4
	8		1.0D	0.5D	SFM(Vc)	70	80	90	90	90	85	90	90	85	90
					IPT(fz)	.0007	.0011	.0014	.0018	.0023	.0029	.0034	.0036	.0036	.0037
					RPM	2150	1650	1350	1100	910	670	540	450	380	340
					IPM(FEED)	3	4	4	4	4	4	4	3	3	3
	9		1.0D	0.5D	SFM(Vc)	55	65	70	70	70	70	70	70	70	60
					IPT(fz)	.0007	.0010	.0014	.0018	.0024	.0028	.0033	.0035	.0033	.0036
					RPM	1650	1350	1050	860	720	530	430	360	300	240
					IPM(FEED)	2	3	3	3	3	3	3	3	2	2
	10	High alloyed steel, and tool steel	1.0D	0.5D	SFM(Vc)	125	155	175	170	175	175	180	160	155	155
					IPT(fz)	.0007	.0011	.0014	.0020	.0025	.0030	.0033	.0038	.0038	.0040
					RPM	3800	3150	2650	2100	1800	1350	1100	820	680	590
					IPM(FEED)	5	7	8	8	9	8	7	6	5	5
	11.1		1.0D	0.5D	SFM(Vc)	70	80	90	90	90	85	90	90	85	90
					IPT(fz)	.0007	.0011	.0014	.0018	.0023	.0029	.0034	.0036	.0036	.0037
					RPM	2150	1650	1350	1100	910	670	540	450	380	340
					IPM(FEED)	3	4	4	4	4	4	4	3	3	3
M	14.1	Stainless steel	1.0D	0.5D	SFM(Vc)	55	65	70	70	70	70	70	70	70	60
					IPT(fz)	.0007	.0010	.0014	.0018	.0024	.0028	.0033	.0035	.0033	.0036
					RPM	1650	1350	1050	860	720	530	430	360	300	240
					IPM(FEED)	2	3	3	3	3	3	3	3	2	2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D	SFM(Vc)	125	155	175	170	175	175	180	160	155	155
					IPT(fz)	.0007	.0011	.0014	.0020	.0025	.0030	.0033	.0038	.0038	.0040
					RPM	3800	3150	2650	2100	1800	1350	1100	820	680	590
					IPM(FEED)	5	7	8	8	9	8	7	6	5	5

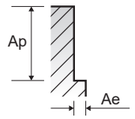


TANK-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E9985, E9986 SERIES — 4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	205	225	250	255	245	250	260	275	235	260
					IPT(fz)	.0007	.0011	.0015	.0018	.0025	.0029	.0031	.0032	.0038	.0037
					RPM	6300	4600	3800	3100	2500	1900	1600	1400	1030	1000
					IPM(FEED)	18	20	22	22	25	22	20	18	16	15
	2		0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215
					IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036
					RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830
					IPM(FEED)	14	16	18	19	21	19	17	15	12	12
	3-4		0.1D	1.5D	SFM(Vc)	140	150	165	165	165	165	165	165	155	160
					IPT(fz)	.0006	.0010	.0013	.0018	.0022	.0028	.0033	.0035	.0036	.0035
					RPM	4250	3040	2500	2000	1680	1270	1000	830	680	620
					IPM(FEED)	10	13	13	14	15	14	13	12	10	9
	5		0.1D	1.5D	SFM(Vc)	90	100	110	115	115	115	115	115	110	110
					IPT(fz)	.0007	.0010	.0014	.0017	.0022	.0027	.0032	.0031	.0034	.0033
					RPM	2700	2070	1700	1400	1180	860	690	580	470	420
					IPM(FEED)	7	9	10	9	10	9	9	7	6	6
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215
					IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036
					RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830
					IPM(FEED)	14	16	18	19	21	19	17	15	12	12
	7		0.1D	1.5D	SFM(Vc)	140	150	165	165	165	165	165	165	155	160
					IPT(fz)	.0006	.0010	.0013	.0018	.0022	.0028	.0033	.0035	.0036	.0035
					RPM	4250	3040	2500	2000	1680	1270	1000	830	680	620
					IPM(FEED)	10	13	13	14	15	14	13	12	10	9
	8		0.1D	1.5D	SFM(Vc)	90	100	110	115	115	115	115	115	110	110
					IPT(fz)	.0007	.0010	.0014	.0017	.0022	.0027	.0032	.0031	.0034	.0033
					RPM	2700	2070	1700	1400	1180	860	690	580	470	420
					IPM(FEED)	7	9	10	9	10	9	9	7	6	6
	9		0.1D	1.5D	SFM(Vc)	75	85	90	95	95	90	100	90	90	95
					IPT(fz)	.0005	.0009	.0013	.0016	.0020	.0010	.0027	.0030	.0033	.0034
					RPM	2320	1780	1400	1150	960	690	620	470	390	360
					IPM(FEED)	5	6	7	7	8	3	7	6	5	5
	10	High alloyed steel, and tool steel	0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215
					IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036
					RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830
					IPM(FEED)	14	16	18	19	21	19	17	15	12	12
	11.1		0.1D	1.5D	SFM(Vc)	90	100	110	115	115	115	115	115	110	110
					IPT(fz)	.0007	.0010	.0014	.0017	.0022	.0027	.0032	.0031	.0034	.0033
					RPM	2700	2070	1700	1400	1180	860	690	580	470	420
					IPM(FEED)	7	9	10	9	10	9	9	7	6	6
M	14.1	Stainless steel	0.1D	0.5D	SFM(Vc)	75	85	90	95	95	90	100	90	90	95
					IPT(fz)	.0005	.0009	.0013	.0016	.0020	.0010	.0027	.0030	.0033	.0034
					RPM	2320	1780	1400	1150	960	690	620	470	390	360
					IPM(FEED)	5	6	7	7	8	3	7	6	5	5
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	195	200	215	215	215	225	230	225	215	215
					IPT(fz)	.0006	.0010	.0014	.0018	.0023	.0027	.0030	.0033	.0033	.0036
					RPM	6000	4100	3300	2600	2200	1720	1410	1150	930	830
					IPM(FEED)	14	16	18	19	21	19	17	15	12	12

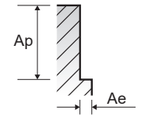


TANK-POWER END MILLS — RECOMMENDED CUTTING CONDITIONS

E9988 SERIES — 3&4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	7/8	1
P	1-2	Non-alloy steel	0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165
					IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075
					RPM	3850	3050	2700	1850	1300	900	720	630
					IPM(FEED)	8	8	9	10	11	15	17	19
	3-4		0.3D	1.5D	SFM(Vc)	165	170	165	155	140	115	110	110
					IPT(fz)	.0007	.0010	.0012	.0018	.0034	.0068	.0074	.0096
					RPM	2500	2100	1700	1200	850	580	480	420
					IPM(FEED)	5	6	6	6	9	12	14	16
	5		0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90
					IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075
					RPM	1900	1700	1450	960	690	480	380	340
					IPM(FEED)	4	4	4	4	5	8	9	10
	6	Low alloy steel	0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165
					IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075
					RPM	3850	3050	2700	1850	1300	900	720	630
					IPM(FEED)	8	8	9	10	11	15	17	19
	7		0.3D	1.5D	SFM(Vc)	165	170	165	155	140	115	110	110
					IPT(fz)	.0007	.0010	.0012	.0018	.0034	.0068	.0074	.0096
					RPM	2500	2100	1700	1200	850	580	480	420
					IPM(FEED)	5	6	6	6	9	12	14	16
	8-9		0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90
					IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075
					RPM	1900	1700	1450	960	690	480	380	340
					IPM(FEED)	4	4	4	4	5	8	9	10
	10	High alloyed steel, and tool steel	0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165
					IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075
					RPM	3850	3050	2700	1850	1300	900	720	630
					IPM(FEED)	8	8	9	10	11	15	17	19
	11.1		0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90
					IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075
					RPM	1900	1700	1450	960	690	480	380	340
					IPM(FEED)	4	4	4	4	5	8	9	10
M	14.1	Stainless steel	0.3D	1.5D	SFM(Vc)	125	140	140	125	115	95	85	90
					IPT(fz)	.0006	.0007	.0009	.0014	.0026	.0055	.0058	.0075
					RPM	1900	1700	1450	960	690	480	380	340
					IPM(FEED)	4	4	4	4	5	8	9	10
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.3D	1.5D	SFM(Vc)	250	250	265	240	215	175	165	165
					IPT(fz)	.0007	.0009	.0010	.0017	.0028	.0054	.0058	.0075
					RPM	3850	3050	2700	1850	1300	900	720	630
					IPM(FEED)	8	8	9	10	11	15	17	19



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

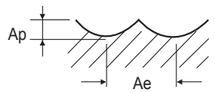
TANK-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

E9992 SERIES — 2 FLUTE BALL NOSE - PROFILING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1
P	1	Non-alloy steel	0.5D	0.2D	SFM(Vc)	225	250	265	265	270	275	260	265	250	235
					IPT(fz)	.0009	.0015	.0021	.0028	.0036	.0042	.0052	.0054	.0057	.0059
					RPM	6800	5100	4050	3250	2750	2100	1600	1350	1100	890
					IPM(FEED)	12	15	17	18	20	18	17	15	13	11
	2		0.5D	0.2D	SFM(Vc)	175	195	205	210	205	210	205	205	200	180
					IPT(fz)	.0008	.0013	.0018	.0024	.0032	.0038	.0044	.0047	.0049	.0051
					RPM	5300	4000	3150	2550	2100	1600	1250	1050	870	690
					IPM(FEED)	8	10	11	12	13	12	11	10	8	7
	3-4		0.5D	0.2D	SFM(Vc)	115	130	135	140	140	145	140	135	130	115
					IPT(fz)	.0006	.0011	.0015	.0020	.0026	.0031	.0035	.0039	.0041	.0044
					RPM	3550	2650	2100	1700	1450	1100	860	700	560	450
					IPM(FEED)	5	6	6	7	8	7	6	5	5	4
	5		0.5D	0.2D	SFM(Vc)	60	65	70	70	70	70	70	70	70	60
					IPT(fz)	.0006	.0010	.0014	.0017	.0024	.0027	.0033	.0035	.0035	.0036
					RPM	1850	1350	1100	860	700	530	430	360	300	240
					IPM(FEED)	2	3	3	3	3	3	3	3	2	2
	6	Low alloy steel	0.5D	0.2D	SFM(Vc)	175	195	205	210	205	210	205	205	200	180
					IPT(fz)	.0008	.0013	.0018	.0024	.0032	.0038	.0044	.0047	.0049	.0051
					RPM	5300	4000	3150	2550	2100	1600	1250	1050	870	690
					IPM(FEED)	8	10	11	12	13	12	11	10	8	7
	7		0.5D	0.2D	SFM(Vc)	115	130	135	140	140	145	140	135	130	115
					IPT(fz)	.0006	.0011	.0015	.0020	.0026	.0031	.0035	.0039	.0041	.0044
					RPM	3550	2650	2100	1700	1450	1100	860	700	560	450
					IPM(FEED)	5	6	6	7	8	7	6	5	5	4
	8-9		0.5D	0.2D	SFM(Vc)	60	65	70	70	70	70	70	70	70	60
					IPT(fz)	.0006	.0010	.0014	.0017	.0024	.0027	.0033	.0035	.0035	.0036
					RPM	1850	1350	1100	860	700	530	430	360	300	240
					IPM(FEED)	2	3	3	3	3	3	3	3	2	2
	10	High alloyed steel, and tool steel	0.5D	0.2D	SFM(Vc)	175	195	205	210	205	210	205	205	200	180
					IPT(fz)	.0008	.0013	.0018	.0024	.0032	.0038	.0044	.0047	.0049	.0051
					RPM	5300	4000	3150	2550	2100	1600	1250	1050	870	690
					IPM(FEED)	8	10	11	12	13	12	11	10	8	7
	11.1		0.5D	0.2D	SFM(Vc)	60	65	70	70	70	70	70	70	70	60
					IPT(fz)	.0006	.0010	.0014	.0017	.0024	.0027	.0033	.0035	.0035	.0036
					RPM	1850	1350	1100	860	700	530	430	360	300	240
					IPM(FEED)	2	3	3	3	3	3	3	3	2	2
M	14.1	Stainless steel	0.5D	0.2D	SFM(Vc)	60	65	70	70	70	70	70	70	70	60
					IPT(fz)	.0006	.0010	.0014	.0017	.0024	.0027	.0033	.0035	.0035	.0036
					RPM	1850	1350	1100	860	700	530	430	360	300	240
					IPM(FEED)	2	3	3	3	3	3	3	3	2	2
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.5D	0.2D	SFM(Vc)	175	195	205	210	205	210	205	205	200	180
					IPT(fz)	.0008	.0013	.0018	.0024	.0032	.0038	.0044	.0047	.0049	.0051
					RPM	5300	4000	3150	2550	2100	1600	1250	1050	870	690
					IPM(FEED)	8	10	11	12	13	12	11	10	8	7



※ The Feed, in long & extra long types, should be reduced by around 50%.

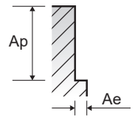
TANK-POWER END MILLS

RECOMMENDED CUTTING CONDITIONS

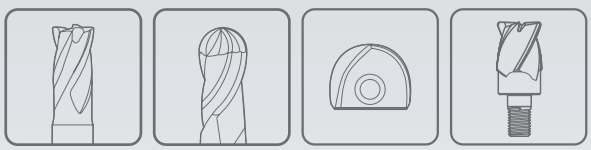
E9990, E9991, E9A86, E9A87, E9921 SERIES — MULTI FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	3/8	1/2	5/8	3/4	7/8	1
P	1-2	Non-alloy steel	0.5D	1.5D	SFM(Vc)	175	185	190	190	190	195	195
					IPT(fz)	.0010	.0017	.0024	.0031	.0038	.0034	.0038
					RPM	2650	1900	1450	1150	960	850	740
					IPM(FEED)	8	13	14	14	14	15	14
	3-4		0.5D	1.5D	SFM(Vc)	135	145	145	150	155	140	145
					IPT(fz)	.0010	.0017	.0026	.0031	.0037	.0037	.0038
					RPM	2050	1500	1100	910	780	620	560
					IPM(FEED)	6	10	11	11	11	11	11
	5		0.5D	1.5D	SFM(Vc)	95	105	105	105	105	100	105
					IPT(fz)	.0010	.0015	.0025	.0031	.0037	.0035	.0037
					RPM	1450	1050	810	630	540	450	400
					IPM(FEED)	4	6	8	8	8	8	7
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	175	185	190	190	190	195	195
					IPT(fz)	.0010	.0017	.0024	.0031	.0038	.0034	.0038
					RPM	2650	1900	1450	1150	960	850	740
					IPM(FEED)	8	13	14	14	14	15	14
	7		0.5D	1.5D	SFM(Vc)	135	145	145	150	155	140	145
					IPT(fz)	.0010	.0017	.0026	.0031	.0037	.0037	.0038
					RPM	2050	1500	1100	910	780	620	560
					IPM(FEED)	6	10	11	11	11	11	11
	8		0.5D	1.5D	SFM(Vc)	95	105	105	105	105	100	105
					IPT(fz)	.0010	.0015	.0025	.0031	.0037	.0035	.0037
					RPM	1450	1050	810	630	540	450	400
					IPM(FEED)	4	6	8	8	8	8	7
	9		0.5D	1.5D	SFM(Vc)	80	85	85	85	85	85	80
					IPT(fz)	.0009	.0015	.0023	.0029	.0034	.0033	.0038
					RPM	1200	890	670	530	450	380	320
					IPM(FEED)	3	5	6	6	6	6	6
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	175	185	190	190	190	195	195
					IPT(fz)	.0010	.0017	.0024	.0031	.0038	.0034	.0038
					RPM	2650	1900	1450	1150	960	850	740
					IPM(FEED)	8	13	14	14	14	15	14
	11.1		0.5D	1.5D	SFM(Vc)	95	105	105	105	105	100	105
					IPT(fz)	.0010	.0015	.0025	.0031	.0037	.0035	.0037
					RPM	1450	1050	810	630	540	450	400
					IPM(FEED)	4	6	8	8	8	8	7
M	14.1	Stainless steel	0.5D	1.5D	SFM(Vc)	125	125	125	125	125	125	125
					IPT(fz)	.0010	.0017	.0024	.0032	.0038	.0034	.0038
					RPM	1900	1270	950	760	630	540	470
					IPM(FEED)	6	9	9	10	10	9	9
K	15-20	Grey cast iron Nodular cast iron Malleable cast iron	0.1D	1.5D	SFM(Vc)	175	185	190	190	190	195	195
					IPT(fz)	.0010	.0017	.0024	.0031	.0038	.0034	.0038
					RPM	2650	1900	1450	1150	960	850	740
					IPM(FEED)	8	13	14	14	14	15	14

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.



Global Cutting Tool Leader **YG-1**



MILLING

YG

Leading Through Innovation

HSS Co8 & HSS

COBALT & HSS END MILLS

- General Purpose / Coating Available

SELECTION GUIDE

YG MILLING TOOLS

HSS Co8 & HSS
COBALT & HSS
END MILLS

General Purpose / Coating Available

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C903

| | | |

SELECTION GUIDE

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HSS Co8 & HSS
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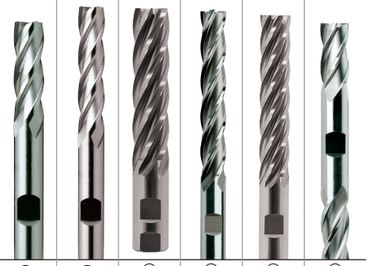
◎ : Excellent ○ : Good

Recommended cutting conditions : p.C903

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc
P	1	Non-alloy steel	About 0.15% C	Annealed	125	
	2		About 0.45% C	Annealed	190	13
	3		About 0.45% C	Quenched & Tempered	250	25
	4		About 0.75% C	Annealed	270	28
	5		About 0.75% C	Quenched & Tempered	300	32
	6	Low alloy steel		Annealed	180	10
	7			Quenched & Tempered	275	29
	8			Quenched & Tempered	300	32
	9			Quenched & Tempered	350	38
	10	High alloyed steel, and tool steel		Annealed	200	15
	11			Quenched & Tempered	325	35
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15
	13		Martensitic	Quenched & Tempered	240	23
	14		Austenitic		180	10
K	15	Grey cast iron	Pearlitic / ferritic		180	10
	16		Pearlitic (Martensitic)		260	26
	17	Nodular cast iron	Ferritic		160	3
	18		Pearlitic		250	25
	19	Malleable cast iron	Ferritic		130	
	20		Pearlitic		230	21
N	21	Aluminum-wrought alloy	Not Curable		60	
	22		Curable	Hardened	100	
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75	
	24		≤ 12% Si, Curable	Hardened	90	
	25		> 12% Si, Not Curable		130	
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110	
	27		CuZn, CuSnZn (Brass)		90	
	28		CuSn, lead-free copper and electrolytic copper		100	
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic			
	30		Rubber, Wood, etc.			
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15
	32			Cured	280	30
	33		Ni or Co Based	Annealed	250	25
	34			Cured	350	38
	35			Cast	320	34
	36	Titanium Alloys	Pure Titanium		400 Rm	
	37		Alpha + Beta Alloys	Hardened	1050 Rm	
H	38	Hardened steel		Hardened	550	55
	39			Hardened	630	60
	40	Chilled Cast Iron		Cast	400	42
	41	Hardened Cast Iron		Hardened	550	55

Inch						
SERIES	E2039 E2042	E2040 E1040	E2162 E1162	E2041 E1041	E2175 E1175	E2053 E1053
FLUTE	4~8	4	6	4	6	4
HELIX ANGLE	30°	30°	30°	30°	30°	30°
CUTTING EDGE SHAPE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE
SIZE MIN	D1	D1/4	D1/2	D1/4	D1/2	D1/8
SIZE MAX	D2	D1-1/2	D2	D1-1/4	D2	D1
PAGE	C864	C865		C866		C867
	MEDIUM LENGTH CENTER CUTTING	LONG LENGTH CENTER CUTTING	LONG LENGTH CENTER CUTTING	EXTRA LONG LENGTH CENTER CUTTING	EXTRA LONG LENGTH CENTER CUTTING	REGULAR LENGTH DOUBLE CENTER CUTTING
	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
	HSS Co8	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS



◎	◎	◎	◎	◎	◎	1
◎	◎	◎	◎	◎	◎	2
◎	◎	◎	◎	◎	◎	3
◎	◎	◎	◎	◎	◎	4
○	○	○	○	○	○	5
◎	◎	◎	◎	◎	◎	6
◎	◎	◎	◎	◎	◎	7
○	○	○	○	○	○	8
○	○	○	○	○	○	9
◎	◎	◎	◎	◎	◎	10
○	○	○	○	○	○	11
						12
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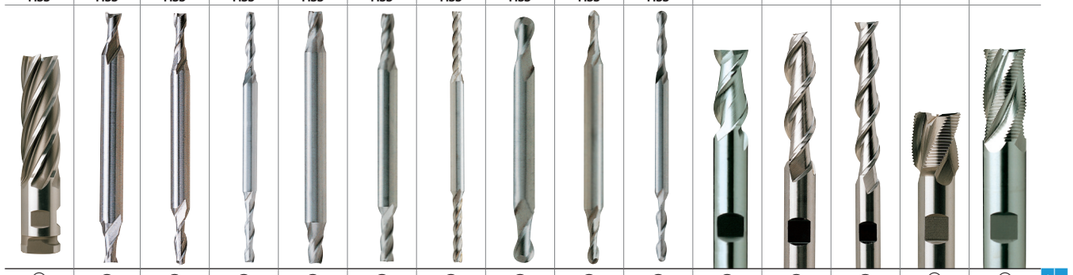
○	○	○	○	○	○	21
○	○	○	○	○	○	22
○	○	○	○	○	○	23
○	○	○	○	○	○	24
○	○	○	○	○	○	25
○	○	○	○	○	○	26
○	○	○	○	○	○	27
○	○	○	○	○	○	28
						29
○	○	○	○	○	○	30
						31
						32
						33
						34
						35
○	○	○	○	○	○	36
○	○	○	○	○	○	37
						38
						39
						40
						41

Inch															
E2100 E1100	E2001 E1001	E2003 E1003	E2005 E1005	E2002 E1002	E2004 E1004	E2006 E1006	E2008 E1008	E2013 E1013	E2015 E1015	E1070	E1071	E1072	E2086	E2085
6	2	2	2	4	4	4	2	2	2	2	2	2	4&5	3~5
30°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	30°&39°	42°	42°	42°	30°	30°
SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	SQUARE	BALL NOSE	BALL NOSE	BALL NOSE	SQUARE	SQUARE	SQUARE	ROUGHING	ROUGHING
D2	D1/32	D1/32	D1/16	D1/16	D1/16	D1/16	R1/32	R1/64	R1/32	D1/4	D1/4	D1/4	D1/4	D1/4
D2	D3/16	D3/16	D3/16	D3/16	D3/16	D3/16	R3/32	R3/32	R3/32	D2	D2	D1-1/2	D1	D1
C869	C870	C871	C872	C873	C874	C875	C876	C877	C878	C879	C880		C881	C882
REGULAR COMBINATION 2 SHANK CENTER CUTTING	STUB LENGTH MINIATURE DOUBLE	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	STUB LENGTH MINIATURE DOUBLE	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	STUB LENGTH MINIATURE DOUBLE	REGULAR LENGTH MINIATURE DOUBLE	LONG LENGTH MINIATURE DOUBLE	REGULAR & MEDIUM LENGTH ALUMINUM	LONG LENGTH ALUMINUM	EXTRA LONG LENGTH ALUMINUM	STUB LENGTH FINE PITCH CENTER CUTTING	REGULAR LENGTH FINE PITCH CENTER CUTTING
Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated	Uncoated
HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS Co8 & HSS	HSS	HSS	HSS	HSS Co8	HSS Co8



CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

SELECTION GUIDE

YG MILLING TOOLS

HSS Co8 & HSS
COBALT & HSS
END MILLS

General Purpose / Coating Available

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.C903

| | | |

COBALT & HSS END MILLS

SUPER CUTTING END MILLS

DESCRIPTION				YG-1	**ANSI	REMARK
TYPE	NO. OF FLUTE	LENGTH OF CUT	TYPE OF END			
SINGLE END	2	REGULAR LONG EX. LONG	ALL	+ .0010 .0000 * (+ .0015 .0000)	+ .0030 .0000	
	MULTIPLE	ALL	ALL	+ .0010 .0000 * (+ .0015 .0000)	+ .0030 .0000	
KEY WAY	2	ALL	CENTER CUTTING	+ .0000 - .0015	+ .0000 - .0015	
DOUBLE END	2	REGULAR	ALL	.0000 - .0010 * (.0000 - .0020)	.0000 - .0015	
	4	ALL	CENTER CUTTING	.0000 - .0010 * (.0000 - .0020)	.0000 - .0015	
	4	ALL	NON CENTER CUTTING	+ .0010 .0000 * (.0000 - .0020)	+ .0030 .0000 * (.0000 - .0025)	
3/16 SHANK DOUBLE END	2	STUB REGULAR	ALL	.0000 - .0010 * (.0000 - .0020)	.0000 - .0015	
		LONG	ALL	+ .0010 .0000 * (.0000 - .0020)	+ .0030 .0000 * (.0000 - .0025)	
	4	ALL	ALL	+ .0010 .0000 * (.0000 - .0020)	+ .0030 .0000 * (.0000 - .0025)	
ROUGHING	MULTIPLE	ALL	ALL	+ .0060 .0000	+ .025 - .005	
ROUGHING & FINISHING	MULTIPLE	REGULAR	ALL	+ .0025 + .0005		
HELICAL 60°	3.4	REGULAR	CENTER CUTTING	+ .0010 .0000 * (+ .0015 .0000)		
THROW AWAY 1/4 SHANK	3	ALL	CENTER CUTTING	- .0005 - .0013		

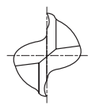
* The shank of End Mills is the same diameter as the cutting portion.
** ANSI B94-19-1977 published by the American Society of Mechanical Engineers.

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2030 SERIES**
HSS (M2) FLAT SHANK **E1030 SERIES**

HSS Co8 & HSS, 2 FLUTE REGULAR LENGTH

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. All shanks are flatted for holder set screw. These are designed for slotting, drilling, pocketing and general-purpose operation.



HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED p.C903

Unit : Inch

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)				
01289	01039	1/8	3/8	3/8	2-5/16
01291	01041	5/32	3/8	7/16	2-5/16
01293	01043	3/16	3/8	7/16	2-5/16
01295	01045	7/32	3/8	1/2	2-5/16
01297	01047	1/4	3/8	1/2	2-5/16
01299	01049	9/32	3/8	9/16	2-5/16
01301	01051	5/16	3/8	9/16	2-5/16
01303	01053	11/32	3/8	9/16	2-5/16
01305	01055	3/8	3/8	9/16	2-5/16
01308	01058	13/32	3/8	13/16	2-1/2
01312	01062	7/16	3/8	13/16	2-1/2
01316	01066	15/32	3/8	13/16	2-1/2
01320	01070	1/2	3/8	13/16	2-1/2
01321	01071	1/2	1/2	1	3
01328	01078	9/16	1/2	1-1/8	3-1/8
01336	01086	5/8	1/2	1-1/8	3-1/8
01337	01087	5/8	5/8	1-5/16	3-7/16
01348	01098	11/16	5/8	1-5/16	3-7/16
01357	01107	3/4	1/2	1-5/16	3-5/16
01358	01108	3/4	5/8	1-5/16	3-7/16
01359	01109	3/4	3/4	1-5/16	3-7/16
01373	01123	13/16	5/8	1-1/2	3-5/8
01391	01141	7/8	3/4	1-1/2	3-3/4
01394	01144	7/8	7/8	1-1/2	3-3/4
01409	01159	15/16	7/8	1-1/2	3-3/4
01420	01170	1	5/8	1-1/2	3-5/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

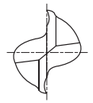
COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2030** SERIES

HSS (M2) FLAT SHANK **E1030** SERIES

HSS Co8 & HSS, 2 FLUTE REGULAR LENGTH

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. All shanks are flatted for holder set screw. These are designed for slotting, drilling, pocketing and general-purpose operation.



HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED p.C903

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
01422	01172	1	3/4	1-1/2	3-3/4
01426	01176	1	1	1-5/8	4-1/8
01435	01185	1-1/8	1	1-5/8	4-1/8
01445	01195	1-1/4	1-1/4	1-5/8	4-1/8
01451	01201	1-3/8	1	1-5/8	4-1/8
01453	01203	1-3/8	1-1/4	1-5/8	4-1/8
01459	01209	1-1/2	1	1-5/8	4-1/8
01461	01211	1-1/2	1-1/4	1-5/8	4-1/8
01469	01219	1-3/4	1-1/4	1-5/8	4-1/8
01477	01227	2	1-1/4	1-5/8	4-1/8
* 01480	* 01230	2	2	2	5-3/4

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

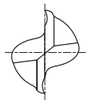
COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2080** SERIES

HSS (M2) FLAT SHANK **E1080** SERIES

HSS Co8 & HSS, 2 FLUTE LONG LENGTH

▶ Longer flute length than E2030 type and allows deeper cutting.



HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED p.C903

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
02297	02047	1/4	3/8	1-1/4	3-1/8
02301	02051	5/16	3/8	1-3/8	3-1/8
02305	02055	3/8	3/8	1-1/2	3-1/4
02321	02071	1/2	1/2	2	4
02337	02087	5/8	5/8	2	4-1/8
02359	02109	3/4	3/4	2-1/4	4-1/2
02394	02144	7/8	7/8	2-1/2	4-3/4
02426	02176	1	1	3	5-1/2
02435	02185	1-1/8	1	3	5-1/2
02443	02193	1-1/4	1	3	5-1/2
02445	02195	1-1/4	1-1/4	3	5-1/2
02461	02211	1-1/2	1-1/4	3	5-1/2
02469	02219	1-3/4	1-1/4	3	5-1/2
02477	02227	2	1-1/4	3	5-1/2
* 02482	* 02232	2	2	3	6-3/4

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

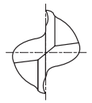
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2033** SERIES
HSS (M2) FLAT SHANK **E1033** SERIES

HSS Co8 & HSS, 2 FLUTE EXTENDED LENGTH

▶Provided with the longest flute length and suitable for high accuracy machining of deep step.



HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED

p.C903

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
03289	03039	1/8	3/8	3/8	13/16	2-3/8
03293	03043	3/16	3/8	1/2	1-1/8	2-11/16
03297	03047	1/4	3/8	5/8	1-1/2	3-1/16
03301	03051	5/16	3/8	3/4	1-3/4	3-5/16
03305	03055	3/8	3/8	3/4	1-3/4	3-5/16
03321	03071	1/2	1/2	1	2-7/32	4
03337	03087	5/8	5/8	1-3/8	2-23/32	4-5/8
03359	03109	3/4	3/4	1-5/8	3-11/32	5-3/8
03394	03144	7/8	7/8	2	4	6
03426	03176	1	1	2-1/2	4-31/32	7-1/4
03445	03195	1-1/4	1-1/4	3	4-31/32	7-1/4

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2050** SERIES
HSS (M2) FLAT SHANK **E1050** SERIES

HSS Co8 & HSS, 2 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2050 two flute end mills are the double-end version of E2030 single-end tools. Same excellent tool geometry for slotting, keying and general purpose milling, plus the added economy offered by the double-end design.

HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED

p.C903

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
11289	11039	1/8	3/8	3/8	3-1/16
11290	11040	9/64	3/8	7/16	3-1/8
11291	11041	5/32	3/8	7/16	3-1/8
11292	11042	11/64	3/8	7/16	3-1/8
11293	11043	3/16	3/8	7/16	3-1/8
11294	11044	13/64	3/8	1/2	3-1/8
11295	11045	7/32	3/8	1/2	3-1/8
11296	11046	15/64	3/8	1/2	3-1/8
11297	11047	1/4	3/8	1/2	3-1/8
11298	11048	17/64	3/8	9/16	3-1/8
11299	11049	9/32	3/8	9/16	3-1/8
11300	11050	19/64	3/8	9/16	3-1/8
11301	11051	5/16	3/8	9/16	3-1/8
11302	11052	21/64	3/8	9/16	3-1/8
11303	11053	11/32	3/8	9/16	3-1/8
11304	11054	23/64	3/8	9/16	3-1/8
11305	11055	3/8	3/8	9/16	3-1/8
11307	11057	25/64	1/2	13/16	3-3/4
11309	11059	13/32	1/2	13/16	3-3/4
11311	11061	27/64	1/2	13/16	3-3/4
11313	11063	7/16	1/2	13/16	3-3/4
11315	11065	29/64	1/2	13/16	3-3/4
11317	11067	15/32	1/2	13/16	3-3/4
11319	11069	31/64	1/2	13/16	3-3/4
11321	11071	1/2	1/2	13/16	3-3/4
11326	11076	17/32	5/8	1-1/8	4-1/2

▶ NEXT PAGE

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

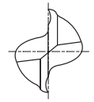
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2050** SERIES
HSS (M2) FLAT SHANK **E1050** SERIES

HSS Co8 & HSS, 2 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2050 two flute end mills are the double-end version of E2030 single-end tools. Same excellent tool geometry for slotting, keying and general purpose milling, plus the added economy offered by the double-end design.



HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED p.C903

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
11330	11080	9/16	5/8	1-1/8	4-1/2
11334	11084	19/32	5/8	1-1/8	4-1/2
11337	11087	5/8	5/8	1-1/8	4-1/2
11344	11094	21/32	3/4	1-5/16	5
11350	11100	11/16	3/4	1-5/16	5
11354	11104	23/32	3/4	1-5/16	5
11359	11109	3/4	3/4	1-5/16	5
11368	11118	25/32	7/8	1-9/16	5-1/2
11377	11127	13/16	7/8	1-9/16	5-1/2
11384	11134	27/32	7/8	1-9/16	5-1/2
11394	11144	7/8	7/8	1-9/16	5-1/2
11402	11152	29/32	1	1-5/8	5-7/8
11410	11160	15/16	1	1-5/8	5-7/8
11417	11167	31/32	1	1-5/8	5-7/8
11426	11176	1	1	1-5/8	5-7/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2110** SERIES
HSS (M2) FLAT SHANK **E1110** SERIES

HSS Co8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE

▶ The two flute ball end mills are designed for milling of radius bottom slots, fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut. The two flute design provides good chip removal ability in slotting.

HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED p.C914

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Radius of Ball Nose R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
41289	41039	R1/16	1/8	3/8	3/8	2-5/16
41293	41043	R3/32	3/16	3/8	1/2	2-3/8
41297	41047	R1/8	1/4	3/8	5/8	2-7/16
41301	41051	R5/32	5/16	3/8	3/4	2-1/2
41305	41055	R3/16	3/8	3/8	3/4	2-1/2
41313	41063	R7/32	7/16	1/2	1	3
41321	41071	R1/4	1/2	1/2	1	3
41328	41078	R9/32	9/16	1/2	1-1/8	3-1/8
41336	41086	R5/16	5/8	1/2	1-1/8	3-1/8
41337	41087	R5/16	5/8	5/8	1-3/8	3-1/2
41357	41107	R3/8	3/4	1/2	1-5/16	3-5/16
41359	41109	R3/8	3/4	3/4	1-5/8	3-7/8
41391	41141	R7/16	7/8	3/4	2	4-1/4
41394	41144	R7/16	7/8	7/8	2	4-1/4
41422	41172	R1/2	1	3/4	2-1/4	4-1/2
41426	41176	R1/2	1	1	2-1/4	4-3/4
41431	41181	R9/16	1-1/8	3/4	1-5/8	3-7/8
41435	41185	R9/16	1-1/8	1	2-1/4	4-3/4
41439	41189	R5/8	1-1/4	3/4	1-5/8	3-7/8
41445	41195	R5/8	1-1/4	1-1/4	2-1/2	5
41449	41199	R11/16	1-3/8	3/4	1-5/8	4-1/8
41453	41203	R11/16	1-3/8	1-1/4	2-1/2	5
41457	41207	R3/4	1-1/2	3/4	1-5/8	4-1/8
41461	41211	R3/4	1-1/2	1-1/4	2-1/2	5
41478	41227	R1	2	1-1/4	2-1/2	5

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2111** SERIES
HSS (M2) FLAT SHANK **E1111** SERIES

HSS Co8 & HSS, 2 FLUTE EXTENDED LENGTH BALL NOSE

▶Longer flute length than E2110 type and suitable for high efficient copying process and deep cutting of die mold corner radius.

HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED p.C914

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length
8% COBALT (M42)	HSS (M2)	R					
42289	**42039**	R1/16	**1/8**	3/8	3/8	-	2-3/8
42293	**42043**	R3/32	**3/16**	3/8	1/2	1-1/8	2-11/16
42297	**42047**	R1/8	**1/4**	3/8	5/8	1-1/2	3-1/16
42301	**42051**	R5/32	**5/16**	3/8	3/4	1-3/4	3-5/16
42305	**42055**	R3/16	**3/8**	3/8	3/4	1-3/4	3-5/16
42313	**42063**	R7/32	**7/16**	1/2	1	1-7/8	3-11/16
42321	**42071**	R1/4	**1/2**	1/2	1	2-1/4	4
42337	**42087**	R5/16	**5/8**	5/8	1-3/8	2-3/4	4-5/8
42359	**42109**	R3/8	**3/4**	3/4	1-5/8	3-3/8	5-3/8
42426	**42176**	R1/2	**1**	1	2-1/2	5	7-1/4

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

YG COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2112** SERIES
HSS (M2) FLAT SHANK **E1112** SERIES

HSS Co8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE DOUBLE

▶ Same construction features as E2110 end mill in a more economical version.
Removes more material per grind. Machine ground notch assures positive anchorage in tool holder.

HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED p.C914

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)	R				
45289	**45039**	R1/16	**1/8**	3/8	3/8	3-1/16
45293	**45043**	R3/32	**3/16**	3/8	7/16	3-1/8
45297	**45047**	R1/8	**1/4**	3/8	1/2	3-1/8
45301	**45051**	R5/32	**5/16**	3/8	9/16	3-1/8
45305	**45055**	R3/16	**3/8**	3/8	9/16	3-1/8
45313	**45063**	R7/32	**7/16**	1/2	13/16	3-3/4
45321	**45071**	R1/4	**1/2**	1/2	13/16	3-3/4
45337	**45087**	R5/16	**5/8**	5/8	1-1/8	4-1/2
45359	**45109**	R3/8	**3/4**	3/4	1-5/16	5
45426	**45176**	R1/2	**1**	1	1-5/8	5-7/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2031** SERIES
HSS (M2) FLAT SHANK **E1031** SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH

▶ Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
04289	04039	1/8	3/8	3/8	2-5/16
04290	04040	9/64	3/8	7/16	2-3/8
04291	04041	5/32	3/8	7/16	2-3/8
04292	04042	11/64	3/8	1/2	2-3/8
04293	04043	3/16	3/8	1/2	2-3/8
04294	04044	13/64	3/8	9/16	2-7/16
04295	04045	7/32	3/8	9/16	2-7/16
04296	04046	15/64	3/8	5/8	2-7/16
04297	04047	1/4	3/8	5/8	2-7/16
04298	04048	17/64	3/8	11/16	2-1/2
04299	04049	9/32	3/8	11/16	2-1/2
04300	04050	19/64	3/8	3/4	2-1/2
04301	04051	5/16	3/8	3/4	2-1/2
04302	04052	21/64	3/8	3/4	2-1/2
04303	04053	11/32	3/8	3/4	2-1/2
04304	04054	23/64	3/8	3/4	2-1/2
04305	04055	3/8	3/8	3/4	2-1/2
04306	04056	25/64	3/8	1	2-11/16
04308	04058	13/32	3/8	1	2-11/16
04310	04060	27/64	3/8	1	2-11/16
04312	04062	7/16	3/8	1	2-11/16
04315	04065	29/64	1/2	1-1/4	3-1/4
04317	04067	15/32	1/2	1-1/4	3-1/4
04319	04069	31/64	1/2	1-1/4	3-1/4

▶ NEXT PAGE

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK E2031 SERIES
HSS (M2) FLAT SHANK E1031 SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH

▶ Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
04320	04070	1/2	3/8	1	2-11/16
04321	04071	1/2	1/2	1-1/4	3-1/4
04324	04074	17/32	1/2	1-3/8	3-3/8
04328	04078	9/16	1/2	1-3/8	3-3/8
04332	04082	19/32	1/2	1-3/8	3-3/8
04336	04086	5/8	1/2	1-3/8	3-3/8
04337	04087	5/8	5/8	1-5/8	3-3/4
04340	04090	21/32	1/2	1-5/8	3-5/8
04348	04098	11/16	5/8	1-5/8	3-3/4
04352	04102	23/32	1/2	1-5/8	3-5/8
04357	04107	3/4	1/2	1-5/8	3-5/8
04358	04108	3/4	5/8	1-5/8	3-3/4
04359	04109	3/4	3/4	1-5/8	3-7/8
04364	04114	25/32	5/8	1-7/8	4
04375	04125	13/16	3/4	1-7/8	4-1/8
04380	04130	27/32	5/8	1-7/8	4
04391	04141	7/8	3/4	1-7/8	4-1/8
04394	04144	7/8	7/8	1-7/8	4-1/8
04399	04149	29/32	3/4	1-7/8	4-1/8
04407	04157	15/16	3/4	1-7/8	4-1/8
04414	04164	31/32	3/4	1-7/8	4-1/8
04420	04170	1	5/8	1-7/8	4
04422	04172	1	3/4	1-7/8	4-1/8
04426	04176	1	1	2	4-1/2

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2032** SERIES
HSS (M2) FLAT SHANK **E1032** SERIES

HSS Co8 & HSS, 6 FLUTE REGULAR LENGTH

▶ Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.

HSS Co8 | HSS | 6 | 30° | FLAT | UNCOATED p.C920

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
04338	04088	5/8	5/8	1-5/8	3-3/4
04360	04110	3/4	3/4	1-5/8	3-7/8
04376	04126	13/16	3/4	1-7/8	4-1/8
04390	04140	7/8	5/8	1-7/8	4
04395	04145	7/8	7/8	1-7/8	4-1/8
04405	04155	15/16	5/8	1-7/8	4
04421	04171	1	5/8	1-7/8	4
04427	04177	1	1	2	4-1/2
04432	04182	1-1/8	3/4	2	4-1/4
04436	04186	1-1/8	1	2	4-1/2
04440	04190	1-1/4	3/4	2	4-1/4
04444	04194	1-1/4	1	2	4-1/2
04446	04196	1-1/4	1-1/4	2	4-1/2
04452	04202	1-3/8	1	2	4-1/2
04460	04210	1-1/2	1	2	4-1/2
04462	04212	1-1/2	1-1/4	2	4-1/2
04470	04220	1-3/4	1-1/4	2	4-1/2
04478	04228	2	1-1/4	2	4-1/2
* 04481	* 04231	2	2	2	5-3/4

* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○											

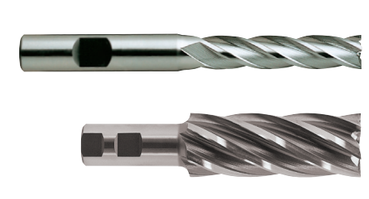
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2034 / E2035** SERIES
HSS (M2) FLAT SHANK **E1034 / E1035** SERIES

HSS Co8 & HSS, 4&6 FLUTE LONG LENGTH

▶ Longer flute length than E2031 type and allows deeper cutting. Easy to regrind.



HSS Co8 | HSS | 4&6 | 30° | FLAT | UNCOATED p.C917, .C920

E2034(8% COBALT) , E1034(HSS) Series ■ 4 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
05297	05047	1/4	3/8	1-1/4	3-1/16
05301	05051	5/16	3/8	1-3/8	3-1/8
05305	05055	3/8	3/8	1-1/2	3-1/4
05313	05063	7/16	1/2	1-3/4	3-3/4
05321	05071	1/2	1/2	2	4
05337	05087	5/8	5/8	2-1/2	4-5/8
05359	05109	3/4	3/4	3	5-1/4
05394	05144	7/8	7/8	3-1/2	5-3/4
05426	05176	1	1	4	6-1/2

E2035(8% COBALT) , E1035(HSS) Series ■ 6 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
05436	05186	1-1/8	1	4	6-1/2
05444	05194	1-1/4	1	4	6-1/2
05446	05196	1-1/4	1-1/4	4	6-1/2
05460	05210	1-1/2	1	4	6-1/2
05462	05212	1-1/2	1-1/4	4	6-1/2
05470	05220	1-3/4	1-1/4	4	6-1/2
05478	05228	2	1-1/4	4	6-1/2
* 05485	* 05235	2	2	4	7-3/4

* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○											

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2036 / E2037** SERIES
HSS (M2) FLAT SHANK **E1036 / E1037** SERIES

HSS Co8 & HSS, 4&6 FLUTE EXTRA LONG LENGTH

▶Provided with the longest flute length and suitable for high accuracy machining of deep step. Easy to regrind.

HSS Co8 | HSS | 4&6 | 30° | FLAT | UNCOATED p.C917, .C920

E2036(8% COBALT) , E1036(HSS) Series ■ 4 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
06297	06047	1/4	3/8	1-3/4	3-9/16
06301	06051	5/16	3/8	2	3-3/4
06305	06055	3/8	3/8	2-1/2	4-1/4
06321	06071	1/2	1/2	3	5
06337	06087	5/8	5/8	4	6-1/8
06359	06109	3/4	3/4	4	6-1/4
06394	06144	7/8	7/8	5	7-1/4
06426	06176	1	1	6	8-1/2

E2037(8% COBALT) , E1037(HSS) Series ■ 6 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
06446	06196	1-1/4	1-1/4	6	8-1/2
06462	06212	1-1/2	1-1/4	8	10-1/2
* 06491	* 06241	2	2	8	11-3/4

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2051** SERIES
HSS (M2) FLAT SHANK **E1051** SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2051 four flute end mills are the double-end version of E2031 four flute tools and are used for the same type of finishing operation. Two tools on one shank saves on sharpening set-up as well as on initial tool costs. Easy to regrind.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
12289	12039	1/8	3/8	3/8	3-1/16
12290	12040	9/64	3/8	7/16	3-1/8
12291	12041	5/32	3/8	7/16	3-1/8
12292	12042	11/64	3/8	1/2	3-1/4
12293	12043	3/16	3/8	1/2	3-1/4
12294	12044	13/64	3/8	9/16	3-1/4
12295	12045	7/32	3/8	9/16	3-1/4
12296	12046	15/64	3/8	5/8	3-3/8
12297	12047	1/4	3/8	5/8	3-3/8
12298	12048	17/64	3/8	11/16	3-3/8
12299	12049	9/32	3/8	11/16	3-3/8
12300	12050	19/64	3/8	3/4	3-1/2
12301	12051	5/16	3/8	3/4	3-1/2
12302	12052	21/64	3/8	3/4	3-1/2
12303	12053	11/32	3/8	3/4	3-1/2
12304	12054	23/64	3/8	3/4	3-1/2
12305	12055	3/8	3/8	3/4	3-1/2
12307	12057	25/64	1/2	1	4-1/8
12309	12059	13/32	1/2	1	4-1/8
12311	12061	27/64	1/2	1	4-1/8
12313	12063	7/16	1/2	1	4-1/8
12315	12065	29/64	1/2	1	4-1/8
12317	12067	15/32	1/2	1	4-1/8
12319	12069	31/64	1/2	1	4-1/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2051** SERIES
HSS (M2) FLAT SHANK **E1051** SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2051 four flute end mills are the double-end version of E2031 four flute tools and are used for the same type of finishing operation. Two tools on one shank saves on sharpening set-up as well as on initial tool costs. Easy to regrind.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
12321	12071	1/2	1/2	1	4-1/8
12330	12080	9/16	5/8	1-3/8	5
12337	12087	5/8	5/8	1-3/8	5
12350	12100	11/16	3/4	1-5/8	5-5/8
12359	12109	3/4	3/4	1-5/8	5-5/8
12377	12127	13/16	7/8	1-7/8	6-1/8
12394	12144	7/8	7/8	1-7/8	6-1/8
12410	12160	15/16	1	1-7/8	6-3/8
12426	12176	1	1	1-7/8	6-3/8

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

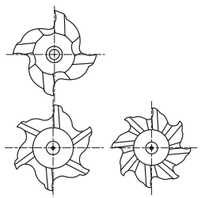
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2031 / E2032** SERIES
HSS (M2) FLAT SHANK **E1031 / E1032** SERIES

HSS Co8 & HSS, 4, 6&8 FLUTE REGULAR LENGTH (3/4 Shank)

▶ E2031(3/4" shank, multi flute, general purpose end mills) are recommended for finishing operations for Bridgeport machines and other similar operations. Easy to regrind.



HSS Co8 | HSS | 4-8 | 30° | FLAT | UNCOATED p.C917, C920

E2031(8% COBALT) , E1031(HSS) Series ■ 4 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
04359	04109	3/4	3/4	1-5/8	3-7/8
04375	04125	13/16	3/4	1-7/8	4-1/8
04391	04141	7/8	3/4	1-7/8	4-1/8
04407	04157	15/16	3/4	1-7/8	4-1/8
04422	04172	1	3/4	1-7/8	4-1/8

E2032(8% COBALT) , E1032(HSS) Series ■ 6&8 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
04432	04182	1-1/8	3/4	2	4-1/4	6
04440	04190	1-1/4	3/4	2	4-1/4	6
04458	04208	1-1/2	3/4	2	4-1/4	6
04468	04218	1-3/4	3/4	2	4-1/2	6
04476	04226	2	3/4	2	4-1/2	8

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2020** SERIES

HSS Co8, 4 FLUTE REGULAR LENGTH BALL NOSE

▶ The four flute ball end mills are designed for milling of radius bottom slots fillets and special contours.
The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut.

HSS Co8 | 4 | 30° | FLAT | UNCOATED p.C923

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	R				
43289	R1/16	**1/8**	3/8	3/8	2-5/16
43293	R3/32	**3/16**	3/8	1/2	2-3/8
43297	R1/8	**1/4**	3/8	5/8	2-7/16
43301	R5/32	**5/16**	3/8	3/4	2-1/2
43305	R3/16	**3/8**	3/8	3/4	2-1/2
43312	R7/32	**7/16**	3/8	1	2-11/16
43321	R1/4	**1/2**	1/2	1-1/4	3-1/4
43337	R5/16	**5/8**	5/8	1-5/8	3-3/4
43350	R11/32	**11/16**	5/8	1-5/8	3-3/4
43359	R3/8	**3/4**	3/4	1-5/8	3-7/8
43394	R7/16	**7/8**	7/8	1-7/8	4-1/8
43426	R1/2	**1**	1	2	4-1/2
43435	R9/16	**1-1/8**	1	2	4-1/2
43445	R5/8	**1-1/4**	1-1/4	2	4-1/2
43461	R3/4	**1-1/2**	1-1/4	2	4-1/2
43477	R1	**2**	1-1/4	2	4-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2021** SERIES

HSS Co8, 4 FLUTE LONG LENGTH BALL NOSE

▶ Longer flute length than E2020 type and suitable for high efficient copying process and deep cutting of die mold corner radius.

HSS Co8 | 4 | 30° | FLAT | UNCOATED p.C923

Unit : Inch

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	R				
44297	R1/8	**1/4**	3/8	1-1/4	3-1/16
44301	R5/32	**5/16**	3/8	1-3/8	3-1/8
44305	R3/16	**3/8**	3/8	1-1/2	3-1/4
44321	R1/4	**1/2**	1/2	2	4
44337	R5/16	**5/8**	5/8	2-1/2	4-5/8
44359	R3/8	**3/4**	3/4	3	5-1/4
44394	R7/16	**7/8**	7/8	3-1/2	5-3/4
44426	R1/2	**1**	1	4	6-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2069** SERIES

HSS Co8, 4 FLUTE REGULAR LENGTH BALL NOSE DOUBLE

▶ Same construction features as E2020 end mill in a more economical version.
Removes more material per grind. Machine ground notch assures positive anchorage in tool holder.

HSS Co8 | 4 | 30° | FLAT | UNCOATED p.C923

Unit : Inch

EDP No. 8% COBALT (M42)	Radius of Ball Nose R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
46289	R1/16	**1/8**	3/8	3/8	3-1/16
46293	R3/32	**3/16**	3/8	1/2	3-1/4
46297	R1/8	**1/4**	3/8	5/8	3-3/8
46301	R5/32	**5/16**	3/8	3/4	3-1/2
46305	R3/16	**3/8**	3/8	3/4	3-1/2
46313	R7/32	**7/16**	1/2	1	4-1/8
46321	R1/4	**1/2**	1/2	1	4-1/8
46337	R5/16	**5/8**	5/8	1-3/8	5
46359	R3/8	**3/4**	3/4	1-5/8	5-5/8
46426	R1/2	**1**	1	1-7/8	6-3/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2039** SERIES
HSS (M2) FLAT SHANK **E1039** SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot.
These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
07289	**07039**	**1/8**	3/8	3/8	2-5/16
07291	**07041**	**5/32**	3/8	7/16	2-3/8
07293	**07043**	**3/16**	3/8	1/2	2-3/8
07295	**07045**	**7/32**	3/8	9/16	2-7/16
07297	**07047**	**1/4**	3/8	5/8	2-7/16
07299	**07049**	**9/32**	3/8	11/16	2-1/2
07301	**07051**	**5/16**	3/8	3/4	2-1/2
07303	**07053**	**11/32**	3/8	3/4	2-1/2
07305	**07055**	**3/8**	3/8	3/4	2-1/2
07308	**07058**	**13/32**	3/8	1	2-11/16
07312	**07062**	**7/16**	3/8	1	2-11/16
07316	**07066**	**15/32**	3/8	1	2-11/16
07320	**07070**	**1/2**	3/8	1	2-11/16
07321	**07071**	**1/2**	1/2	1-1/4	3-1/4

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

▶ NEXT PAGE

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2039** SERIES
HSS (M2) FLAT SHANK **E1039** SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot.
These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
07336	07086	5/8	1/2	1-3/8	3-3/8
07337	07087	5/8	5/8	1-5/8	3-3/4
07348	07098	11/16	5/8	1-5/8	3-3/4
07357	07107	3/4	1/2	1-5/8	3-5/8
07358	07108	3/4	5/8	1-5/8	3-3/4
07359	07109	3/4	3/4	1-5/8	3-7/8
07391	07141	7/8	3/4	1-7/8	4-1/8
07394	07144	7/8	7/8	1-7/8	4-1/8
07420	07170	1	5/8	1-7/8	4
07422	07172	1	3/4	1-7/8	4-1/8
07426	07176	1	1	2	4-1/2
07435	07185	1-1/8	1	2	4-1/2
07445	07195	1-1/4	1-1/4	2	4-1/2
07461	07211	1-1/2	1-1/4	2	4-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

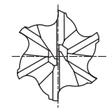
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2042** SERIES
HSS (M2) FLAT SHANK **E1042** SERIES

HSS Co8 & HSS, 6 FLUTE REGULAR LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot.
These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.



HSS Co8 | HSS | 6 | 30° | FLAT | UNCOATED p.C920

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
07322	07072	1/2	1/2	1-1/4	3-1/4
07338	07088	5/8	5/8	1-5/8	3-3/4
07349	07099	11/16	5/8	1-5/8	3-3/4
07360	07110	3/4	3/4	1-5/8	3-7/8
07395	07145	7/8	7/8	1-7/8	4-1/8
07427	07177	1	1	2	4-1/2
07436	07186	1-1/8	1	2	4-1/2
07446	07196	1-1/4	1-1/4	2	4-1/2
07448	-	1-5/16	3/4	2	4-1/4
07462	07212	1-1/2	1-1/4	2	4-1/2
07478	07228	2	1-1/4	2	4-1/2
* 07481	* 07231	2	2	2	5-3/4

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

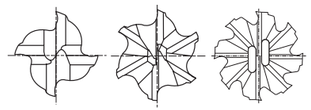
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2039** SERIES
8% COBALT (M42) FLAT SHANK **E2042** SERIES

HSS Co8, MULTI FLUTE MEDIUM LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot.
These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.



HSS Co8 | 4-8 | 30° | FLAT | UNCOATED p.C917, C920

E2039 Series ■ 4 FLUTE, **E2042 Series** ■ 6&8FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
07901	1	1	3	5-1/2	4
07902	1-1/4	1-1/4	3	5-1/2	4
07903	1-1/2	1-1/4	3	5-1/2	4
07094	1	1	3	5-1/2	6
07095	1-1/4	1-1/4	3	5-1/2	6
07096	1-1/2	1-1/4	3	5-1/2	6
07097	1-3/4	1-1/4	3	5-1/2	6
99098	2	1-1/4	3	5-1/2	8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2040 / E2162** SERIES
HSS (M2) FLAT SHANK **E1040 / E1162** SERIES

HSS Co8 & HSS, 4&6 FLUTE LONG LENGTH CENTER CUTTING

▶ Longer flute length than E2039 type, E2042 and allows deeper cutting.

HSS Co8 | HSS | 4&6 | 30° | FLAT | UNCOATED p.C917, C920

E2040(8% COBALT) , E1040(HSS) Series ■ 4 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
08297	08047	1/4	3/8	1-1/4	3-1/16
08301	08051	5/16	3/8	1-3/8	3-1/8
08305	08055	3/8	3/8	1-1/2	3-1/4
08321	08071	1/2	1/2	2	4
08337	08087	5/8	5/8	2-1/2	4-5/8
08359	08109	3/4	3/4	3	5-1/4
08394	08144	7/8	7/8	3-1/2	5-3/4
08426	08176	1	1	4	6-1/2
08445	08195	1-1/4	1-1/4	4	6-1/2
08461	08211	1-1/2	1-1/4	4	6-1/2

E2162(8% COBALT) , E1162(HSS) Series ■ 6 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Lengthe
08322	08072	1/2	1/2	2	4
08338	08088	5/8	5/8	2-1/2	4-5/8
08360	08110	3/4	3/4	3	5-1/4
08395	08145	7/8	7/8	3-1/2	5-3/4
08427	08177	1	1	4	6-1/2
08446	08196	1-1/4	1-1/4	4	6-1/2
08462	08212	1-1/2	1-1/4	4	6-1/2
08478	08228	2	1-1/4	4	6-1/2
* 08485	* 08235	2	2	4	7-3/4
* 08489	* 08239	2	2	6	9-3/4

* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2041 / E2175 SERIES**
HSS (M2) FLAT SHANK **E1041 / E1175 SERIES**

HSS Co8 & HSS, 4&6 FLUTE EXTRA LONG LENGTH CENTER CUTTING

▶ Provided with longest flute length and suitable for high accuracy machining of deep step.

HSS Co8 | HSS | 4&6 | 30° | FLAT | UNCOATED p.C917, C920

E2041(8% COBALT) , E1041(HSS) Series ■ 4 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
09297	09047	1/4	3/8	1-3/4	3-9/16
09301	09051	5/16	3/8	2	3-3/4
09305	09055	3/8	3/8	2-1/2	4-1/4
09321	09071	1/2	1/2	3	5
09337	09087	5/8	5/8	4	6-1/8
09359	09109	3/4	3/4	4	6-1/4
09394	09144	7/8	7/8	5	7-1/4
09426	09176	1	1	6	8-1/2
09445	09195	1-1/4	1-1/4	6	8-1/2

E2175(8% COBALT) , E1175(HSS) Series ■ 6 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Lengthe
09322	09072	1/2	1/2	3	5
09338	09088	5/8	5/8	4	6-1/8
09360	09110	3/4	3/4	4	6-1/4
09395	09145	7/8	7/8	5	7-1/4
09427	09177	1	1	6	8-1/2
09446	09196	1-1/4	1-1/4	6	8-1/2
09462	09212	1-1/2	1-1/4	8	10-1/2
* 09491	* 09241	2	2	8	11-3/4

* Combination Shank

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○											

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2053 SERIES**
HSS (M2) FLAT SHANK **E1053 SERIES**

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE CENTER CUTTING

▶ Series E2053 end mills are the double-end version of E2039 center cutting single-end tools.
They are used for slotting, shallow pocketing, tracer milling or die sinking and similar operation.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
13289	13039	1/8	3/8	3/8	3-1/16
13290	13040	9/64	3/8	7/16	3-1/8
13291	13041	5/32	3/8	7/16	3-1/8
13292	13042	11/64	3/8	1/2	3-1/4
13293	13043	3/16	3/8	1/2	3-1/4
13294	13044	13/64	3/8	9/16	3-1/4
13295	13045	7/32	3/8	9/16	3-1/4
13296	13046	15/64	3/8	5/8	3-3/8
13297	13047	1/4	3/8	5/8	3-3/8
13298	13048	17/64	3/8	11/16	3-3/8
13299	13049	9/32	3/8	11/16	3-3/8
13300	13050	19/64	3/8	3/4	3-1/2
13301	13051	5/16	3/8	3/4	3-1/2
13302	13052	21/64	3/8	3/4	3-1/2
13303	13053	11/32	3/8	3/4	3-1/2
13304	13054	23/64	3/8	3/4	3-1/2
13305	13055	3/8	3/8	3/4	3-1/2
13307	13057	25/64	1/2	1	4-1/8
13309	13059	13/32	1/2	1	4-1/8
13311	13061	27/64	1/2	1	4-1/8
13313	13063	7/16	1/2	1	4-1/8
13315	13065	29/64	1/2	1	4-1/8
13317	13067	15/32	1/2	1	4-1/8

▶ NEXT PAGE

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P													M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○											

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2053** SERIES
HSS (M2) FLAT SHANK **E1053** SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE CENTER CUTTING

▶ Series E2053 end mills are the double-end version of E2039 center cutting single-end tools. They are used for slotting, shallow pocketing, tracer milling or die sinking and similar operation.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED p.C917

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
13319	13069	31/64	1/2	1	4-1/8
13321	13071	1/2	1/2	1	4-1/8
13330	13080	9/16	5/8	1-3/8	5
13337	13087	5/8	5/8	1-3/8	5
13350	13100	11/16	3/4	1-5/8	5-5/8
13359	13109	3/4	3/4	1-5/8	5-5/8
13377	13127	13/16	7/8	1-7/8	6-1/8
13394	13144	7/8	7/8	1-7/8	6-1/8
13426	13176	1	1	1-7/8	6-3/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

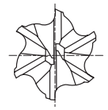
ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2100** SERIES
HSS (M2) FLAT SHANK **E1100** SERIES

HSS Co8 & HSS, 6 FLUTE REGULAR with COMBINATION CENTER CUTTING (2 Shank)

▶ These are to be used for heavy hogging cuts in die-sinking, tape & tracer controlled milling and similar work.
The Heavy-Duty end mills are made with toughened Combination shank, heavy web construction, accurate machine-ground end-teeth notching and a special surface treatment to reduce cutting-edge wear.



HSS Co8 | HSS | 6 | 30° | FLAT | UNCOATED p.C920

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
10481	10231	2	2	2	5-3/4
10485	10235	2	2	4	7-3/4
10487	10237	2	2	5	8-3/4
10489	10239	2	2	6	9-3/4
10491	10241	2	2	8	11-3/4

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)
0~+.0030

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2001** SERIES
HSS (M2) PLAIN SHANK **E1001** SERIES

HSS Co8 & HSS, 2 FLUTE MINIATURE STUB LENGTH DOUBLE

▶Tools under Miniature end mills have 3/16″ shank diameter without flats. They are designed with positive rake angle geometry and a high helix angle to insure free cutting action. The flute design provides good strength behind the cutting edge. Suitable for finishing of precision components such as watch, camera, electronic apparatus molds, etc.

HSS Co8 | HSS | 2 | 39° | 30° | PLAIN | UNCOATED | p.C926

~Ø3/32 Ø7/64~

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
49252	49002	1/32	3/16	3/64	2
49254	49004	3/64	3/16	1/16	2
49256	49006	1/16	3/16	3/32	2
49258	49008	5/64	3/16	1/8	2
49260	49010	3/32	3/16	9/64	2
49262	49012	7/64	3/16	5/32	2
49264	49014	1/8	3/16	3/16	2
49266	49016	9/64	3/16	7/32	2
49268	49018	5/32	3/16	15/64	2
49270	49020	11/64	3/16	1/4	2
49272	49022	3/16	3/16	9/32	2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

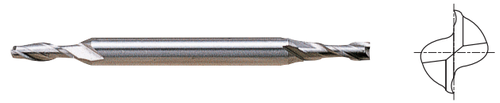
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2003** SERIES
HSS (M2) PLAIN SHANK **E1003** SERIES

HSS Co8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.



HSS Co8 | HSS | 2 | 39° | 30° | PLAIN | UNCOATED | p.C926

~Ø3/32 Ø7/64~

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
50252	50002	1/32	3/16	3/32	2-1/4
50254	50004	3/64	3/16	9/64	2-1/4
50256	50006	1/16	3/16	3/16	2-1/4
50258	50008	5/64	3/16	15/64	2-1/4
50260	50010	3/32	3/16	9/32	2-1/4
50262	50012	7/64	3/16	21/64	2-1/4
50264	50014	1/8	3/16	3/8	2-1/4
50266	50016	9/64	3/16	13/32	2-1/4
50268	50018	5/32	3/16	7/16	2-1/4
50270	50020	11/64	3/16	1/2	2-1/4
50272	50022	3/16	3/16	1/2	2-1/4

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

YG COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2005** SERIES
HSS (M2) PLAIN SHANK **E1005** SERIES

HSS Co8 & HSS, 2 FLUTE MINIATURE LONG LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.

HSS Co8 | HSS | 2 | 39° | 30° | PLAIN | UNCOATED

~Ø3/32 Ø7/64~

p.C926

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
51256	51006	1/16	3/16	7/32	2-1/2
51258	51008	5/64	3/16	1/4	2-1/2
51260	51010	3/32	3/16	9/32	2-5/8
51262	51012	7/64	3/16	9/32	2-5/8
51264	51014	1/8	3/16	3/4	3-1/8
51266	51016	9/64	3/16	3/4	3-1/8
51268	51018	5/32	3/16	7/8	3-1/4
51270	51020	11/64	3/16	7/8	3-1/4
51272	51022	3/16	3/16	1	3-3/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

YG COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2002** SERIES
HSS (M2) PLAIN SHANK **E1002** SERIES

HSS Co8 & HSS, 4FLUTE MINIATURE STUB LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.

HSS Co8 | HSS | 4 | 39° | 30° | PLAIN | UNCOATED

~Ø3/32 Ø7/64~

p.C926

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
52256	52006	1/16	3/16	3/32	2
52258	52008	5/64	3/16	1/8	2
52260	52010	3/32	3/16	9/64	2
52262	52012	7/64	3/16	5/32	2
52264	52014	1/8	3/16	3/16	2
52266	52016	9/64	3/16	7/32	2
52268	52018	5/32	3/16	15/64	2
52270	52020	11/64	3/16	1/4	2
52272	52022	3/16	3/16	9/32	2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2004** SERIES
HSS (M2) PLAIN SHANK **E1004** SERIES

HSS Co8 & HSS, 4FLUTE MINIATURE REGULAR LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.

HSS Co8 | HSS | 4 | 39° ~Ø3/32 | 30° Ø7/64~ | PLAIN | UNCOATED p.C926

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
53256	53006	1/16	3/16	3/16	2-1/4
53258	53008	5/64	3/16	15/64	2-1/4
53260	53010	3/32	3/16	9/32	2-1/4
53262	53012	7/64	3/16	21/64	2-1/4
53264	53014	1/8	3/16	3/8	2-1/4
53266	53016	9/64	3/16	13/32	2-1/4
53268	53018	5/32	3/16	7/16	2-1/4
53270	53020	11/64	3/16	1/2	2-1/4
53272	53022	3/16	3/16	1/2	2-1/4

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2006** SERIES
HSS (M2) PLAIN SHANK **E1006** SERIES

HSS Co8 & HSS, 4FLUTE MINIATURE LONG LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.

HSS Co8 | HSS | 4 | 39° ~Ø3/32 | 30° Ø7/64~ | PLAIN | UNCOATED p.C926

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
54256	54006	1/16	3/16	7/32	2-1/2
54258	54008	5/64	3/16	1/4	2-1/2
54260	54010	3/32	3/16	9/32	2-5/8
54262	54012	7/64	3/16	9/32	2-5/8
54264	54014	1/8	3/16	3/4	3-1/8
54266	54016	9/64	3/16	3/4	3-1/8
54268	54018	5/32	3/16	7/8	3-1/4
54270	54020	11/64	3/16	7/8	3-1/4
54272	54022	3/16	3/16	1	3-3/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2008** SERIES
HSS (M2) PLAIN SHANK **E1008** SERIES

HSS Co8 & HSS, 2 FLUTE MINIATURE STUB LENGTH BALL NOSE DOUBLE

▶ Helical flute in the nose radius.
Suitable for high efficient copying process and cutting of die mold corner radius.

HSS Co8 | HSS | 2 | 39° ~Ø3/32 | 30° Ø7/64~ | PLAIN | UNCOATED p.C926

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)	R				
55256	**55006**	R1/32	**1/16**	3/16	3/32	2
55260	**55010**	R3/64	**3/32**	3/16	9/64	2
55264	**55014**	R1/16	**1/8**	3/16	3/16	2
55268	**55018**	R5/64	**5/32**	3/16	15/64	2
55272	**55022**	R3/32	**3/16**	3/16	9/32	2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M					K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2013** SERIES
HSS (M2) PLAIN SHANK **E1013** SERIES

HSS Co8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH BALL NOSE DOUBLE

▶ Helical flute in the nose radius.
Suitable for high efficient copying process and cutting of die mold corner radius.

HSS Co8 | HSS | 2 | 39° ~Ø3/32 | 30° Ø7/64~ | PLAIN | UNCOATED p.C926

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)	R				
56252	**56002**	R1/64	**1/32**	3/16	3/32	2-1/4
56254	**56004**	R3/128	**3/64**	3/16	9/64	2-1/4
56256	**56006**	R1/32	**1/16**	3/16	3/16	2-1/4
56258	**56008**	R5/128	**5/64**	3/16	15/64	2-1/4
56260	**56010**	R3/64	**3/32**	3/16	9/32	2-1/4
56262	**56012**	R7/128	**7/64**	3/16	21/64	2-1/4
56264	**56014**	R1/16	**1/8**	3/16	3/8	2-1/4
56266	**56016**	R9/128	**9/64**	3/16	13/32	2-1/4
56268	**56018**	R5/64	**5/32**	3/16	7/16	2-1/4
56270	**56020**	R11/128	**11/64**	3/16	1/2	2-1/4
56272	**56022**	R3/32	**3/16**	3/16	1/2	2-1/4

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M					K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

COBALT & HSS END MILLS

8% COBALT (M42) PLAIN SHANK **E2015** SERIES
HSS (M2) PLAIN SHANK **E1015** SERIES

HSS Co8 & HSS, 2 FLUTE MINIATURE LONG LENGTH BALL NOSE DOUBLE

▶ Helical flute in the nose radius.
Suitable for high efficient copying process and cutting of die mold corner radius.

HSS Co8 | HSS | 2 | 39° | 30° | PLAIN | UNCOATED

~Ø3/32 Ø7/64~

p.C926

Unit : Inch

EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
8% COBALT (M42)	HSS (M2)	R				
57256	**57006**	R1/32	**1/16**	3/16	7/32	2-1/2
57260	**57010**	R3/64	**3/32**	3/16	9/32	2-5/8
57264	**57014**	R1/16	**1/8**	3/16	3/4	3-1/8
57268	**57018**	R5/64	**5/32**	3/16	7/8	3-1/4
57272	**57022**	R3/32	**3/16**	3/16	1	3-3/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~ -.0020

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M					K			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○	○	○	○						

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○		○						○	○				

COBALT & HSS END MILLS

HSS (M2) FLAT SHANK **E1070** SERIES

HSS, 2 FLUTE 42° HELIX REGULAR & MEDIUM LENGTH for ALUMINUM

▶ The two flute end mills for aluminum have High Helix flute design making them well suited for milling aluminum and other non-ferrous materials. Special rake angles and low micro inch finishes on the primary clearance angles and flute faces insure free cutting action, fine finishes and longer tool life for both non-ferrous materials as well as harder alloys. These tools are made from regular HSS(M2), which is good for aluminum cutting.

HSS | 2 | 42° | FLAT | UNCOATED

p.C906

■ REGULAR LENGTH

Unit : Inch

EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
17047	**1/4**	3/8	5/8	2-7/16
17051	**5/16**	3/8	3/4	2-1/2
17055	**3/8**	3/8	3/4	2-1/2
17062	**7/16**	3/8	1	2-11/16
17071	**1/2**	1/2	1-1/4	3-1/4
17087	**5/8**	5/8	1-5/8	3-3/4
17109	**3/4**	3/4	1-5/8	3-7/8
17141	**7/8**	3/4	1-7/8	4-1/8
17144	**7/8**	7/8	1-7/8	4-1/8
17172	**1**	3/4	1-7/8	4-1/8
17176	**1**	1	2	4-1/2
17195	**1-1/4**	1-1/4	2	4-1/2
17211	**1-1/2**	1-1/4	2	4-1/2
17219	**1-3/4**	1-1/4	2	4-1/2
17227	**2**	1-1/4	2	4-1/2

■ MEDIUM LENGTH

Unit : Inch

EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
99089	**1**	1	3	5-1/2
99090	**1-1/4**	1-1/4	3	5-1/2
99091	**1-1/2**	1-1/4	3	5-1/2
99092	**1-3/4**	1-1/4	3	5-1/2
99093	**2**	1-1/4	3	5-1/2

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M					K			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○				○				○										

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

YG COBALT & HSS END MILLS

HSS (M2) FLAT SHANK **E1071** SERIES
HSS (M2) FLAT SHANK **E1072** SERIES

HSS, 2 FLUTE 42° HELIX LONG & EXTRA LONG LENGTH for ALUMINUM

▶ Sharp cutting most suitable flute shape for cutting aluminum alloy, etc.
These tools are made from regular HSS(M2), which is good for aluminum cutting.

HSS | 2 | 42° | FLAT | UNCOATED p.C906

■ LONG LENGTH

Unit : Inch

EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
18047	1/4	3/8	1-1/4	3-1/16
18051	5/16	3/8	1-3/8	3-1/8
18055	3/8	3/8	1-1/2	3-1/4
18063	7/16	1/2	1-3/4	3-3/4
18071	1/2	1/2	2	4
18087	5/8	5/8	2-1/2	4-5/8
18109	3/4	3/4	3	5-1/4
18176	1	1	4	6-1/2
18195	1-1/4	1-1/4	4	6-1/2
18211	1-1/2	1-1/4	4	6-1/2
18227	2	1-1/4	4	6-1/2

■ EXTRA LONG LENGTH

Unit : Inch

EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
19047	1/4	3/8	1-3/4	3-9/16
19051	5/16	3/8	2	3-3/4
19055	3/8	3/8	2-1/2	4-1/4
19071	1/2	1/2	3	5
19087	5/8	5/8	4	6-1/8
19109	3/4	3/4	4	6-1/4
19176	1	1	6	8-1/2
19195	1-1/4	1-1/4	6	8-1/2
19211	1-1/2	1-1/4	8	10-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	○	○				○				○										

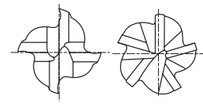
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎																

YG COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2086** SERIES

HSS Co8, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.



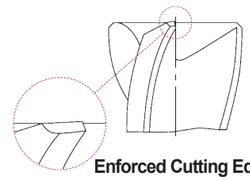
HSS Co8 | FINE | 4&5 | 30° | FLAT | UNCOATED p.C927

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
75297	1/4	3/8	1/4	2-1/16	4
75305	3/8	3/8	3/8	2-5/32	4
75313	7/16	1/2	1/2	2-1/2	4
75321	1/2	1/2	1/2	2-1/2	4
75337	5/8	5/8	5/8	2-3/4	4
75359	3/4	3/4	3/4	2-7/8	4
75391	7/8	3/4	7/8	3-1/8	5
75426	1	1	1	3-1/2	5

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

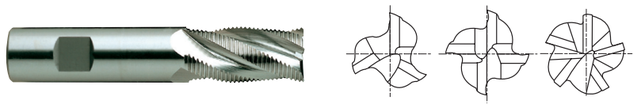
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2085** SERIES

HSS Co8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.



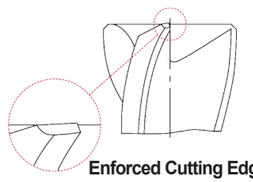
HSS Co8 | FINE | 3-5 | 30° | FLAT | UNCOATED p.C927

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
76297	1/4	3/8	5/8	2-7/16	3
76301	5/16	3/8	3/4	2-1/2	3
76305	3/8	3/8	3/4	2-1/2	4
76312	7/16	3/8	1	2-11/16	4
76321	1/2	1/2	1-1/4	3-1/4	4
76328	9/16	1/2	1-3/8	3-3/8	4
76337	5/8	5/8	1-5/8	3-3/4	4
76359	3/4	3/4	1-5/8	3-7/8	4
76391	7/8	3/4	1-7/8	4-1/8	5
76394	7/8	7/8	1-7/8	4-1/8	5
76422	1	3/4	2	4-1/4	5
76426	1	1	2	4-1/2	5

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

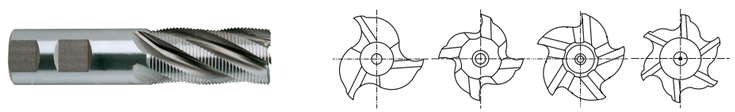
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2079** SERIES

HSS Co8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

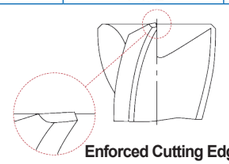


HSS Co8 | FINE | 3-6 | 30° | FLAT | UNCOATED p.C927

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
70297	1/4	3/8	5/8	2-7/16	3
70301	5/16	3/8	3/4	2-1/2	3
70305	3/8	3/8	3/4	2-1/2	4
70312	7/16	3/8	1	2-11/16	4
70321	1/2	1/2	1-1/4	3-1/4	4
70328	9/16	1/2	1-3/8	3-3/8	4
70337	5/8	5/8	1-5/8	3-3/4	4
70358	3/4	5/8	1-5/8	3-3/4	4
70359	3/4	3/4	1-5/8	3-7/8	4
70391	7/8	3/4	1-7/8	4-1/8	5
70394	7/8	7/8	1-7/8	4-1/8	5
70422	1	3/4	2	4-1/4	5
70426	1	1	2	4-1/2	5
70431	1-1/8	3/4	2	4-1/4	6
70435	1-1/8	1	2	4-1/2	6
70439	1-1/4	3/4	2	4-1/4	6
70445	1-1/4	1-1/4	2	4-1/2	6
70449	1-3/8	3/4	2	4-1/4	6
70457	1-1/2	3/4	2	4-1/4	6
70461	1-1/2	1-1/4	2	4-1/2	6
70469	1-3/4	1-1/4	2	4-1/2	6
70475	2	3/4	2	4-1/4	6
70477	2	1-1/4	2	4-1/2	6

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

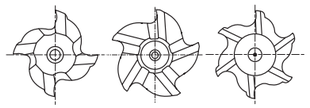
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2077** SERIES

HSS Co8, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

▶This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.



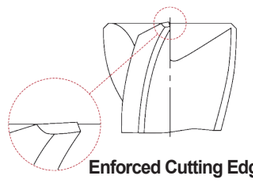
HSS Co8 | FINE | 4-6 | 30° | FLAT | UNCOATED p.C927

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
71321	1/2	1/2	2	4	4
71337	5/8	5/8	2-1/2	4-5/8	4
71358	3/4	5/8	3	5-1/4	4
71359	3/4	3/4	3	5-1/4	4
71394	7/8	7/8	3-1/2	5-3/4	5
71426	1	1	4	6-1/2	5
71445	1-1/4	1-1/4	4	6-1/2	6
71457	1-1/2	3/4	4	6-1/4	6
71461	1-1/2	1-1/4	4	6-1/2	6
71469	1-3/4	1-1/4	4	6-1/2	6
71477	2	1-1/4	4	6-1/2	6

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2086** SERIES

HSS Co8, 3 FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING

▶This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

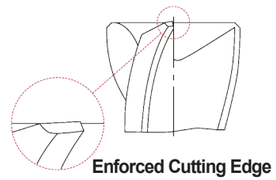
HSS Co8 | FINE | 3 | 30° | FLAT | UNCOATED p.C927

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
72297	1/4	3/8	1/4	2-1/16
72305	3/8	3/8	3/8	2-5/32
72321	1/2	1/2	1/2	2-1/2
72337	5/8	5/8	5/8	2-3/4
72359	3/4	3/4	3/4	2-7/8
72391	7/8	3/4	7/8	3-1/8
72422	1	3/4	1	3-1/4
72426	1	1	1	3-1/2

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P																			
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

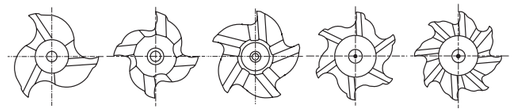
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2170** SERIES

HSS Co8, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.The end tooth of this tool has a center hole design for many accurate resharpenings between centers.



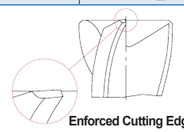
HSS Co8 | COARSE | 3-8 | 30° | FLAT | UNCOATED p.C927

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
60297	1/4	3/8	5/8	2-7/16	3
60301	5/16	3/8	3/4	2-1/2	3
60305	3/8	3/8	3/4	2-1/2	4
60312	7/16	3/8	1	2-11/16	4
60321	1/2	1/2	1-1/4	3-1/4	4
60328	9/16	1/2	1-3/8	3-3/8	4
60337	5/8	5/8	1-5/8	3-3/4	4
60348	11/16	5/8	1-5/8	3-3/4	4
60358	3/4	5/8	1-5/8	3-3/4	4
60359	3/4	3/4	1-5/8	3-3/4	4
60375	13/16	3/4	1-7/8	4-1/8	4
60391	7/8	3/4	1-7/8	4-1/8	5
60394	7/8	7/8	1-7/8	4-1/8	5
60409	15/16	7/8	1-7/8	4-1/8	5
60422	1	3/4	2	4-1/4	5
60426	1	1	2	4-1/2	5
60431	1-1/8	3/4	2	4-1/4	6
60435	1-1/8	1	2	4-1/2	6
60439	1-1/4	3/4	2	4-1/4	6
60445	1-1/4	1-1/4	2	4-1/2	6
60449	1-3/8	3/4	2	4-1/4	6
60457	1-1/2	3/4	2	4-1/4	6
60461	1-1/2	1-1/4	2	4-1/2	6
60467	1-3/4	3/4	2	4-1/4	6
60469	1-3/4	1-1/4	2	4-1/2	6
60475	2	3/4	2	4-1/4	6
60477	2	1-1/4	2	4-1/2	6
* 60480	2	2	2	5-3/4	8
* 60482	2	2	3	6-3/4	8
* 60484	2	2	4	7-3/4	8

* Combination Shank

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

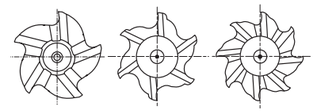
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2171** SERIES

HSS Co8, MULTI FLUTE MEDIUM LENGTH COARSE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.



HSS Co8 | COARSE | 5-8 | 30° | FLAT | UNCOATED p.C927

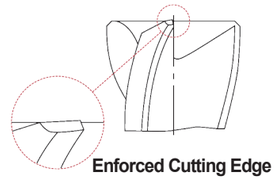
Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
61426	1	1	3	5-1/2	5
61445	1-1/4	1-1/4	3	5-1/2	6
61461	1-1/2	1-1/4	3	5-1/2	6
* 61488	2	2	6	9-3/4	8

* Combination Shank

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

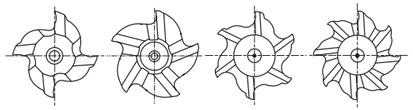
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2172** SERIES

HSS Co8, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.



HSS Co8 | COARSE | 4-8 | 30° | FLAT | UNCOATED p.C927

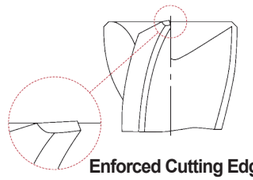
Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
62321	1/2	1/2	2	4	4
62337	5/8	5/8	2-1/2	4-5/8	4
62358	3/4	5/8	3	5-1/8	4
62359	3/4	3/4	3	5-1/4	4
62391	7/8	3/4	3-1/2	5-3/4	5
62422	1	3/4	4	6-1/4	5
62426	1	1	4	6-1/2	5
62439	1-1/4	3/4	4	6-1/4	6
62445	1-1/4	1-1/4	4	6-1/2	6
62457	1-1/2	3/4	4	6-1/4	6
62461	1-1/2	1-1/4	4	6-1/2	6
62469	1-3/4	1-1/4	4	6-1/2	6
62477	2	1-1/4	4	6-1/2	6
* 62490	2	2	8	11-3/4	8

* Combination Shank

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2241** SERIES

HSS Co8, 3FLUTE STUB LENGTH COARSE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.

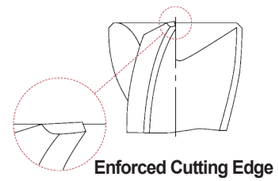
HSS Co8 | COARSE | 3 | 30° | FLAT | UNCOATED p.C927

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
63297	1/4	3/8	1/4	2-1/16
63305	3/8	3/8	3/8	2-5/32
63321	1/2	1/2	1/2	2-1/2
63337	5/8	5/8	5/8	2-3/4
63359	3/4	3/4	3/4	2-7/8
63426	1	1	1	3-1/2

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

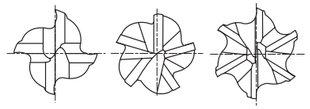
COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2195 SERIES**

8% COBALT (M42) FLAT SHANK **E2197 SERIES**

HSS Co8, MULTI FLUTE REGULAR & LONG LENGTH COARSE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.



HSS Co8 | COARSE | 4-6 | 30° | FLAT | UNCOATED p.C927

E2195 Series ■ REGULAR LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
64321	1/2	1/2	1-1/4	3-1/4	4
64337	5/8	5/8	1-5/8	3-3/4	4
64359	3/4	3/4	1-5/8	3-7/8	4
64426	1	1	2	4-1/2	5
64445	1-1/4	1-1/4	2	4-1/2	6
64461	1-1/2	1-1/4	2	4-1/2	6

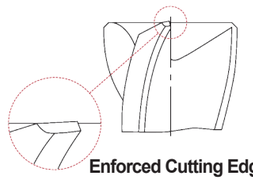
E2197 Series ■ LONG LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
65321	1/2	1/2	2	4	4
65337	5/8	5/8	2-1/2	4-5/8	4
65359	3/4	3/4	3	5-1/4	4
65426	1	1	4	6-1/2	5
65445	1-1/4	1-1/4	4	6-1/2	6
65461	1-1/2	1-1/4	4	6-1/2	6

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2193 SERIES**

8% COBALT (M42) FLAT SHANK **E2125 SERIES**

HSS Co8, MULTI FLUTE REGULAR & LONG LENGTH COARSE PITCH ROUGHING BALL NOSE

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.

HSS Co8 | COARSE | 3-6 | 30° | FLAT | UNCOATED p.C930

E2193 Series ■ REGULAR LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Radius of Ball Nose R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
68297	R1/8	1/4	3/8	5/8	2-7/16	3
68301	R5/32	5/16	3/8	3/4	2-1/2	3
68305	R3/16	3/8	3/8	3/4	2-1/2	4
68321	R1/4	1/2	1/2	1-1/4	3-1/4	4
68337	R5/16	5/8	5/8	1-5/8	3-3/4	4
68359	R3/8	3/4	3/4	1-3/4	4	4
68422	R1/2	1	3/4	2	4-1/2	5
68426	R1/2	1	1	2	4-1/2	5
68439	R5/8	1-1/4	3/4	2	4-1/2	6
68445	R5/8	1-1/4	1-1/4	2	4-1/2	6
68457	R3/4	1-1/2	3/4	2	4-1/2	6
68461	R3/4	1-1/2	1-1/4	2	4-1/2	6

E2125 Series ■ LONG LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Radius of Ball Nose R	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
69321	R1/4	1/2	1/2	2-1/2	4-1/2	4
69337	R5/16	5/8	5/8	2-1/2	4-5/8	4
69359	R3/8	3/4	3/4	3	5-1/4	4
69426	R1/2	1	1	4	6-1/2	5
69445	R5/8	1-1/4	1-1/4	4	6-1/2	6
69461	R3/4	1-1/2	1-1/4	4	6-1/2	6

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

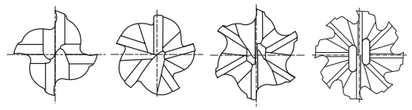
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2248** SERIES

HSS Co8, MULTI FLUTE REGULAR LENGTH ROUGHING & FINISHING

▶This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.



HSS Co8 | NF | 4-8 | 30° | FLAT | UNCOATED p.C931

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length	No.of Flute
73297	1/4	3/8	5/8	2-7/16	4
73301	5/16	3/8	3/4	2-1/2	4
73305	3/8	3/8	3/4	2-1/2	4
73312	7/16	3/8	1	2-11/16	4
73321	1/2	1/2	1-1/4	3-1/4	4
73328	9/16	1/2	1-3/8	3-3/8	4
73337	5/8	5/8	1-5/8	3-3/4	4
73348	11/16	5/8	1-5/8	3-3/4	4
73358	3/4	5/8	1-5/8	3-3/4	4
73359	3/4	3/4	1-5/8	3-3/4	4
73391	7/8	3/4	1-7/8	4-1/8	5
73394	7/8	7/8	1-7/8	4-1/8	5
73422	1	3/4	2	4-1/4	5
73426	1	1	2	4-1/2	5
73431	1-1/8	3/4	2	4-1/4	6
73435	1-1/8	1	2	4-1/2	6
73439	1-1/4	3/4	2	4-1/4	6
73445	1-1/4	1-1/4	2	4-1/2	6
73457	1-1/2	3/4	2	4-1/4	6
73461	1-1/2	1-1/4	2	4-1/2	6
73467	1-3/4	3/4	2	4-1/4	6
73469	1-3/4	1-1/4	2	4-1/2	6
73475	2	3/4	2	4-1/4	6
73477	2	1-1/4	2	4-1/2	6
* 73480	2	2	2	5-3/4	8
* 73482	2	2	3	6-3/4	8
* 73484	2	2	4	7-3/4	8

* Combination Shank

Mill Dia. Tolerance (inch)
+ .0025 + .0005

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2191** SERIES

HSS Co8, 3 FLUTE 37° HELIX REGULAR LENGTH ROUGHING for ALUMINUM

▶This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.

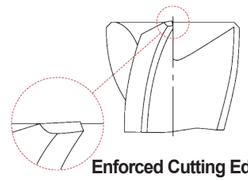
HSS Co8 | ALU | 3 | 37° | FLAT | UNCOATED p.C932

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
66297	1/4	3/8	5/8	2-7/16
66301	5/16	3/8	3/4	2-1/2
66305	3/8	3/8	3/4	2-1/2
66321	1/2	1/2	1-1/4	3-1/4
66337	5/8	5/8	1-5/8	3-3/4
66359	3/4	3/4	1-5/8	3-7/8
66391	7/8	3/4	1-7/8	4-1/8
66426	1	1	2	4-1/2
66445	1-1/4	1-1/4	2	4-1/2
66461	1-1/2	1-1/4	2	4-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P										M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel				Stainless steel			Grey cast iron		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2226 SERIES**

8% COBALT (M42) FLAT SHANK **E2192 SERIES**

HSS Co8, 3 FLUTE 37° HELIX MEDIUM & LONG LENGTH ROUGHING for ALUMINUM

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting aluminum, aluminum alloy and many non-ferrous materials.

HSS Co8 | ALU | 3 | 37° | FLAT | UNCOATED p.C932

E2226 Series ■ MEDIUM LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
66901	1	1	3	5-1/2
66902	1-1/4	1-1/4	3	5-1/2

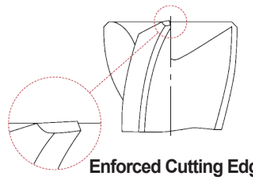
E2192 Series ■ LONG LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
67321	1/2	1/2	2	4
67337	5/8	5/8	2-1/2	4-5/8
67359	3/4	3/4	3	5-1/4
67426	1	1	4	6-1/2
67445	1-1/4	1-1/4	4	6-1/2
67461	1-1/2	1-1/4	4	6-1/2

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
up to 1	0~+.0030
over 1	0~+.0060



Enforced Cutting Edge

◎ : Excellent ○ : Good

ISO	P											M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend	◎	◎	◎	◎	◎	○	○	○													

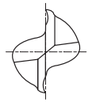
COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2163 SERIES**

HSS (M2) FLAT SHANK **E1163 SERIES**

HSS Co8 & HSS, 2 FLUTE 15° HELIX for KEYWAY CUTTING

▶ E2163(E1163) are keyway cutting end mills that have the same design as the general purpose of two flute single end mill, but are held to a mill diameter tolerance of +.0000 -.0015. These close tolerance end mills are recommended for cutting keyway which must be held close to nominal size.



HSS Co8 | HSS | 2 | 15° | FLAT | UNCOATED p.C903

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
14289	14039	1/8	3/8	3/8	2-5/16
14293	14043	3/16	3/8	7/16	2-5/16
14297	14047	1/4	3/8	1/2	2-5/16
14301	14051	5/16	3/8	9/16	2-5/16
14305	14055	3/8	3/8	9/16	2-5/16
14312	14062	7/16	3/8	13/16	2-1/2
14321	14071	1/2	1/2	1	3
14337	14087	5/8	5/8	1-5/16	3-7/16
14359	14109	3/4	3/4	1-5/16	3-9/16
14394	14144	7/8	7/8	1-1/2	3-3/4
14426	14176	1	1	1-5/8	4-1/8

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)
0~-.0015

◎ : Excellent ○ : Good

ISO	P											M			K				
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

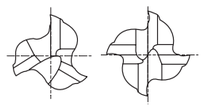
ISO	N										S						H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2120** SERIES
HSS (M2) FLAT SHANK **E2121** SERIES

HSS Co8, 3&4 FLUTE 60° HELIX REGULAR LENGTH

▶ Provided with high helix angle(60°).
Smooth cutting and small cutting resistance.
Suitable for machining of difficult-to-cut materials.



HSS Co8 | 3&4 | 60° | FLAT | UNCOATED p.C913

E2120 Series ■ 3 FLUTE

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
20297	1/4	3/8	5/8	2-7/16
20301	5/16	3/8	3/4	2-1/2
20305	3/8	3/8	3/4	2-1/2
20312	7/16	3/8	1	2-11/16
20321	1/2	1/2	1-1/4	3-1/4
20337	5/8	5/8	1-5/8	3-3/4
20359	3/4	3/4	1-5/8	3-7/8

E2121 Series ■ 4 FLUTE

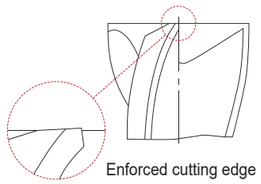
Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
20394	7/8	7/8	1-7/8	4-1/8
20426	1	1	2	4-1/2
20445	1-1/4	1-1/4	2	4-1/2
20461	1-1/2	1-1/4	2	4-1/2
20477	2	1-1/4	2	4-1/2

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.



Enforced cutting edge

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommend	◎	◎	◎	◎	○	◎	◎	○	○	◎		○	○	○	○	○	○	○	○	○

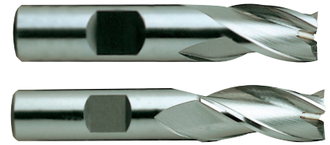
ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommend																					

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2160** SERIES
HSS (M2) FLAT SHANK **E2161** SERIES

HSS Co8, 3 FLUTE SHORT & LONG LENGTH THROW AWAY

▶ Well balanced web design to minimize deflection & chattering. High accuracy for O.D. is guaranteed under the strict tolerance control.
Much higher(50%) table speed than 2 Flute is allowed.



HSS Co8 | 3 | 30° | FLAT | UNCOATED p.C907

E2160 Series ■ SHORT LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
22257	1/16	1/4	3/32	31/32
22261	3/32	1/4	5/32	1-1/64
22265	1/8	1/4	3/16	1-3/32
22269	5/32	1/4	1/4	1-9/32
22273	3/16	1/4	9/32	1-11/32
22277	7/32	1/4	5/16	1-13/32
22281	1/4	1/4	3/8	1-13/32

E2161 Series ■ LONG LENGTH

Unit : Inch

EDP No. 8% COBALT (M42)	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
23257	1/16	1/4	5/32	1-3/32
23261	3/32	1/4	1/4	1-1/4
23265	1/8	1/4	5/16	1-11/32
23269	5/32	1/4	3/8	1-17/32
23273	3/16	1/4	7/16	1-21/32
23277	7/32	1/4	1/2	1-3/4
23281	1/4	1/4	5/8	1-3/4

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

Mill Dia. Tolerance (inch)
- .0005 - .0013

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2237** SERIES
HSS (M2) FLAT SHANK **E1237** SERIES

HSS Co8 & HSS, 4 FLUTE CORNER ROUNDING

▶This general corner rounding end mills are designed for machining fillets on work piece.

HSS Co8 | HSS | 4 | FLAT | UNCOATED

p.C933

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Radius	Pilot Diameter	Outside Diameter	Shank Diameter	Overall Length
29251	29001	1/16	1/4	7/16	3/8	2-1/2
29252	29002	3/32	1/4	1/2	3/8	2-1/2
29253	29003	1/8	1/4	5/8	1/2	3
29254	29004	5/32	5/16	3/4	1/2	3
29255	29005	3/16	3/8	7/8	1/2	3
29256	29006	3/16	3/8	7/8	3/4	3-1/8
29257	29007	7/32	5/16	7/8	1/2	3-1/4
29258	29008	1/4	3/8	1	1/2	3
29259	29009	9/32	3/8	1	5/8	3
29260	29010	1/4	3/8	1	3/4	3-1/4
29261	29011	5/16	3/8	1-1/8	1/2	3-1/4
29262	29012	5/16	3/8	1-1/8	5/8	3-1/2
29263	29013	5/16	3/8	1-1/8	3/4	3-1/2
29264	29014	5/16	3/8	1-1/8	7/8	3-1/2
29265	29015	3/8	3/8	1-1/4	1/2	3-1/2
29266	29016	3/8	3/8	1-1/4	3/4	3-3/4
29267	29017	3/8	3/8	1-1/4	7/8	3-3/4
29268	29018	7/16	3/8	1-3/8	3/4	3-3/4
29269	29019	7/16	3/8	1-3/8	1	4
29270	29020	1/2	3/8	1-1/2	3/4	3-7/8
29271	29021	1/2	3/8	1-1/2	1	4-1/8
29272	29022	5/8	5/16	1-5/8	3/4	4
29273	29023	5/8	5/16	1-5/8	1	4
29274	29024	5/8	9/16	1-15/16	3/4	4
29275	29025	5/8	9/16	1-15/16	1	4-1/4
29276	29026	3/4	5/16	1-7/8	3/4	4
29277	29027	3/4	5/16	1-7/8	1	4
29278	29028	3/4	5/8	2-1/4	3/4	4-1/8
29279	29029	3/4	5/8	2-1/4	1	4-5/16
29280	29030	7/8	5/8	2-1/2	3/4	4-1/2
29281	29031	1	5/8	2-5/8	3/4	4-1/2
29282	29032	1	5/8	2-3/4	1	4-3/4

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

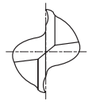
ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2482** SERIES
HSS (M2) FLAT SHANK **E1482** SERIES

HSS Co8 & HSS, 2 FLUTE REGULAR LENGTH

▶Two flute end mills with metric cutting diameter are especially recommended for slotting operation, pocketing keyway cutting and other general purpose work including plunge cutting.



HSS Co8 | HSS | 2 | 30° | FLAT | UNCOATED

p.C934

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
15252	15002	2.0	.0787	3/8	5/16	2-5/16
15253	15003	2.5	.0984	3/8	5/16	2-5/16
15254	15004	3.0	.1181	3/8	5/16	2-5/16
15255	15005	3.5	.1378	3/8	7/16	2-5/16
15256	15006	4.0	.1575	3/8	7/16	2-5/16
15257	15007	4.5	.1772	3/8	1/2	2-5/16
15258	15008	5.0	.1969	3/8	1/2	2-5/16
15259	15009	5.5	.2165	3/8	1/2	2-5/16
15260	15010	6.0	.2362	3/8	1/2	2-5/16
15261	15011	7.0	.2756	3/8	9/16	2-5/16
15262	15012	8.0	.3150	3/8	9/16	2-5/16
15263	15013	9.0	.3543	3/8	9/16	2-5/16
15264	15014	10.0	.3937	3/8	13/16	2-1/2
15265	15015	11.0	.4330	3/8	13/16	2-1/2
15266	15016	12.0	.4724	3/8	13/16	2-1/2
15267	15017	12.5	.4921	1/2	1-1/8	3-1/8
15268	15018	13.0	.5118	1/2	1-1/8	3-1/8
15270	15020	14.0	.5512	1/2	1-1/8	3-1/8
15276	15026	16.0	.6299	5/8	1-5/16	3-7/16
15280	15030	18.0	.7087	5/8	1-5/16	3-7/16
15282	15032	20.0	.7874	5/8	1-1/2	3-3/4
15284	15034	22.0	.8661	3/4	1-1/2	3-3/4
15288	15038	24.0	.9449	3/4	2	4-1/2
15290	15040	25.0	.9843	1	2	4-1/2
15296	15046	32.0	1.2598	1	2	4-1/2
15298	15048	36.0	1.4173	1	2	4-1/2
15300	15050	40.0	1.5748	1-1/4	2	4-1/2
15302	15052	45.0	1.7717	1-1/4	2	4-1/2

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S							H		
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Chilled Cast Iron	Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

8% COBALT (M42) FLAT SHANK **E2483** SERIES
HSS (M2) FLAT SHANK **E1483** SERIES

HSS Co8 & HSS, 4 FLUTE REGULAR LENGTH

▶ E2483 have an extensive range of standard regular length in metric diameter.
End mills with center cutting are recommended for a wide range of cutting jobs, including slotting, shallow pocketing and tracer milling.

HSS Co8 | HSS | 4 | 30° | FLAT | UNCOATED

p.C935

Unit : Inch

EDP No. 8% COBALT (M42)	EDP No. HSS (M2)	Mill Diameter Metric	Mill Diameter Inch	Shank Diameter	Length of Cut	Overall Length
16252	16002	2.0	.0787	3/8	3/8	2-5/16
16253	16003	2.5	.0984	3/8	3/8	2-5/16
16254	16004	3.0	.1181	3/8	3/8	2-5/16
16255	16005	3.5	.1378	3/8	1/2	2-3/8
16256	16006	4.0	.1575	3/8	1/2	2-3/8
16257	16007	4.5	.1772	3/8	9/16	2-1/2
16258	16008	5.0	.1969	3/8	9/16	2-1/2
16259	16009	5.5	.2165	3/8	5/8	2-1/2
16260	16010	6.0	.2362	3/8	5/8	2-1/2
16261	16011	7.0	.2756	3/8	11/16	2-1/2
16262	16012	8.0	.3150	3/8	3/4	2-1/2
16263	16013	9.0	.3543	3/8	3/4	2-1/2
16264	16014	10.0	.3937	3/8	1	2-11/16
16265	16015	11.0	.4330	3/8	1	2-11/16
16266	16016	12.0	.4724	3/8	1	2-11/16
16267	16017	12.5	.4921	1/2	1-1/4	3-1/4
16268	16018	13.0	.5118	1/2	1-1/4	3-1/4
16270	16020	14.0	.5512	1/2	1-3/8	3-3/8
16276	16026	16.0	.6299	5/8	1-5/8	3-3/4
16280	16030	18.0	.7087	5/8	1-5/8	3-3/4
16282	16032	20.0	.7874	5/8	1-7/8	4-1/8
16284	16034	22.0	.8661	3/4	1-7/8	4-1/8
16288	16038	24.0	.9449	3/4	2	4-1/2
16290	16040	25.0	.9843	1	2	4-1/2
16296	16046	32.0	1.2598	1	2	4-1/2
16298	16048	36.0	1.4173	1	2	4-1/2
16300	16050	40.0	1.5748	1-1/4	2	4-1/2
16302	16052	45.0	1.7717	1-1/4	2	4-1/2

Mill Dia. Tolerance (inch)	
0~+.0010	** 0~+.0015

** The shank of end mills is the same diameter as the cutting portion.

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■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

ISO	P											M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel		Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	○	◎	◎	○	○	◎	○									

ISO	N										S						H			
Material Description	Aluminum-wrought alloy		Aluminum-cast, alloyed			Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials		Heat Resistant Super Alloys					Titanium Alloys		Hardened steel		Hardened Cast Iron
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	○	○	○	○	○	○	○	○													

COBALT & HSS END MILLS

END MILL SET SERIES

▶ Various range of sizes in these end mill sets gives you plenty of opportunities to reduce manufacturing costs and improve productivity.

SET OF MINIATURE, (3/16″ SHANK) DOUBLE

EDP No. 8% COBALT (M42)	ITEM No. 8% COBALT (M42)	EDP No. HSS (M2)	ITEM No. HSS (M2)	Type	Length	Mill Diameter	No.of Flute
96002	CMR211	96001	MR211	Sq. END (11PCS)	REGULAR	1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16	2
96004	CMR409	96003	MR409	Sq. END (9PCS)	REGULAR	1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16	4
96006	CMS211	96005	MS211	Sq. END (11PCS)	STUB	1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16	2
96008	CMS409	96007	MS409	Sq. END (9PCS)	STUB	1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16	4

＊WITH TRANSPARENT PLASTIC CASE

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■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

SET OF 3/8″ SHANK, (WELDON) SINGLE

EDP No. 8% COBALT (M42)	ITEM No. 8% COBALT (M42)	EDP No. HSS (M2)	ITEM No. HSS (M2)	Type	Length	Mill Diameter	No.of Flute
96010	CWR205	96009	WR205	Sq. END (5PCS)	REGULAR	1/8, 3/16, 1/4, 5/16, 3/8	2
96012	CWR405	96011	WR405	Sq. END (5PCS)	REGULAR	1/8, 3/16, 1/4, 5/16, 3/8	4
96014	CWRC05	96013	WRC05	CENTER CUT (5PCS)	REGULAR	1/8, 3/16, 1/4, 5/16, 3/8	04

＊WITH TRANSPARENT PLASTIC CASE

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■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

COBALT & HSS END MILLS

END MILL SET SERIES

▶ Various range of sizes in these end mill sets gives you a plenty of opportunities to reduce manufacturing costs and improve productivity.

■ SET OF 3/8″SHANK, (WELDON) DOUBLE

EDP No.	ITEM No.	EDP No.	ITEM No.	Type	Length	Mill Diameter	No.of Flute
8% COBALT (M42)		HSS (M2)					
96016	CDR209	96015	DR209	Sq. END (9PCS)	REGULAR	1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8	2
96018	CDR409	96017	DR409	Sq. END (9PCS)	REGULAR	1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8	4
96020	CDRC09	96019	DRC09	CENTER CUT (9PCS)	REGULAR	1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8	4

＊WITH TRANSPARENT PLASTIC CASE

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

COBALT & HSS END MILLS

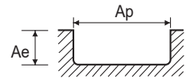
RECOMMENDED CUTTING CONDITIONS

E2030, E1030, E2080, E1080, E2033 E1033, E2050, E1050, E2163, E1163 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-3/8	1-1/2	1-3/4	2
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	115	120	110	120	115	125	115	120	120	110	120	130	130
					IPT(fz)	.0003	.0010	.0018	.0024	.0031	.0032	.0040	.0039	.0039	.0039	.0039	.0043	.0040
					RPM	3500	1800	1100	900	700	630	500	450	400	310	310	280	250
					IPM(FEED)	2	4	4	4	4	4	4	4	3	2	2	2	2
	2		1.0D	0.5D	SFM(Vc)	105	105	90	105	90	100	105	105	105	90	100	100	100
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0047
					RPM	3200	1600	900	800	560	500	450	400	350	250	250	220	190
					IPM(FEED)	2	3	4	4	4	4	4	3	3	2	2	2	2
	3-4		1.0D	0.5D	SFM(Vc)	80	80	80	80	75	80	80	80	80	70	80	80	60
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0040	.0039	.0039	.0040	.0040	.0044	.0045
					RPM	2500	1200	800	630	450	400	350	310	280	200	200	180	110
					IPM(FEED)	2	2	3	3	3	3	3	2	2	2	2	2	1
	5		1.0D	0.5D	SFM(Vc)	50	50	45	50	45	50	50	45	45	45	45	50	40
					IPT(fz)	.0003	.0010	.0020	.0025	.0032	.0036	.0041	.0039	.0038	.0042	.0042	.0045	.0050
					RPM	1600	800	450	400	280	250	220	180	160	120	120	110	80
					IPM(FEED)	1	2	2	2	2	2	2	1	1	1	1	1	1
	6	Low alloy steel	1.0D	0.5D	SFM(Vc)	105	105	90	105	90	100	105	105	105	90	100	100	100
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0047
					RPM	3200	1600	900	800	560	500	450	400	350	250	250	220	190
					IPM(FEED)	2	3	4	4	4	4	4	3	3	2	2	2	2
	7		1.0D	0.5D	IPM(FEED)	80	80	80	80	75	80	80	80	80	70	80	80	60
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0040	.0039	.0039	.0040	.0040	.0044	.0045
					RPM	2500	1200	800	630	450	400	350	310	280	200	200	180	110
					IPM(FEED)	2	2	3	3	3	3	3	2	2	2	2	2	1
	8-9		1.0D	0.5D	SFM(Vc)	50	50	45	50	45	50	50	45	45	45	45	50	40
					IPT(fz)	.0003	.0010	.0020	.0025	.0032	.0036	.0041	.0039	.0038	.0042	.0042	.0045	.0050
					RPM	1600	800	450	400	280	250	220	180	160	120	120	110	80
					IPM(FEED)	1	2	2	2	2	2	2	1	1	1	1	1	1
	10	High alloyed steel, and tool steel	1.0D	0.5D	IPM(FEED)	105	105	90	105	90	100	105	105	105	90	100	100	100
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0047
					RPM	3200	1600	900	800	560	500	450	400	350	250	250	220	190
					IPM(FEED)	2	3	4	4	4	4	4	3	3	2	2	2	2
	11.1		1.0D	0.5D	SFM(Vc)	50	50	45	50	45	50	50	45	45	45	45	50	40
					IPT(fz)	.0003	.0010	.0020	.0025	.0032	.0036	.0041	.0039	.0038	.0042	.0042	.0045	.0050
					RPM	1600	800	450	400	280	250	220	180	160	120	120	110	80
					IPM(FEED)	1	2	2	2	2	2	2	1	1	1	1	1	1
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	IPM(FEED)	360	365	305	325	325	355	320	315	325	325	355	365	330
					IPT(fz)	.0004	.0011	.0025	.0030	.0035	.0038	.0042	.0046	.0048	.0048	.0048	.0049	.0050
					RPM	11000	5600	3100	2500	2000	1800	1400	1200	1100	900	900	800	630
					IPM(FEED)	10	12	16	15	14	14	12	11	11	9	9	8	6
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	360	365	305	325	325	355	320	315	325	325	355	365	330
					IPT(fz)	.0004	.0011	.0025	.0030	.0035	.0038	.0042	.0046	.0048	.0048	.0048	.0049	.0050
					RPM	11000	5600	3100	2500	2000	1800	1400	1200	1100	900	900	800	630
					IPM(FEED)	10	12	16	15	14	14	12	11	11	9	9	8	6



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

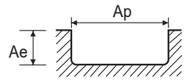
E2030, E1030, E2080, E1080, E2033 E1033, E2050, E1050, E2163, E1163 SERIES

TiN Coated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-3/8	1-1/2	1-3/4	2
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	135	140	130	145	135	150	135	140	140	135	145	155	155
					IPT(fz)	.0003	.0010	.0018	.0024	.0031	.0032	.0040	.0039	.0039	.0039	.0039	.0043	.0040
					RPM	4200	2160	1320	1090	840	760	600	540	480	370	370	340	300
					IPM(FEED)	3	4	5	5	5	5	5	4	4	3	3	3	2
	2		1.0D	0.5D	SFM(Vc)	125	125	105	125	110	120	125	125	125	110	120	120	120
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0048
					RPM	3840	1920	1080	960	670	600	540	480	420	300	300	260	230
					IPM(FEED)	2	4	4	5	4	4	4	4	3	2	2	2	2
	3-4		1.0D	0.5D	SFM(Vc)	100	95	95	100	90	95	95	95	100	85	95	100	70
					IPT(fz)	.0003	.0010	.0019	.0024	.0034	.0035	.0040	.0039	.0039	.0040	.0040	.0044	.0045
					RPM	3000	1440	960	760	540	480	420	370	340	240	240	220	130
					IPM(FEED)	2	3	4	4	4	3	3	3	3	2	2	2	1
	5		1.0D	0.5D	SFM(Vc)	65	65	55	65	55	60	60	70	125	50	55	60	50
					IPT(fz)	.0003	.0010	.0020	.0025	.0033	.0037	.0042	.0042	.0020	.0042	.0042	.0045	.0052
					RPM	1920	960	540	480	340	300	260	260	430	140	140	130	100
					IPM(FEED)	1	2	2	2	2	2	2	2	2	1	1	1	1
	6		1.0D	0.5D	SFM(Vc)	125	125	105	125	110	120	125	125	125	110	120	120	120
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0048
					RPM	3840	1920	1080	960	670	600	540	480	420	300	300	260	230
					IPM(FEED)	2	4	4	5	4	4	4	4	3	2	2	2	2
	7	Low alloy steel	1.0D	0.5D	IPM(FEED)	100	95	95	100	90	95	95	95	100	85	95	100	70
					IPT(fz)	.0003	.0010	.0019	.0024	.0034	.0035	.0040	.0039	.0039	.0040	.0040	.0044	.0045
					RPM	3000	1440	960	760	540	480	420	370	340	240	240	220	130
					IPM(FEED)	2	3	4	4	4	3	3	3	3	2	2	2	1
	8-9		1.0D	0.5D	SFM(Vc)	65	65	55	65	55	60	60	70	125	50	55	60	50
					IPT(fz)	.0003	.0010	.0020	.0025	.0033	.0037	.0042	.0042	.0020	.0042	.0042	.0045	.0052
					RPM	1920	960	540	480	340	300	260	260	430	140	140	130	100
					IPM(FEED)	1	2	2	2	2	2	2	2	2	1	1	1	1
	10	High alloyed steel, and tool steel	1.0D	0.5D	IPM(FEED)	125	125	105	125	110	120	125	125	125	110	120	120	120
					IPT(fz)	.0003	.0010	.0019	.0025	.0031	.0035	.0039	.0039	.0040	.0040	.0040	.0045	.0048
					RPM	3840	1920	1080	960	670	600	540	480	420	300	300	260	230
					IPM(FEED)	2	4	4	5	4	4	4	4	3	2	2	2	2
	11.1		1.0D	0.5D	SFM(Vc)	65	65	55	65	55	60	60	70	125	50	55	60	50
					IPT(fz)	.0003	.0010	.0020	.0025	.0033	.0037	.0042	.0042	.0020	.0042	.0042	.0045	.0052
					RPM	1920	960	540	480	340	300	260	260	430	140	140	130	100
					IPM(FEED)	1	2	2	2	2	2	2	2	2	1	1	1	1
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	IPM(FEED)	430	440	365	395	395	425	385	375	390	390	425	440	395
					IPT(fz)	.0004	.0011	.0026	.0030	.0035	.0038	.0042	.0046	.0048	.0048	.0048	.0049	.0050
					RPM	13200	6720	3720	3000	2400	2160	1680	1440	1320	1080	1080	960	760
					IPM(FEED)	12	15	19	18	17	17	14	13	13	10	10	10	8
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	430	440	365	395	395	425	385	375	390	390	425	440	395
					IPT(fz)	.0004	.0011	.0026	.0030	.0035	.0038	.0042	.0046	.0048	.0048	.0048	.0049	.0050
					RPM	13200	6720	3720	3000	2400	2160	1680	1440	1320	1080	1080	960	760
					IPM(FEED)	12	15	19	18	17	17	14	13	13	10	10	10	8



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

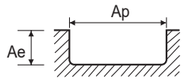
E2030, E1030, E2080, E1080, E2033 E1033, E2050, E1050, E2163, E1163 SERIES

TiCN Coated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

2 FLUTE - SLOTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-3/8	1-1/2	1-3/4	2
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	150	155	140	155	150	160	150	155	155	145	160	165	170
					IPT(fz)	.0003	.0010	.0018	.0024	.0031	.0032	.0040	.0039	.0038	.0038	.0038	.0043	.0040
					RPM	4550	2340	1430	1170	910	820	650	590	520	400	400	360	330
					IPM(FEED)	3	5	5	6	6	5	5	5	4	4	3	3	3
	2		1.0D	0.5D	SFM(Vc)	125	135	115	135	120	130	135	135	135	115	130	130	120
					IPT(fz)	.0003	.0010	.0020	.0025	.0032	.0035	.0039	.0038	.0040	.0040	.0040	.0045	.0050
					RPM	3840	2080	1170	1040	730	650	590	520	460	330	330	290	230
					IPM(FEED)	2	4	5	5	5	5	5	4	4	3	3	3	2
	3-4		1.0D	0.5D	SFM(Vc)	105	100	100	105	95	100	105	105	105	95	100	105	75
					IPT(fz)	.0003	.0010	.0019	.0024	.0031	.0035	.0040	.0038	.0040	.0040	.0040	.0045	.0045
					RPM	3250	1560	1040	820	590	520	460	400	360	260	260	230	140
					IPM(FEED)	2	3	4	4	4	4	4	3	3	2	2	2	1
	5		1.0D	0.5D	SFM(Vc)	65	70	55	70	60	65	65	60	60	55	60	65	55
					IPT(fz)	.0002	.0015	.0027	.0027	.0032	.0035	.0040	.0038	.0038	.0042	.0042	.0045	.0048
					RPM	2050	1040	590	520	360	330	290	230	210	160	160	140	100
					IPM(FEED)	1	3	3	3	2	2	2	2	2	1	1	1	1
	6		1.0D	0.5D	SFM(Vc)	125	135	115	135	120	130	135	135	135	115	130	130	120
					IPT(fz)	.0003	.0010	.0020	.0025	.0032	.0035	.0039	.0038	.0040	.0040	.0040	.0045	.0050
					RPM	3840	2080	1170	1040	730	650	590	520	460	330	330	290	230
					IPM(FEED)	2	4	5	5	5	5	5	4	4	3	3	3	2
	7	Low alloy steel	1.0D	0.5D	IPM(FEED)	105	100	100	105	95	100	105	105	105	95	100	105	75
					IPT(fz)	.0003	.0010	.0019	.0024	.0031	.0035	.0040	.0038	.0040	.0040	.0040	.0045	.0045
					RPM	3250	1560	1040	820	590	520	460	400	360	260	260	230	140
					IPM(FEED)	2	3	4	4	4	4	4	3	3	2	2	2	1
	8-9		1.0D	0.5D	SFM(Vc)	65	70	55	70	60	65	65	60	60	55	60	65	55
					IPT(fz)	.0002	.0015	.0027	.0027	.0032	.0035	.0040	.0038	.0038	.0042	.0042	.0045	.0048
					RPM	2050	1040	590	520	360	330	290	230	210	160	160	140	100
					IPM(FEED)	1	3	3	3	2	2	2	2	2	1	1	1	1
	10	High alloyed steel, and tool steel	1.0D	0.5D	IPM(FEED)	125	135	115	135	120	130	135	135	135	115	130	130	120
					IPT(fz)	.0003	.0010	.0020	.0025	.0032	.0035	.0039	.0038	.0040	.0040	.0040	.0045	.0050
					RPM	3840	2080	1170	1040	730	650	590	520	460	330	330	290	230
					IPM(FEED)	2	4	5	5	5	5	5	4	4	3	3	3	2
	11.1		1.0D	0.5D	SFM(Vc)	65	70	55	70	60	65	65	60	60	55	60	65	55
					IPT(fz)	.0002	.0015	.0027	.0027	.0032	.0035	.0040	.0038	.0038	.0042	.0042	.0045	.0048
					RPM	2050	1040	590	520	360	330	290	230	210	160	160	140	100
					IPM(FEED)	1	3	3	3	2	2	2	2	2	1	1	1	1
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	IPM(FEED)	470	475	395	425	425	460	415	410	420	420	460	475	430
					IPT(fz)	.0004	.0011	.0025	.0030	.0034	.0038	.0042	.0046	.0048	.0048	.0048	.0050	.0050
					RPM	14300	7280	4030	3250	2600	2340	1820	1560	1430	1170	1170	1040	820
					IPM(FEED)	13	16	21	20	18	18	15	14	14	11	11	10	8
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	470	475	395	425	425	460	415	410	420	420	460	475	430
					IPT(fz)	.0004	.0011	.0025	.0030	.0034	.0038	.0042	.0046	.0048	.0048	.0048	.0050	.0050
					RPM	14300	7280	4030	3250	2600	2340	1820	1560	1430	1170	1170	1040	820
					IPM(FEED)	13	16	21	20	18	18	15	14	14	11	11	10	8



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

E1070, E1071, E1072 SERIES

2 FLUTE for ALUMINIUM - SIDE CUTTING & SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	SIDE CUTTING Ae	SIDE CUTTING Ap	SLOTTING Ae	SLOTTING Ap	Parameter	Diameter (Ø) 1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	13/16
K	15-16	Grey cast iron	ø1/8~ø5/16 = 0.25D ø7/16~ø13/16 = 0.5D	1.0D	1.0D	0.5D	SFM(Vc)	260	365	445	425	575	590	515	575	450	425
							IPT(fz)	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168
							RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000
							IPM(FEED)	29	33	37	55	47	61	63	63	67	67
	17-18	Nodular cast iron	ø1/8~ø5/16 = 0.25D ø7/16~ø13/16 = 0.5D	1.0D	1.0D	0.5D	SFM(Vc)	260	365	445	425	575	590	515	575	450	425
							IPT(fz)	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168
							RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000
							IPM(FEED)	29	33	37	55	47	61	63	63	67	67
	19-20	Low alloy steel	ø1/8~ø5/16 = 0.25D ø7/16~ø13/16 = 0.5D	1.0D	1.0D	0.5D	SFM(Vc)	260	365	445	425	575	590	515	575	450	425
							IPT(fz)	.0018	.0022	.0027	.0053	.0047	.0068	.0090	.0090	.0146	.0168
							RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000
							IPM(FEED)	29	33	37	55	47	61	63	63	67	67
N	21-22	Aluminum-wrought alloy			1.0D	0.5D	SFM(Vc)	260	365	445	425	575	590	515	575	450	425
							IPT(fz)	.0014	.0017	.0021	.0042	.0047	.0052	.0070	.0070	.0111	.0128
							RPM	8000	7400	6800	5200	5000	4500	3500	3500	2300	2000
							IPM(FEED)	23	25	29	44	47	47	49	49	51	51
	23-25	Aluminum-cast, alloyed			1.0D	0.5D	SFM(Vc)	170	235	290	275	370	385	335	370	295	275
							IPT(fz)	.0014	.0017	.0021	.0042	.0047	.0052	.0070	.0070	.0111	.0128
							RPM	5200	4810	4420	3380	3250	2930	2280	2280	1500	1300
							IPM(FEED)	15	16	19	28	31	31	32	32	33	33

※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

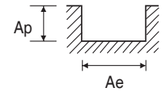
RECOMMENDED CUTTING CONDITIONS

E2160, E2161 SERIES

3 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	1/4	3/8	1/2	9/16	5/8	7/8	1	1-1/8
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	135	115	120	110	120	120	115	115	120	120
					IPT(fz)	.0001	.0003	.0010	.0018	.0024	.0027	.0031	.0040	.0039	.0039
					RPM	5600	3500	1800	1100	900	800	700	500	450	400
					IPM(FEED)	2	3	5	6	7	7	7	6	5	5
	2		1.0D	0.5D	SFM(Vc)	110	105	105	90	105	105	90	105	105	105
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039
					RPM	4500	3200	1600	900	800	700	560	450	400	350
					IPM(FEED)	2	3	5	5	6	5	5	5	5	4
	3-4		1.0D	0.5D	SFM(Vc)	100	80	80	80	80	80	75	80	80	80
					IPT(fz)	.0002	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0037
					RPM	4000	2500	1200	800	630	560	450	350	310	280
					IPM(FEED)	2	2	4	5	5	5	4	4	4	3
	5		1.0D	0.5D	SFM(Vc)	55	50	50	45	50	50	45	50	45	45
					IPT(fz)	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038
					RPM	2200	1600	800	450	400	350	280	220	180	160
					IPM(FEED)	1	1	2	3	3	3	3	3	2	2
	6		1.0D	0.5D	SFM(Vc)	110	105	105	90	105	105	90	105	105	105
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039
					RPM	4500	3200	1600	900	800	700	560	450	400	350
					IPM(FEED)	2	3	5	5	6	5	5	5	5	4
	7	Low alloy steel	1.0D	0.5D	IPM(FEED)	100	80	80	80	80	80	75	80	80	80
					IPT(fz)	.0002	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0037
					RPM	4000	2500	1200	800	630	560	450	350	310	280
					IPM(FEED)	2	2	4	5	5	5	4	4	4	3
	8-9		1.0D	0.5D	SFM(Vc)	55	50	50	45	50	50	45	50	45	45
					IPT(fz)	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038
					RPM	2200	1600	800	450	400	350	280	220	180	160
					IPM(FEED)	1	1	2	3	3	3	3	3	2	2
	10	High alloyed steel, and tool steel	1.0D	0.5D	IPM(FEED)	110	105	105	90	105	105	90	105	105	105
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039
					RPM	4500	3200	1600	900	800	700	560	450	400	350
					IPM(FEED)	2	3	5	5	6	5	5	5	5	4
	11.1		1.0D	0.5D	SFM(Vc)	55	50	50	45	50	50	45	50	45	45
					IPT(fz)	.0001	.0003	.0010	.0019	.0025	.0029	.0031	.0039	.0037	.0038
					RPM	2200	1600	800	450	400	350	280	220	180	160
					IPM(FEED)	1	1	2	3	3	3	3	3	2	2
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	IPM(FEED)	295	360	365	305	325	325	325	320	315	325
					IPT(fz)	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048
					RPM	12000	11000	5600	3100	2500	2200	2000	1400	1200	1100
					IPM(FEED)	9	15	19	24	22	21	21	18	17	16
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	295	360	365	305	325	325	325	320	315	325
					IPT(fz)	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048
					RPM	12000	11000	5600	3100	2500	2200	2000	1400	1200	1100
					IPM(FEED)	9	15	19	24	22	21	21	18	17	16



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

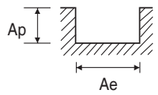
RECOMMENDED CUTTING CONDITIONS

E2160, E2161 SERIES — TiN Coated

3 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	1/4	3/8	1/2	9/16	5/8	7/8	1	1-1/8	1-3/16
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	165	135	140	130	140	125	125	135	140	125	130
					IPT(fz)	.0001	.0003	.0010	.0018	.0024	.0031	.0032	.0040	.0040	.0043	.0039
					RPM	6720	4200	2160	1320	1080	840	760	600	540	430	420
					IPM(FEED)	3	4	6	7	8	8	7	7	6	6	5
	2		1.0D	0.5D	SFM(Vc)	135	125	125	105	125	100	100	125	125	125	110
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0032	.0036	.0040	.0039	.0039	.0038
					RPM	5400	3840	1920	1080	960	670	600	540	480	420	370
					IPM(FEED)	2	3	6	6	7	6	6	6	6	5	4
	3-4		1.0D	0.5D	SFM(Vc)	120	100	95	95	100	80	80	95	95	100	90
					IPT(fz)	.0002	.0003	.0010	.0019	.0025	.0030	.0034	.0039	.0038	.0037	.0040
					RPM	4800	3000	1440	960	760	540	480	420	370	340	300
					IPM(FEED)	2	3	4	6	6	5	5	5	4	4	4
	5		1.0D	0.5D	SFM(Vc)	65	65	65	55	65	50	50	60	55	55	55
					IPT(fz)	.0001	.0002	.0010	.0019	.0025	.0031	.0034	.0039	.0037	.0038	.0038
					RPM	2640	1920	960	540	480	340	300	260	220	190	190
					IPM(FEED)	1	1	3	3	4	3	3	3	2	2	2
	6	Low alloy steel	1.0D	0.5D	SFM(Vc)	135	125	125	105	125	100	100	125	125	125	110
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0032	.0036	.0040	.0039	.0039	.0038
					RPM	5400	3840	1920	1080	960	670	600	540	480	420	370
					IPM(FEED)	2	3	6	6	7	6	6	6	6	5	4
	7		1.0D	0.5D	IPM(FEED)	120	100	95	95	100	80	80	95	95	100	90
					IPT(fz)	.0002	.0003	.0010	.0019	.0025	.0030	.0034	.0039	.0038	.0037	.0040
					RPM	4800	3000	1440	960	760	540	480	420	370	340	300
					IPM(FEED)	2	3	4	6	6	5	5	5	4	4	4
	8-9		1.0D	0.5D	SFM(Vc)	65	65	65	55	65	50	50	60	55	55	55
					IPT(fz)	.0001	.0002	.0010	.0019	.0025	.0031	.0034	.0039	.0037	.0038	.0038
					RPM	2640	1920	960	540	480	340	300	260	220	190	190
					IPM(FEED)	1	1	3	3	4	3	3	3	2	2	2
	10	High alloyed steel, and tool steel	1.0D	0.5D	IPM(FEED)	135	125	125	105	125	100	100	125	125	125	110
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0032	.0036	.0040	.0039	.0039	.0038
					RPM	5400	3840	1920	1080	960	670	600	540	480	420	370
					IPM(FEED)	2	3	6	6	7	6	6	6	6	5	4
	11.1		1.0D	0.5D	SFM(Vc)	65	65	65	55	65	50	50	60	55	55	55
					IPT(fz)	.0001	.0002	.0010	.0019	.0025	.0031	.0034	.0039	.0037	.0038	.0038
					RPM	2640	1920	960	540	480	340	300	260	220	190	190
					IPM(FEED)	1	1	3	3	4	3	3	3	2	2	2
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	IPM(FEED)	355	430	440	365	395	355	355	385	375	390	390
					IPT(fz)	.0003	.0005	.0011	.0025	.0030	.0035	.0039	.0042	.0046	.0048	.0048
					RPM	14400	13200	6720	3720	3000	2400	2160	1680	1440	1320	1320
					IPM(FEED)	11	18	22	28	27	25	25	21	20	19	19
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	355	430	440	365	395	355	355	385	375	390	390
					IPT(fz)	.0003	.0005	.0011	.0025	.0030	.0035	.0039	.0042	.0046	.0048	.0048
					RPM	14400	13200	6720	3720	3000	2400	2160	1680	1440	1320	1320
					IPM(FEED)	11	18	22	28	27	25	25	21	20	19	19



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

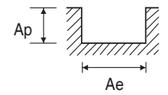
RECOMMENDED CUTTING CONDITIONS

E2160, E2161 SERIES — TiCN Coated

3 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	1/4	3/8	1/2	9/16	5/8	7/8	1	1-1/8
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	180	150	155	140	155	155	150	150	155	155
					IPT(fz)	.0001	.0003	.0010	.0018	.0024	.0027	.0031	.0040	.0039	.0044
					RPM	7280	4550	2340	1430	1170	1040	910	650	590	520
					IPM(FEED)	3	4	7	8	9	9	9	8	7	7
	2		1.0D	0.5D	SFM(Vc)	145	75	135	115	135	135	120	135	135	135
					IPT(fz)	.0001	.0005	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039
					RPM	5850	2340	2080	1170	1040	910	730	590	520	460
					IPM(FEED)	2	3	6	7	8	7	7	7	6	5
	3-4		1.0D	0.5D	SFM(Vc)	130	105	100	100	105	105	95	105	105	105
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0039
					RPM	5200	3250	1560	1040	820	730	590	460	400	360
					IPM(FEED)	2	3	5	6	6	6	5	5	5	4
	5		1.0D	0.5D	SFM(Vc)	70	70	70	55	70	65	60	65	60	60
					IPT(fz)	.0001	.0003	.0010	.0019	.0024	.0028	.0031	.0040	.0037	.0037
					RPM	2860	2080	1040	590	520	460	360	290	230	210
					IPM(FEED)	1	2	3	3	4	4	3	3	3	2
	6	Low alloy steel	1.0D	0.5D	SFM(Vc)	145	75	135	115	135	135	120	135	135	135
					IPT(fz)	.0001	.0005	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039
					RPM	5850	2340	2080	1170	1040	910	730	590	520	460
					IPM(FEED)	2	3	6	7	8	7	7	7	6	5
	7		1.0D	0.5D	IPM(FEED)	130	105	100	100	105	105	95	105	105	105
					IPT(fz)	.0001	.0003	.0010	.0020	.0025	.0028	.0030	.0039	.0038	.0039
					RPM	5200	3250	1560	1040	820	730	590	460	400	360
					IPM(FEED)	2	3	5	6	6	6	5	5	5	4
	8-9		1.0D	0.5D	SFM(Vc)	70	70	70	55	70	65	60	65	60	60
					IPT(fz)	.0001	.0003	.0010	.0019	.0024	.0028	.0031	.0040	.0037	.0037
					RPM	2860	2080	1040	590	520	460	360	290	230	210
					IPM(FEED)	1	2	3	3	4	4	3	3	3	2
	10	High alloyed steel, and tool steel	1.0D	0.5D	IPM(FEED)	145	75	135	115	135	135	120	135	135	135
					IPT(fz)	.0001	.0005	.0010	.0020	.0025	.0025	.0032	.0039	.0039	.0039
					RPM	5850	2340	2080	1170	1040	910	730	590	520	460
					IPM(FEED)	2	3	6	7	8	7	7	7	6	5
	11.1		1.0D	0.5D	SFM(Vc)	70	70	70	55	70	65	60	65	60	60
					IPT(fz)	.0001	.0003	.0010	.0019	.0024	.0028	.0031	.0040	.0037	.0037
					RPM	2860	2080	1040	590	520	460	360	290	230	210
					IPM(FEED)	1	2	3	3	4	4	3	3	3	2
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	IPM(FEED)	385	470	475	395	425	420	425	415	410	420
					IPT(fz)	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048
					RPM	15600	14300	7280	4030	3250	2860	2600	1820	1560	1430
					IPM(FEED)	12	20	24	31	29	27	27	23	22	21
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	385	470	475	395	425	420	425	415	410	420
					IPT(fz)	.0003	.0005	.0011	.0025	.0030	.0032	.0035	.0042	.0046	.0048
					RPM	15600	14300	7280	4030	3250	2860	2600	1820	1560	1430
					IPM(FEED)	12	20	24	31	29	27	27	23	22	21



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

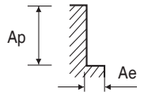
RECOMMENDED CUTTING CONDITIONS

E2160, E2161 SERIES

3 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	11/16	13/16	7/8	1	1-1/8	1-3/16
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	135	115	115	110	120	115	110	120	120	115	115	120	115	120	120	110
					IPT(fz)	.0001	.0003	.0005	.0008	.0010	.0014	.0018	.0024	.0027	.0031	.0032	.0036	.0040	.0039	.0039	.0039
					RPM	5600	3500	2800	2200	1800	1400	1100	900	800	700	630	560	500	450	400	350
					IPM(FEED)	2	3	4	5	5	6	6	7	7	7	6	6	6	5	5	4
	2		0.1D	1.5D	SFM(Vc)	110	105	90	90	105	90	90	105	105	90	90	95	105	105	105	95
					IPT(fz)	.0001	.0003	.0005	.0007	.0009	.0014	.0017	.0022	.0022	.0028	.0031	.0035	.0035	.0036	.0035	.0033
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310
					IPM(FEED)	2	2	3	4	4	5	5	5	5	5	5	5	5	4	4	3
	3-4		0.1D	1.5D	SFM(Vc)	100	80	75	80	80	75	80	80	80	75	70	85	80	80	80	80
					IPT(fz)	.0001	.0002	.0004	.0005	.0007	.0011	.0016	.0020	.0023	.0023	.0026	.0026	.0030	.0028	.0029	.0029
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250
					IPM(FEED)	1	2	2	3	3	3	4	4	4	3	3	3	3	3	2	2
	5		0.1D	1.5D	SFM(Vc)	55	50	45	45	50	45	45	50	50	45	45	45	50	45	45	50
					IPT(fz)	.0001	.0002	.0004	.0005	.0008	.0012	.0015	.0018	.0021	.0024	.0027	.0030	.0030	.0026	.0025	.0025
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160
					IPM(FEED)	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	110	105	90	90	105	90	90	105	105	90	90	95	105	105	105	95
					IPT(fz)	.0001	.0003	.0005	.0007	.0009	.0014	.0017	.0022	.0022	.0028	.0031	.0035	.0035	.0036	.0035	.0033
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310
					IPM(FEED)	2	2	3	4	4	5	5	5	5	5	5	5	5	4	4	3
	7		0.1D	1.5D	IPM(FEED)	100	80	75	80	80	75	80	80	80	75	70	85	80	80	80	80
					IPT(fz)	.0001	.0002	.0004	.0005	.0007	.0011	.0016	.0020	.0023	.0023	.0026	.0026	.0030	.0028	.0029	.0029
					RPM	4000	2500	1800	1600	1200	900	800	630	560	450	400	400	350	310	280	250
					IPM(FEED)	1	2	2	3	3	3	4	4	4	3	3	3	3	3	2	2
	8-9		0.1D	1.5D	SFM(Vc)	55	50	45	45	50	45	45	50	50	45	45	45	50	45	45	50
					IPT(fz)	.0001	.0002	.0004	.0005	.0008	.0012	.0015	.0018	.0021	.0024	.0027	.0030	.0030	.0026	.0025	.0025
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160
					IPM(FEED)	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	110	105	90	90	105	90	90	105	105	90	90	95	105	105	105	95
					IPT(fz)	.0001	.0003	.0005	.0007	.0009	.0014	.0017	.0022	.0022	.0028	.0031	.0035	.0035	.0036	.0035	.0033
					RPM	4500	3200	2200	1800	1600	1100	900	800	700	560	500	450	450	400	350	310
					IPM(FEED)	2	2	3	4	4	5	5	5	5	5	5	5	5	4	4	3
	11.1		0.1D	1.5D	SFM(Vc)	55	50	45	45	50	45	45	50	50	45	45	45	50	45	45	50
					IPT(fz)	.0001	.0002	.0004	.0005	.0008	.0012	.0015	.0018	.0021	.0024	.0027	.0030	.0030	.0026	.0025	.0025
					RPM	2200	1600	1100	900	800	560	450	400	350	280	250	220	220	180	160	160
					IPM(FEED)	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	295	360	325	310	365	325	305	325	325	325	325	340	320	315	325	340
					IPT(fz)	.0002	.0003	.0005	.0007	.0008	.0014	.0019	.0023	.0024	.0026	.0029	.0030	.0032	.0035	.0036	.0036
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100
					IPM(FEED)	7	11	13	14	14	17	18	17	16	16	16	14	13	13	12	12
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	295	360	325	310	365	325	305	325	325	325	325	340	320	315	325	340
					IPT(fz)	.0002	.0003	.0005	.0007	.0008	.0014	.0019	.0023	.0024	.0026	.0029	.0030	.0032	.0035	.0036	.0036
					RPM	12000	11000	8000	6300	5600	4000	3100	2500	2200	2000	1800	1600	1400	1200	1100	1100
					IPM(FEED)	7	11	13	14	14	17	18	17	16	16	16	14	13	13	12	12



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

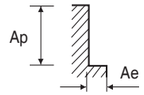
RECOMMENDED CUTTING CONDITIONS

E2160, E2161 SERIES TiN Coated

3 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	1/4	3/8	1/2	9/16	5/8	11/16	7/8	1	1-1/8
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	165	135	140	130	140	140	135	135	135	140	125
					IPT(fz)	.0001	.0003	.0010	.0018	.0024	.0027	.0031	.0032	.0040	.0040	.0043
					RPM	6720	4200	2160	1320	1080	960	840	760	600	540	430
					IPM(FEED)	3	4	6	7	8	8	8	7	7	6	6
	2		0.1D	1.5D	SFM(Vc)	135	125	125	105	125	125	110	110	125	125	125
					IPT(fz)	.0001	.0003	.0009	.0017	.0022	.0022	.0028	.0031	.0035	.0036	.0035
					RPM	5400	3840	1920	1080	960	840	670	600	540	480	420
					IPM(FEED)	2	3	5	6	6	6	6	6	6	5	4
	3-4		0.1D	1.5D	SFM(Vc)	120	100	95	95	100	100	90	85	95	95	100
					IPT(fz)	.0001	.0002	.0007	.0015	.0019	.0021	.0023	.0026	.0029	.0028	.0029
					RPM	4800	3000	1440	960	760	670	540	480	420	370	340
					IPM(FEED)	2	2	3	4	4	4	4	4	4	3	3
	5		0.1D	1.5D	SFM(Vc)	65	65	65	55	65	60	55	55	60	55	55
					IPT(fz)	.0001	.0002	.0008	.0015	.0018	.0021	.0024	.0027	.0030	.0026	.0024
					RPM	2640	1920	960	540	480	420	340	300	260	220	190
					IPM(FEED)	1	1	2	2	3	3	2	2	2	2	1
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	135	125	125	105	125	125	110	110	125	125	125
					IPT(fz)	.0001	.0003	.0009	.0017	.0022	.0022	.0028	.0031	.0035	.0036	.0035
					RPM	5400	3840	1920	1080	960	840	670	600	540	480	420
					IPM(FEED)	2	3	5	6	6	6	6	6	6	5	4
	7		0.1D	1.5D	IPM(FEED)	120	100	95	95	100	100	90	85	95	95	100
					IPT(fz)	.0001	.0002	.0007	.0015	.0019	.0021	.0023	.0026	.0029	.0028	.0029
					RPM	4800	3000	1440	960	760	670	540	480	420	370	340
					IPM(FEED)	2	2	3	4	4	4	4	4	4	3	3
	8-9		0.1D	1.5D	SFM(Vc)	65	65	65	55	65	60	55	55	60	55	55
					IPT(fz)	.0001	.0002	.0008	.0015	.0018	.0021	.0024	.0027	.0030	.0026	.0024
					RPM	2640	1920	960	540	480	420	340	300	260	220	190
					IPM(FEED)	1	1	2	2	3	3	2	2	2	2	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	135	125	125	105	125	125	110	110	125	125	125
					IPT(fz)	.0001	.0003	.0009	.0017	.0022	.0022	.0028	.0031	.0035	.0036	.0035
					RPM	5400	3840	1920	1080	960	840	670	600	540	480	420
					IPM(FEED)	2	3	5	6	6	6	6	6	6	5	4
	11.1		0.1D	1.5D	SFM(Vc)	65	65	65	55	65	60	55	55	60	55	55
					IPT(fz)	.0001	.0002	.0008	.0015	.0018	.0021	.0024	.0027	.0030	.0026	.0024
					RPM	2640	1920	960	540	480	420	340	300	260	220	190
					IPM(FEED)	1	1	2	2	3	3	2	2	2	2	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	355	430	440	365	395	390	395	390	385	375	390
					IPT(fz)	.0002	.0003	.0008	.0019	.0023	.0024	.0026	.0029	.0032	.0035	.0036
					RPM	14400	13200	6720	3720	3000	2640	2400	2160	1680	1440	1320
					IPM(FEED)	9	13	17	21	20	19	19	19	16	15	14
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	355	430	440	365	395	390	395	390	385	375	390
					IPT(fz)	.0002	.0003	.0008	.0019	.0023	.0024	.0026	.0029	.0032	.0035	.0036
					RPM	14400	13200	6720	3720	3000	2640	2400	2160	1680	1440	1320
					IPM(FEED)	9	13	17	21	20	19	19	19	16	15	14



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

COBALT & HSS END MILLS

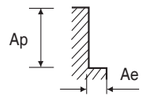
RECOMMENDED CUTTING CONDITIONS

E2160, E2161 SERIES — TiCN Coated

3 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 3/32	1/8	1/4	5/16	1/2	9/16	5/8	11/16	7/8	1	1-1/8
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	180	150	145	150	155	155	150	145	150	155	155
					IPT(fz)	.0001	.0003	.0010	.0014	.0024	.0027	.0031	.0032	.0040	.0039	.0039
					RPM	7280	4550	2240	1820	1170	1040	910	820	650	590	520
					IPM(FEED)	3	4	7	8	9	9	9	8	8	7	6
	2		0.1D	1.5D	SFM(Vc)	145	135	135	115	135	135	120	115	135	135	135
					IPT(fz)	.0001	.0002	.0009	.0012	.0022	.0022	.0028	.0031	.0035	.0036	.0035
					RPM	5850	4160	2080	1430	1040	910	730	650	590	520	460
					IPM(FEED)	2	3	6	5	7	6	6	6	6	6	5
	3-4		0.1D	1.5D	SFM(Vc)	130	105	100	95	105	105	95	95	105	105	105
					IPT(fz)	.0001	.0002	.0007	.0011	.0019	.0021	.0026	.0026	.0029	.0028	.0029
					RPM	5200	3250	1560	1170	820	730	590	520	460	400	360
					IPM(FEED)	2	2	3	4	5	5	5	4	4	3	3
	5		0.1D	1.5D	SFM(Vc)	70	70	70	60	70	65	60	60	65	60	60
					IPT(fz)	.0001	.0002	.0007	.0012	.0019	.0021	.0024	.0027	.0030	.0026	.0026
					RPM	2860	2080	1040	730	520	460	360	330	290	230	210
					IPM(FEED)	1	1	2	3	3	3	3	3	3	2	2
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	145	135	135	115	135	135	120	115	135	135	135
					IPT(fz)	.0001	.0002	.0009	.0012	.0022	.0022	.0028	.0031	.0035	.0036	.0035
					RPM	5850	4160	2080	1430	1040	910	730	650	590	520	460
					IPM(FEED)	2	3	6	5	7	6	6	6	6	6	5
	7		0.1D	1.5D	IPM(FEED)	130	105	100	95	105	105	95	95	105	105	105
					IPT(fz)	.0001	.0002	.0007	.0011	.0019	.0021	.0026	.0026	.0029	.0028	.0029
					RPM	5200	3250	1560	1170	820	730	590	520	460	400	360
					IPM(FEED)	2	2	3	4	5	5	5	4	4	3	3
	8-9		0.1D	1.5D	SFM(Vc)	70	70	70	60	70	65	60	60	65	60	60
					IPT(fz)	.0001	.0002	.0007	.0012	.0019	.0021	.0024	.0027	.0030	.0026	.0026
					RPM	2860	2080	1040	730	520	460	360	330	290	230	210
					IPM(FEED)	1	1	2	3	3	3	3	3	3	2	2
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	145	135	135	115	135	135	120	115	135	135	135
					IPT(fz)	.0001	.0002	.0009	.0012	.0022	.0022	.0028	.0031	.0035	.0036	.0035
					RPM	5850	4160	2080	1430	1040	910	730	650	590	520	460
					IPM(FEED)	2	3	6	5	7	6	6	6	6	6	5
	11.1		0.1D	1.5D	SFM(Vc)	70	70	70	60	70	65	60	60	65	60	60
					IPT(fz)	.0001	.0002	.0007	.0012	.0019	.0021	.0024	.0027	.0030	.0026	.0026
					RPM	2860	2080	1040	730	520	460	360	330	290	230	210
					IPM(FEED)	1	1	2	3	3	3	3	3	3	2	2
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	385	470	475	425	425	420	425	420	415	410	420
					IPT(fz)	.0002	.0003	.0008	.0014	.0023	.0024	.0026	.0029	.0032	.0035	.0036
					RPM	15600	14300	7280	5200	3250	2860	2600	2340	1820	1560	1430
					IPM(FEED)	9	14	18	23	22	21	21	21	17	16	15
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	385	470	475	425	425	420	425	420	415	410	420
					IPT(fz)	.0002	.0003	.0008	.0014	.0023	.0024	.0026	.0029	.0032	.0035	.0036
					RPM	15600	14300	7280	5200	3250	2860	2600	2340	1820	1560	1430
					IPM(FEED)	9	14	18	23	22	21	21	21	17	16	15



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

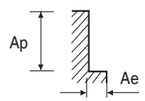
RECOMMENDED CUTTING CONDITIONS

E2120, E2121 SERIES

MULTI FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 1/4	1/4	5/8	5/8	3/4	3/4	1	1	1-1/2	1-1/2	2	2
			Ae	0.08D	0.32D	0.03D	0.3D	0.03D	0.35D	0.02D	0.3D	0.13D	0.05D	0.01D	0.8D
			Ap	1.4D	1.4D	1.6D	1.6D	1.6D	1.6D	1.6D	1.6D	1.05D	1.05D	1.0D	1.0D
P	1-5	Non-alloy steel	SFM(Vc)	120	105	125	105	100	90	120	105	110	95	115	100
			IPT(fz)	.0007	.0008	.0013	.0015	.0016	.0019	.0016	.0018	.0022	.0026	.0025	.0029
			RPM	1840	1600	750	650	520	450	460	400	280	240	220	190
			IPM(FEED)	4	4	3	3	3	3	3	3	3	3	2	2
	6-9	Low alloy steel	SFM(Vc)	120	105	125	105	100	90	120	105	110	95	115	100
			IPT(fz)	.0007	.0008	.0013	.0015	.0016	.0019	.0016	.0018	.0022	.0026	.0025	.0029
			RPM	1840	1600	750	650	520	450	460	400	280	240	220	190
			IPM(FEED)	4	4	3	3	3	3	3	3	3	3	2	2
	10-11	High alloyed steel, and tool steel	SFM(Vc)	80	45	75	65	75	65	75	65	65	60	75	65
			IPT(fz)	.0006	.0011	.0014	.0017	.0016	.0019	.0016	.0018	.0021	.0023	.0023	.0027
			RPM	1250	650	460	400	370	320	290	250	170	150	140	120
			IPM(FEED)	2	2	2	2	2	2	2	2	1	1	1	1
M	12-14	Stainless steel	SFM(Vc)	65	35	65	55	60	50	65	55	60	50	60	50
			IPT(fz)	.0006	.0010	.0012	.0014	.0016	.0018	.0015	.0017	.0022	.0025	.0024	.0028
			RPM	980	510	390	340	300	260	240	210	150	130	120	100
			IPM(FEED)	2	2	1	1	1	1	1	1	1	1	1	1
K	15-16	Grey cast iron	SFM(Vc)	135	70	135	120	125	110	135	115	125	110	135	120
			IPT(fz)	.0008	.0014	.0016	.0019	.0022	.0025	.0021	.0024	.0028	.0032	.0028	.0032
			RPM	2050	1100	840	730	630	550	510	440	320	280	260	230
			IPM(FEED)	5	5	4	4	4	4	4	4	4	4	3	3
	17-18	Nodular cast iron	SFM(Vc)	135	70	135	120	125	110	135	115	125	110	135	120
			IPT(fz)	.0008	.0014	.0016	.0019	.0022	.0025	.0021	.0024	.0028	.0032	.0028	.0032
			RPM	2050	1100	840	730	630	550	510	440	320	280	260	230
			IPM(FEED)	5	5	4	4	4	4	4	4	4	4	3	3
	19-20	Low alloy steel	SFM(Vc)	135	70	135	120	125	110	135	115	125	110	135	120
			IPT(fz)	.0008	.0014	.0016	.0019	.0022	.0025	.0021	.0024	.0028	.0032	.0028	.0032
			RPM	2050	1100	840	730	630	550	510	440	320	280	260	230
			IPM(FEED)	5	5	4	4	4	4	4	4	4	4	3	3



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

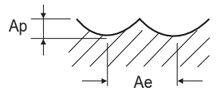
RECOMMENDED CUTTING CONDITIONS

E2110, E1110, E2111 E1111, E2112, E1112 SERIES

2 FLUTE BALL NOSE - PROFILE MILLING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	1/4	5/6	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM(Vc)	145	130	145	350	130	130	130	120	130
					IPT(fz)	.0004	.0007	.0012	.0020	.0027	.0034	.0038	.0046	.0051
					RPM	4500	3200	2200	1600	1300	1000	800	600	500
					IPM(FEED)	4	5	5	6	7	7	6	6	5
	2		0.7D	0.3D	SFM(Vc)	110	100	110	260	100	105	100	100	105
					IPT(fz)	.0004	.0006	.0010	.0017	.0024	.0026	.0033	.0034	.0035
					RPM	3400	2400	1700	1200	1000	800	600	500	400
					IPM(FEED)	3	3	4	4	5	4	4	3	3
	3-4		0.7D	0.3D	SFM(Vc)	65	55	65	155	55	60	55	60	60
					IPT(fz)	.0003	.0005	.0009	.0014	.0021	.0024	.0031	.0033	.0036
					RPM	2000	1400	1000	700	560	450	350	300	220
					IPM(FEED)	1	1	2	2	2	2	2	2	2
	5		0.7D	0.3D	SFM(Vc)	45	40	45	110	40	40	40	40	40
					IPT(fz)	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0038
					RPM	1400	1000	700	500	400	320	250	200	160
					IPM(FEED)	1	1	1	1	1	1	1	1	1
	6		0.7D	0.3D	SFM(Vc)	110	100	110	260	100	105	100	100	105
					IPT(fz)	.0004	.0006	.0010	.0017	.0024	.0026	.0033	.0034	.0035
					RPM	3400	2400	1700	1200	1000	800	600	500	400
					IPM(FEED)	3	3	4	4	5	4	4	3	3
	7	Low alloy steel	0.7D	0.3D	IPM(FEED)	65	55	65	155	55	60	55	60	60
					IPT(fz)	.0003	.0005	.0009	.0014	.0021	.0024	.0031	.0033	.0036
					RPM	2000	1400	1000	700	560	450	350	300	220
					IPM(FEED)	1	1	2	2	2	2	2	2	2
	8-9		0.7D	0.3D	SFM(Vc)	45	40	45	110	40	40	40	40	40
					IPT(fz)	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0038
					RPM	1400	1000	700	500	400	320	250	200	160
					IPM(FEED)	1	1	1	1	1	1	1	1	1
	10	High alloyed steel, and tool steel	0.7D	0.3D	IPM(FEED)	110	100	110	260	100	105	100	100	105
					IPT(fz)	.0004	.0006	.0010	.0017	.0024	.0026	.0033	.0034	.0035
					RPM	3400	2400	1700	1200	1000	800	600	500	400
					IPM(FEED)	3	3	4	4	5	4	4	3	3
	11.1		0.7D	0.3D	SFM(Vc)	45	40	45	110	40	40	40	40	40
					IPT(fz)	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0038
					RPM	1400	1000	700	500	400	320	250	200	160
					IPM(FEED)	1	1	1	1	1	1	1	1	1
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	IPM(FEED)	360	325	365	875	315	325	325	315	340
					IPT(fz)	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300
					IPM(FEED)	9	10	11	14	14	13	12	11	10
	23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	360	325	365	875	315	325	325	315	340
					IPT(fz)	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038
					RPM	11000	8000	5600	4000	3200	2500	2000	1600	1300
					IPM(FEED)	9	10	11	14	14	13	12	11	10



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

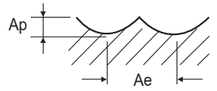
E2110, E1110, E2111 E1111, E2112, E1112 SERIES

TiN Coated

2 FLUTE BALL NOSE - PROFILE MILLING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	1/4	5/6	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM(Vc)	175	155	175	420	155	155	190	165	155
					IPT(fz)	.0004	.0007	.0012	.0020	.0027	.0034	.0038	.0046	.0051
					RPM	5400	3840	2640	1920	1560	1200	960	720	600
					IPM(FEED)	4	5	6	8	9	8	7	7	6
	2		0.7D	0.3D	SFM(Vc)	135	120	135	315	120	125	140	135	125
					IPT(fz)	.0004	.0006	.0010	.0017	.0023	.0026	.0033	.0034	.0035
					RPM	4080	2880	2040	1440	1200	960	720	600	480
					IPM(FEED)	3	4	4	5	6	5	5	4	3
	3-4		0.7D	0.3D	SFM(Vc)	80	70	80	185	65	70	80	80	70
					IPT(fz)	.0003	.0005	.0009	.0014	.0022	.0024	.0031	.0033	.0036
					RPM	2400	1680	1200	840	672	540	420	360	264
					IPM(FEED)	1	2	2	2	3	3	3	2	2
	5		0.7D	0.3D	SFM(Vc)	55	50	55	130	45	50	60	55	50
					IPT(fz)	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0036
					RPM	1680	1200	840	600	480	384	300	240	192
					IPM(FEED)	1	1	1	1	2	2	2	2	1
	6		0.7D	0.3D	SFM(Vc)	135	120	135	315	120	125	140	135	125
					IPT(fz)	.0004	.0006	.0010	.0017	.0023	.0026	.0033	.0034	.0035
					RPM	4080	2880	2040	1440	1200	960	720	600	480
					IPM(FEED)	3	4	4	5	6	5	5	4	3
	7	Low alloy steel	0.7D	0.3D	IPM(FEED)	80	70	80	185	65	70	80	80	70
					IPT(fz)	.0003	.0005	.0009	.0014	.0022	.0024	.0031	.0033	.0036
					RPM	2400	1680	1200	840	672	540	420	360	264
					IPM(FEED)	1	2	2	2	3	3	3	2	2
	8-9		0.7D	0.3D	SFM(Vc)	55	50	55	130	45	50	60	55	50
					IPT(fz)	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0036
					RPM	1680	1200	840	600	480	384	300	240	192
					IPM(FEED)	1	1	1	1	2	2	2	2	1
	10	High alloyed steel, and tool steel	0.7D	0.3D	IPM(FEED)	135	120	135	315	120	125	140	135	125
					IPT(fz)	.0004	.0006	.0010	.0017	.0023	.0026	.0033	.0034	.0035
					RPM	4080	2880	2040	1440	1200	960	720	600	480
					IPM(FEED)	3	4	4	5	6	5	5	4	3
	11.1		0.7D	0.3D	SFM(Vc)	55	50	55	130	45	50	60	55	50
					IPT(fz)	.0003	.0005	.0007	.0012	.0018	.0022	.0028	.0035	.0036
					RPM	1680	1200	840	600	480	384	300	240	192
					IPM(FEED)	1	1	1	1	2	2	2	2	1
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	IPM(FEED)	430	395	440	1045	375	395	470	440	410
					IPT(fz)	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038
					RPM	13200	9600	6720	4800	3840	3000	2400	1920	1560
					IPM(FEED)	11	12	13	17	17	16	14	13	12
	23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	430	395	440	1045	375	395	470	440	410
					IPT(fz)	.0004	.0006	.0010	.0017	.0022	.0027	.0030	.0034	.0038
					RPM	13200	9600	6720	4800	3840	3000	2400	1920	1560
					IPM(FEED)	11	12	13	17	17	16	14	13	12



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

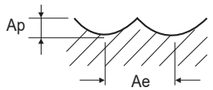
E2110, E1110, E2111 E1111, E2112, E1112 SERIES

TiCN Coated

2 FLUTE BALL NOSE - PROFILE MILLING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	5/32	1/4	5/6	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM(Vc)	190	170	185	455	165	170	170	155	170
					IPT(fz)	.0004	.0007	.0012	.0020	.0027	.0034	.0038	.0046	.0051
					RPM	5850	4160	2860	2080	1690	1300	1040	780	650
					IPM(FEED)	5	6	7	8	9	9	8	7	7
	2		0.7D	0.3D	SFM(Vc)	145	130	145	340	130	135	130	130	135
					IPT(fz)	.0004	.0006	.0010	.0017	.0023	.0025	.0033	.0034	.0035
					RPM	4420	3120	2210	1560	1300	1040	780	650	520
					IPM(FEED)	4	4	5	5	6	5	5	4	4
	3-4		0.7D	0.3D	SFM(Vc)	85	75	85	200	70	75	75	75	75
					IPT(fz)	.0003	.0005	.0009	.0014	.0021	.0025	.0032	.0033	.0037
					RPM	2600	1820	1300	910	730	590	460	390	290
					IPM(FEED)	2	2	2	3	3	3	3	3	2
	5		0.7D	0.3D	SFM(Vc)	60	55	60	140	50	55	55	50	55
					IPT(fz)	.0003	.0005	.0007	.0012	.0017	.0022	.0028	.0034	.0038
					RPM	1820	1300	910	650	520	420	330	260	210
					IPM(FEED)	1	1	1	2	2	2	2	2	2
	6	Low alloy steel	0.7D	0.3D	SFM(Vc)	145	130	145	340	130	135	130	130	135
					IPT(fz)	.0004	.0006	.0010	.0017	.0023	.0025	.0033	.0034	.0035
					RPM	4420	3120	2210	1560	1300	1040	780	650	520
					IPM(FEED)	4	4	5	5	6	5	5	4	4
	7		0.7D	0.3D	IPM(FEED)	85	75	85	200	70	75	75	75	75
					IPT(fz)	.0003	.0005	.0009	.0014	.0021	.0025	.0032	.0033	.0037
					RPM	2600	1820	1300	910	730	590	460	390	290
					IPM(FEED)	2	2	2	3	3	3	3	3	2
	8-9		0.7D	0.3D	SFM(Vc)	60	55	60	140	50	55	55	50	55
					IPT(fz)	.0003	.0005	.0007	.0012	.0017	.0022	.0028	.0034	.0038
					RPM	1820	1300	910	650	520	420	330	260	210
					IPM(FEED)	1	1	1	2	2	2	2	2	2
	10	High alloyed steel, and tool steel	0.7D	0.3D	IPM(FEED)	145	130	145	340	130	135	130	130	135
					IPT(fz)	.0004	.0006	.0010	.0017	.0023	.0025	.0033	.0034	.0035
					RPM	4420	3120	2210	1560	1300	1040	780	650	520
					IPM(FEED)	4	4	5	5	6	5	5	4	4
	11.1		0.7D	0.3D	SFM(Vc)	60	55	60	140	50	55	55	50	55
					IPT(fz)	.0003	.0005	.0007	.0012	.0017	.0022	.0028	.0034	.0038
					RPM	1820	1300	910	650	520	420	330	260	210
					IPM(FEED)	1	1	1	2	2	2	2	2	2
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	IPM(FEED)	470	425	475	1135	410	425	425	410	440
					IPT(fz)	.0004	.0006	.0008	.0017	.0022	.0027	.0029	.0036	.0038
					RPM	14300	10400	7280	5200	4160	3250	2600	2080	1690
					IPM(FEED)	12	13	12	18	19	17	15	15	13
	23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	470	425	475	1135	410	425	425	410	440
					IPT(fz)	.0004	.0006	.0008	.0017	.0022	.0027	.0029	.0036	.0038
					RPM	14300	10400	7280	5200	4160	3250	2600	2080	1690
					IPM(FEED)	12	13	12	18	19	17	15	15	13



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

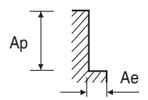
RECOMMENDED CUTTING CONDITIONS

E2031, E1031, E2034, E1034, E2036, E1036, E2051, E1051 E2039, E1039, E2040, E1040, E2041, E1041, E2053, E1053 SERIES

4 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1- 1/2	1 -3/4	2
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	115	120	110	120	115	125	105	125	120	120	130	145
					IPT(fz)	.0003	.0010	.0018	.0025	.0032	.0032	.0040	.0040	.0039	.0040	.0045	.0045
					RPM	3500	1800	1100	900	700	630	500	500	450	310	280	280
					IPM(FEED)	4	7	8	9	9	8	8	8	7	5	5	5
	2		0.1D	1.5D	SFM(Vc)	105	105	90	105	90	100	95	110	105	100	100	100
					IPT(fz)	.0002	.0009	.0017	.0022	.0027	.0030	.0033	.0033	.0038	.0040	.0045	.0053
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190
					IPM(FEED)	3	6	6	7	6	6	6	6	6	4	4	4
	3-4		0.1D	1.5D	SFM(Vc)	80	80	80	80	75	80	75	85	80	80	70	60
					IPT(fz)	.0002	.0008	.0016	.0020	.0022	.0025	.0029	.0029	.0032	.0025	.0033	.0045
					RPM	2500	1200	800	630	450	400	350	350	310	200	150	110
					IPM(FEED)	2	4	5	5	4	4	4	4	4	2	2	2
	5		0.1D	1.5D	SFM(Vc)	50	50	45	50	45	50	45	55	45	45	50	40
					IPT(fz)	.0002	.0006	.0017	.0019	.0027	.0030	.0034	.0034	.0028	.0021	.0023	.0031
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80
					IPM(FEED)	1	2	3	3	3	3	3	3	2	1	1	1
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	105	105	90	105	90	100	95	110	105	100	100	100
					IPT(fz)	.0002	.0009	.0017	.0022	.0027	.0030	.0033	.0033	.0038	.0040	.0045	.0053
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190
					IPM(FEED)	3	6	6	7	6	6	6	6	6	4	4	4
	7		0.1D	1.5D	IPM(FEED)	80	80	80	80	75	80	75	85	80	80	70	60
					IPT(fz)	.0002	.0008	.0016	.0020	.0022	.0025	.0029	.0029	.0032	.0025	.0033	.0045
					RPM	2500	1200	800	630	450	400	350	350	310	200	150	110
					IPM(FEED)	2	4	5	5	4	4	4	4	4	2	2	2
	8-9		0.1D	1.5D	SFM(Vc)	50	50	45	50	45	50	45	55	45	45	50	40
					IPT(fz)	.0002	.0006	.0017	.0019	.0027	.0030	.0034	.0034	.0028	.0021	.0023	.0031
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80
					IPM(FEED)	1	2	3	3	3	3	3	3	2	1	1	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	105	105	90	105	90	100	95	110	105	100	100	100
					IPT(fz)	.0002	.0009	.0017	.0022	.0027	.0030	.0033	.0033	.0038	.0040	.0045	.0053
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190
					IPM(FEED)	3	6	6	7	6	6	6	6	6	4	4	4
	11.1		0.1D	1.5D	SFM(Vc)	50	50	45	50	45	50	45	55	45	45	50	40
					IPT(fz)	.0002	.0006	.0017	.0019	.0027	.0030	.0034	.0034	.0028	.0021	.0023	.0031
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80
					IPM(FEED)	1	2	3	3	3	3	3	3	2	1	1	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	360	365	305	325	325	355	300	345	315	355	365	330
					IPT(fz)	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0038	.0048
					RPM	11000	5600	3100	2500	2000	1800	1400	1400	1200	900	800	630
					IPM(FEED)	15	19	24	22	21	21	18	18	17	13	12	12
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	360	365	305	325	325	355	300	345	315	355	365	330
					IPT(fz)	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0038	.0048
					RPM	11000	5600	3100	2500	2000	1800	1400	1400	1200	900	800	630
					IPM(FEED)	15	19	24	22	21	21	18	18	17	13	12	12



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

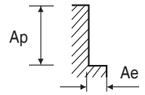
E2031, E1031, E2034, E1034, E2036, E1036, E2051, E1051 E2039, E1039, E2040, E1040, E2041, E1041, E2053, E1053 SERIES

TiN Coated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1- 1/2	1-3/4	2
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	135	140	130	140	135	150	130	145	140	145	155	175
					IPT(fz)	.0003	.0010	.0019	.0023	.0030	.0033	.0042	.0042	.0042	.0041	.0044	.0044
					RPM	4200	2160	1320	1080	840	760	600	600	540	370	340	340
					IPM(FEED)	5	9	10	10	10	10	10	10	9	6	6	6
	2		0.1D	1.5D	SFM(Vc)	125	125	105	125	110	120	115	135	125	120	120	120
					IPT(fz)	.0003	.0009	.0019	.0023	.0030	.0033	.0037	.0037	.0036	.0033	.0038	.0043
					RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230
					IPM(FEED)	4	7	8	9	8	8	8	8	7	4	4	4
	3-4		0.1D	1.5D	SFM(Vc)	100	95	95	100	90	95	90	105	95	95	80	70
					IPT(fz)	.0003	.0007	.0016	.0020	.0023	.0026	.0030	.0030	.0027	.0031	.0042	.0038
					RPM	3000	1440	960	760	540	480	420	420	370	240	180	130
					IPM(FEED)	3	4	6	6	5	5	5	5	4	3	3	2
	5		0.1D	1.5D	SFM(Vc)	65	65	55	65	55	60	55	65	55	55	60	50
					IPT(fz)	.0001	.0008	.0014	.0021	.0022	.0025	.0029	.0029	.0023	.0036	.0038	.0025
					RPM	1920	960	540	480	340	300	260	260	220	140	130	100
					IPM(FEED)	1	3	3	4	3	3	3	3	2	2	2	1
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	125	125	105	125	110	120	115	135	125	120	120	120
					IPT(fz)	.0003	.0009	.0019	.0023	.0030	.0033	.0037	.0037	.0036	.0033	.0038	.0043
					RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230
					IPM(FEED)	4	7	8	9	8	8	8	8	7	4	4	4
	7		0.1D	1.5D	IPM(FEED)	100	95	95	100	90	95	90	105	95	95	80	70
					IPT(fz)	.0003	.0007	.0016	.0020	.0023	.0026	.0030	.0030	.0027	.0031	.0042	.0038
					RPM	3000	1440	960	760	540	480	420	420	370	240	180	130
					IPM(FEED)	3	4	6	6	5	5	5	5	4	3	3	2
	8-9		0.1D	1.5D	SFM(Vc)	65	65	55	65	55	60	55	65	55	55	60	50
					IPT(fz)	.0001	.0008	.0014	.0021	.0022	.0025	.0029	.0029	.0023	.0036	.0038	.0025
					RPM	1920	960	540	480	340	300	260	260	220	140	130	100
					IPM(FEED)	1	3	3	4	3	3	3	3	2	2	2	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	125	125	105	125	110	120	115	135	125	120	120	120
					IPT(fz)	.0003	.0009	.0019	.0023	.0030	.0033	.0037	.0037	.0036	.0033	.0038	.0043
					RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230
					IPM(FEED)	4	7	8	9	8	8	8	8	7	4	4	4
	11.1		0.1D	1.5D	SFM(Vc)	65	65	55	65	55	60	55	65	55	55	60	50
					IPT(fz)	.0001	.0008	.0014	.0021	.0022	.0025	.0029	.0029	.0023	.0036	.0038	.0025
					RPM	1920	960	540	480	340	300	260	260	220	140	130	100
					IPM(FEED)	1	3	3	4	3	3	3	3	2	2	2	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	430	440	365	395	395	425	355	410	375	425	440	395
					IPT(fz)	.0003	.0008	.0019	.0023	.0026	.0029	.0031	.0031	.0035	.0037	.0036	.0046
					RPM	13200	6720	3720	3000	2400	2160	1680	1680	1440	1080	960	760
					IPM(FEED)	18	22	28	27	25	25	21	21	20	16	14	14
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	430	440	365	395	395	425	355	410	375	425	440	395
					IPT(fz)	.0003	.0008	.0019	.0023	.0026	.0029	.0031	.0031	.0035	.0037	.0036	.0046
					RPM	13200	6720	3720	3000	2400	2160	1680	1680	1440	1080	960	760
					IPM(FEED)	18	22	28	27	25	25	21	21	20	16	14	14



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

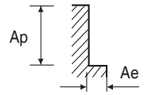
E2031, E1031, E2034, E1034, E2036, E1036, E2051, E1051 E2039, E1039, E2040, E1040, E2041, E1041, E2053, E1053 SERIES

TiCN Coated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

4 FLUTE - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1-1/2	1- 3/4	2
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	150	155	140	155	150	160	140	160	155	160	165	190
					IPT(fz)	.0003	.0010	.0017	.0024	.0030	.0030	.0038	.0038	.0038	.0038	.0042	.0042
					RPM	4550	2340	1430	1170	910	820	650	650	590	400	360	360
					IPM(FEED)	6	9	10	11	11	10	10	10	9	6	6	6
	2		0.1D	1.5D	SFM(Vc)	135	135	115	135	120	130	125	145	135	130	130	130
					IPT(fz)	.0002	.0008	.0017	.0022	.0027	.0031	.0034	.0034	.0034	.0038	.0043	.0050
					RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250
					IPM(FEED)	4	7	8	9	8	8	8	8	7	5	5	5
	3-4		0.1D	1.5D	SFM(Vc)	105	100	100	105	95	100	95	110	105	100	105	75
					IPT(fz)	.0002	.0008	.0014	.0018	.0021	.0024	.0027	.0027	.0031	.0029	.0033	.0036
					RPM	3250	1560	1040	820	590	520	460	460	400	260	230	140
					IPM(FEED)	3	5	6	6	5	5	5	5	5	3	3	2
	5		0.1D	1.5D	SFM(Vc)	70	70	55	70	60	65	60	70	60	60	65	55
					IPT(fz)	.0002	.0007	.0013	.0019	.0021	.0023	.0026	.0026	.0033	.0031	.0036	.0025
					RPM	2080	1040	590	520	360	330	290	290	230	160	140	100
					IPM(FEED)	2	3	3	4	3	3	3	3	3	2	2	1
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	135	135	115	135	120	130	125	145	135	130	130	130
					IPT(fz)	.0002	.0008	.0017	.0022	.0027	.0031	.0034	.0034	.0034	.0038	.0043	.0050
					RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250
					IPM(FEED)	4	7	8	9	8	8	8	8	7	5	5	5
	7		0.1D	1.5D	IPM(FEED)	105	100	100	105	95	100	95	110	105	100	105	75
					IPT(fz)	.0002	.0008	.0014	.0018	.0021	.0024	.0027	.0027	.0031	.0029	.0033	.0036
					RPM	3250	1560	1040	820	590	520	460	460	400	260	230	140
					IPM(FEED)	3	5	6	6	5	5	5	5	5	3	3	2
	8-9		0.1D	1.5D	SFM(Vc)	70	70	55	70	60	65	60	70	60	60	65	55
					IPT(fz)	.0002	.0007	.0013	.0019	.0021	.0023	.0026	.0026	.0033	.0031	.0036	.0025
					RPM	2080	1040	590	520	360	330	290	290	230	160	140	100
					IPM(FEED)	2	3	3	4	3	3	3	3	3	2	2	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	135	135	115	135	120	130	125	145	135	130	130	130
					IPT(fz)	.0002	.0008	.0017	.0022	.0027	.0031	.0034	.0034	.0034	.0038	.0043	.0050
					RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250
					IPM(FEED)	4	7	8	9	8	8	8	8	7	5	5	5
	11.1		0.1D	1.5D	SFM(Vc)	70	70	55	70	60	65	60	70	60	60	65	55
					IPT(fz)	.0002	.0007	.0013	.0019	.0021	.0023	.0026	.0026	.0033	.0031	.0036	.0025
					RPM	2080	1040	590	520	360	330	290	290	230	160	140	100
					IPM(FEED)	2	3	3	4	3	3	3	3	3	2	2	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	470	475	395	425	425	460	385	445	410	460	475	545
					IPT(fz)	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0036	.0036
					RPM	14300	7280	4030	3250	2600	2340	1820	1820	1560	1170	1040	1040
					IPM(FEED)	20	24	31	29	27	27	23	23	22	17	15	15
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	470	475	395	425	425	460	385	445	410	460	475	545
					IPT(fz)	.0003	.0008	.0019	.0022	.0026	.0029	.0032	.0032	.0035	.0036	.0036	.0036
					RPM	14300	7280	4030	3250	2600	2340	1820	1820	1560	1170	1040	1040
					IPM(FEED)	20	24	31	29	27	27	23	23	22	17	15	15



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

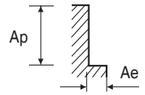
RECOMMENDED CUTTING CONDITIONS

E2032, E1032, E2035, E1035, E2037, E1037, E2042 E1042, E2162, E1162, E2175, E1175, E2100, E1100 SERIES

6&8 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1-1/2	1-3/4	2 (6&8 FL)
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	115	120	110	120	115	125	105	125	120	120	130	145
					IPT(fz)	.0002	.0006	.0012	.0017	.0021	.0021	.0027	.0027	.0026	.0027	.0030	.0030 / .0022
					RPM	3500	1800	1100	900	700	630	500	500	450	310	280	280
					IPM(FEED)	4	7	8	9	9	8	8	8	7	5	5	5
	2		0.1D	1.5D	SFM(Vc)	105	105	90	105	90	100	95	110	105	100	100	100
					IPT(fz)	.0002	.0006	.0011	.0015	.0018	.0020	.0022	.0022	.0025	.0027	.0030	.0035 / .0026
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190
					IPM(FEED)	3	6	6	7	6	6	6	6	6	4	4	4
	3-4		0.1D	1.5D	SFM(Vc)	80	80	80	80	75	80	75	85	80	80	70	60
					IPT(fz)	.0001	.0006	.0010	.0013	.0015	.0017	.0019	.0019	.0022	.0017	.0022	.0030 / .0023
					RPM	2500	1200	800	630	450	400	350	350	310	200	150	110
					IPM(FEED)	2	4	5	5	4	4	4	4	4	2	2	2
	5		0.1D	1.5D	SFM(Vc)	50	50	45	50	45	50	45	55	45	45	50	40
					IPT(fz)	.0001	.0004	.0011	.0013	.0018	.0020	.0023	.0023	.0019	.0014	.0015	.0021 / .0016
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80
					IPM(FEED)	1	2	3	3	3	3	3	3	2	1	1	1
	6		0.1D	1.5D	SFM(Vc)	105	105	90	105	90	100	95	110	105	100	100	100
					IPT(fz)	.0002	.0006	.0011	.0015	.0018	.0020	.0022	.0022	.0025	.0027	.0030	.0035 / .0026
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190
					IPM(FEED)	3	6	6	7	6	6	6	6	6	4	4	4
	7	Low alloy steel	0.1D	1.5D	IPM(FEED)	80	80	80	80	75	80	75	85	80	80	70	60
					IPT(fz)	.0001	.0006	.0010	.0013	.0015	.0017	.0019	.0019	.0022	.0017	.0022	.0030 / .0023
					RPM	2500	1200	800	630	450	400	350	350	310	200	150	110
					IPM(FEED)	2	4	5	5	4	4	4	4	4	2	2	2
	8-9		0.1D	1.5D	SFM(Vc)	50	50	45	50	45	50	45	55	45	45	50	40
					IPT(fz)	.0001	.0004	.0011	.0013	.0018	.0020	.0023	.0023	.0019	.0014	.0015	.0021 / .0016
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80
					IPM(FEED)	1	2	3	3	3	3	3	3	2	1	1	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	105	105	90	105	90	100	95	110	105	100	100	100
					IPT(fz)	.0002	.0006	.0011	.0015	.0018	.0020	.0022	.0022	.0025	.0027	.0030	.0035 / .0026
					RPM	3200	1600	900	800	560	500	450	450	400	250	220	190
					IPM(FEED)	3	6	6	7	6	6	6	6	6	4	4	4
	11.1		0.1D	1.5D	SFM(Vc)	50	50	45	50	45	50	45	55	45	45	50	40
					IPT(fz)	.0001	.0004	.0011	.0013	.0018	.0020	.0023	.0023	.0019	.0014	.0015	.0021 / .0016
					RPM	1600	800	450	400	280	250	220	220	180	120	110	80
					IPM(FEED)	1	2	3	3	3	3	3	3	2	1	1	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	360	365	305	325	325	355	300	345	315	355	365	330
					IPT(fz)	.0002	.0006	.0013	.0015	.0018	.0019	.0021	.0021	.0024	.0024	.0025	.0032 / .0024
					RPM	11000	5600	3100	2500	2000	1800	1400	1400	1200	900	800	630
					IPM(FEED)	15	19	24	22	21	21	18	18	17	13	12	12
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	360	365	305	325	325	355	300	345	315	355	365	330
					IPT(fz)	.0002	.0006	.0013	.0015	.0018	.0019	.0021	.0021	.0024	.0024	.0025	.0032 / .0024
					RPM	11000	5600	3100	2500	2000	1800	1400	1400	1200	900	800	630
					IPM(FEED)	15	19	24	22	21	21	18	18	17	13	12	12



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER&HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

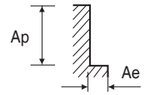
E2032, E1032, E2035, E1035, E2037, E1037, E2042 E1042, E2162, E1162, E2175, E1175, E2100, E1100 SERIES

TiN Coated

6&8 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1-1/2	1-3/4	2 (6&8 FL)
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	135	140	130	140	135	150	130	145	140	145	155	175
					IPT(fz)	.0002	.0007	.0013	.0015	.0020	.0022	.0028	.0028	.0028	.0027	.0029	.0029 / .0022
					RPM	4200	2160	1320	1080	840	760	600	600	540	370	340	340
					IPM(FEED)	5	9	10	10	10	10	10	10	9	6	6	6
	2		0.1D	1.5D	SFM(Vc)	125	125	105	125	110	120	115	135	125	120	120	120
					IPT(fz)	.0002	.0006	.0012	.0016	.0020	.0022	.0025	.0025	.0024	.0022	.0026	.0029 / .0022
					RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230
					IPM(FEED)	4	7	8	9	8	8	8	8	7	4	4	4
	3-4		0.1D	1.5D	SFM(Vc)	100	95	95	100	90	95	90	105	95	95	80	70
					IPT(fz)	.0002	.0005	.0010	.0013	.0015	.0017	.0020	.0020	.0018	.0021	.0028	.0026 / .0019
					RPM	3000	1440	960	760	540	480	420	420	370	240	180	130
					IPM(FEED)	3	4	6	6	5	5	5	5	4	3	3	2
	5		0.1D	1.5D	SFM(Vc)	65	65	55	65	55	60	55	65	55	55	60	50
					IPT(fz)	.0001	.0005	.0009	.0014	.0015	.0017	.0019	.0019	.0015	.0024	.0026	.0017 / .0013
					RPM	1920	960	540	480	340	300	260	260	220	140	130	100
					IPM(FEED)	1	3	3	4	3	3	3	3	2	2	2	1
	6		0.1D	1.5D	SFM(Vc)	125	125	105	125	110	120	115	135	125	120	120	120
					IPT(fz)	.0002	.0006	.0012	.0016	.0020	.0022	.0025	.0025	.0024	.0022	.0026	.0029 / .0022
					RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230
					IPM(FEED)	4	7	8	9	8	8	8	8	7	4	4	4
	7	Low alloy steel	0.1D	1.5D	IPM(FEED)	100	95	95	100	90	95	90	105	95	95	80	70
					IPT(fz)	.0002	.0005	.0010	.0013	.0015	.0017	.0020	.0020	.0018	.0021	.0028	.0026 / .0019
					RPM	3000	1440	960	760	540	480	420	420	370	240	180	130
					IPM(FEED)	3	4	6	6	5	5	5	5	4	3	3	2
	8-9		0.1D	1.5D	SFM(Vc)	65	65	55	65	55	60	55	65	55	55	60	50
					IPT(fz)	.0001	.0005	.0009	.0014	.0015	.0017	.0019	.0019	.0015	.0024	.0026	.0017 / .0013
					RPM	1920	960	540	480	340	300	260	260	220	140	130	100
					IPM(FEED)	1	3	3	4	3	3	3	3	2	2	2	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	125	125	105	125	110	120	115	135	125	120	120	120
					IPT(fz)	.0002	.0006	.0012	.0016	.0020	.0022	.0025	.0025	.0024	.0022	.0026	.0029 / .0022
					RPM	3840	1920	1080	960	670	600	540	540	480	300	260	230
					IPM(FEED)	4	7	8	9	8	8	8	8	7	4	4	4
	11.1		0.1D	1.5D	SFM(Vc)	65	65	55	65	55	60	55	65	55	55	60	50
					IPT(fz)	.0001	.0005	.0009	.0014	.0015	.0017	.0019	.0019	.0015	.0024	.0026	.0017 / .0013
					RPM	1920	960	540	480	340	300	260	260	220	140	130	100
					IPM(FEED)	1	3	3	4	3	3	3	3	2	2	2	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	430	440	365	395	395	425	355	410	375	425	440	395
					IPT(fz)	.0002	.0005	.0013	.0015	.0017	.0019	.0021	.0021	.0023	.0025	.0024	.0031 / .0023
					RPM	13200	6720	3720	3000	2400	2160	1680	1680	1440	1080	960	760
					IPM(FEED)	18	22	28	27	25	25	21	21	20	16	14	14
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	430	440	365	395	395	425	355	410	375	425	440	395
					IPT(fz)	.0002	.0005	.0013	.0015	.0017	.0019	.0021	.0021	.0023	.0025	.0024	.0031 / .0023
					RPM	13200	6720	3720	3000	2400	2160	1680	1680	1440	1080	960	760
					IPM(FEED)	18	22	28	27	25	25	21	21	20	16	14	14



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

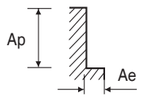
E2032, E1032, E2035, E1035, E2037, E1037, E2042 E1042, E2162, E1162, E2175, E1175, E2100, E1100 SERIES

TiCN Coated

6&8 FLUTE - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/8	1/4	3/8	1/2	5/8	3/4	13/16	15/16	1	1-1/2	1-3/4	2 (6&8 FL)
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	150	155	140	155	150	160	140	160	155	160	165	190
					IPT(fz)	.0002	.0006	.0012	.0016	.0020	.0020	.0026	.0026	.0025	.0025	.0028	.0028 / .0021
					RPM	4550	2340	1430	1170	910	820	650	650	590	400	360	360
					IPM(FEED)	6	9	10	11	11	10	10	10	9	6	6	6
	2		0.1D	1.5D	SFM(Vc)	135	135	115	135	120	130	125	145	135	130	130	130
					IPT(fz)	.0002	.0006	.0011	.0014	.0018	.0021	.0023	.0023	.0022	.0025	.0029	.0033 / .0025
					RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250
					IPM(FEED)	4	7	8	9	8	8	8	8	7	5	5	5
	3-4		0.1D	1.5D	SFM(Vc)	105	100	100	105	95	100	95	110	105	100	105	75
					IPT(fz)	.0002	.0005	.0010	.0012	.0014	.0016	.0018	.0018	.0021	.0019	.0022	.0024 / .0018
					RPM	3250	1560	1040	820	590	520	460	460	400	260	230	140
					IPM(FEED)	3	5	6	6	5	5	5	5	5	3	3	2
	5		0.1D	1.5D	SFM(Vc)	70	70	55	70	60	65	60	70	60	60	65	55
					IPT(fz)	.0002	.0005	.0008	.0013	.0014	.0015	.0017	.0017	.0022	.0021	.0024	.0017 / .0013
					RPM	2080	1040	590	520	360	330	290	290	230	160	140	100
					IPM(FEED)	2	3	3	4	3	3	3	3	3	2	2	1
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	135	135	115	135	120	130	125	145	135	130	130	130
					IPT(fz)	.0002	.0006	.0011	.0014	.0018	.0021	.0023	.0023	.0022	.0025	.0029	.0033 / .0025
					RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250
					IPM(FEED)	4	7	8	9	8	8	8	8	7	5	5	5
	7		0.1D	1.5D	IPM(FEED)	105	100	100	105	95	100	95	110	105	100	105	75
					IPT(fz)	.0002	.0005	.0010	.0012	.0014	.0016	.0018	.0018	.0021	.0019	.0022	.0024 / .0018
					RPM	3250	1560	1040	820	590	520	460	460	400	260	230	140
					IPM(FEED)	3	5	6	6	5	5	5	5	5	3	3	2
	8-9		0.1D	1.5D	SFM(Vc)	70	70	55	70	60	65	60	70	60	60	65	55
					IPT(fz)	.0002	.0005	.0008	.0013	.0014	.0015	.0017	.0017	.0022	.0021	.0024	.0017 / .0013
					RPM	2080	1040	590	520	360	330	290	290	230	160	140	100
					IPM(FEED)	2	3	3	4	3	3	3	3	3	2	2	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	135	135	115	135	120	130	125	145	135	130	130	130
					IPT(fz)	.0002	.0006	.0011	.0014	.0018	.0021	.0023	.0023	.0022	.0025	.0029	.0033 / .0025
					RPM	4160	2090	1170	1040	730	650	590	590	520	330	290	250
					IPM(FEED)	4	7	8	9	8	8	8	8	7	5	5	5
	11.1		0.1D	1.5D	SFM(Vc)	70	70	55	70	60	65	60	70	60	60	65	55
					IPT(fz)	.0002	.0005	.0008	.0013	.0014	.0015	.0017	.0017	.0022	.0021	.0024	.0017 / .0013
					RPM	2080	1040	590	520	360	330	290	290	230	160	140	100
					IPM(FEED)	2	3	3	4	3	3	3	3	3	2	2	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	470	475	395	425	425	460	385	445	410	460	475	545
					IPT(fz)	.0002	.0005	.0013	.0015	.0017	.0019	.0021	.0021	.0024	.0024	.0024	.0024 / .0018
					RPM	14300	7280	4030	3250	2600	2340	1820	1820	1560	1170	1040	1040
					IPM(FEED)	20	24	31	29	27	27	23	23	22	17	15	15
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	470	475	395	425	425	460	385	445	410	460	475	545
					IPT(fz)	.0002	.0005	.0013	.0015	.0017	.0019	.0021	.0021	.0024	.0024	.0024	.0024 / .0018
					RPM	14300	7280	4030	3250	2600	2340	1820	1820	1560	1170	1040	1040
					IPM(FEED)	20	24	31	29	27	27	23	23	22	17	15	15



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

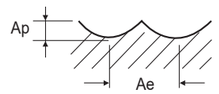
RECOMMENDED CUTTING CONDITIONS

E2020, E2021, E2069 SERIES

4 FLUTE BALL NOSE - PROFILE MILLING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM(Vc)	145	130	130	130	130	120	130
					IPT(fz)	.0009	.0014	.0021	.0025	.0028	.0033	.0040
					RPM	2200	1600	1300	1000	800	600	500
					IPM(FEED)	8	9	11	10	9	8	8
	2		0.7D	0.3D	SFM(Vc)	110	100	100	105	100	100	105
					IPT(fz)	.0007	.0013	.0018	.0019	.0025	.0025	.0025
					RPM	1700	1200	1000	800	600	500	400
					IPM(FEED)	5	6	7	6	6	5	4
	3-4		0.7D	0.3D	SFM(Vc)	65	55	55	60	55	60	60
					IPT(fz)	.0008	.0011	.0018	.0017	.0021	.0025	.0023
					RPM	1000	700	560	450	350	300	220
					IPM(FEED)	3	3	4	3	3	3	2
	5		0.7D	0.3D	SFM(Vc)	45	40	40	40	40	40	40
					IPT(fz)	.0007	.0010	.0013	.0016	.0020	.0025	.0031
					RPM	700	500	400	320	250	200	160
					IPM(FEED)	2	2	2	2	2	2	2
	6	Low alloy steel	0.7D	0.3D	SFM(Vc)	110	100	100	105	100	100	105
					IPT(fz)	.0007	.0013	.0018	.0019	.0025	.0025	.0025
					RPM	1700	1200	1000	800	600	500	400
					IPM(FEED)	5	6	7	6	6	5	4
	7		0.7D	0.3D	IPM(FEED)	65	55	55	60	55	60	60
					IPT(fz)	.0008	.0011	.0018	.0017	.0021	.0025	.0023
					RPM	1000	700	560	450	350	300	220
					IPM(FEED)	3	3	4	3	3	3	2
	8-9		0.7D	0.3D	SFM(Vc)	45	40	40	40	40	40	40
					IPT(fz)	.0007	.0010	.0013	.0016	.0020	.0025	.0031
					RPM	700	500	400	320	250	200	160
					IPM(FEED)	2	2	2	2	2	2	2
	10	High alloyed steel, and tool steel	0.7D	0.3D	IPM(FEED)	110	100	100	105	100	100	105
					IPT(fz)	.0007	.0013	.0018	.0019	.0025	.0025	.0025
					RPM	1700	1200	1000	800	600	500	400
					IPM(FEED)	5	6	7	6	6	5	4
	11.1		0.7D	0.3D	SFM(Vc)	45	40	40	40	40	40	40
					IPT(fz)	.0007	.0010	.0013	.0016	.0020	.0025	.0031
					RPM	700	500	400	320	250	200	160
					IPM(FEED)	2	2	2	2	2	2	2
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	IPM(FEED)	365	325	315	325	325	315	340
					IPT(fz)	.0008	.0013	.0016	.0020	.0023	.0027	.0029
					RPM	5600	4000	3200	2500	2000	1600	1300
					IPM(FEED)	17	21	21	20	18	17	15
	23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	365	325	315	325	325	315	340
					IPT(fz)	.0008	.0013	.0016	.0020	.0023	.0027	.0029
					RPM	5600	4000	3200	2500	2000	1600	1300
					IPM(FEED)	17	21	21	20	18	17	15



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

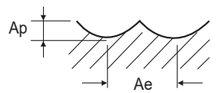
RECOMMENDED CUTTING CONDITIONS

E2020, E2021, E2069 SERIES — TiN Coated

4 FLUTE BALL NOSE - PROFILE MILLING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM(Vc)	175	155	155	155	155	140	155
					IPT(fz)	.0009	.0014	.0021	.0025	.0029	.0035	.0042
					RPM	2640	1920	1560	1200	960	720	600
					IPM(FEED)	10	11	13	12	11	10	10
	2		0.7D	0.3D	SFM(Vc)	135	120	120	125	120	120	125
					IPT(fz)	.0007	.0014	.0019	.0021	.0024	.0025	.0026
					RPM	2040	1440	1200	960	720	600	480
					IPM(FEED)	6	8	9	8	7	6	5
	3-4		0.7D	0.3D	SFM(Vc)	80	70	65	70	70	70	70
					IPT(fz)	.0006	.0012	.0015	.0019	.0024	.0028	.0029
					RPM	1200	840	670	540	420	360	260
					IPM(FEED)	3	4	4	4	4	4	3
	5		0.7D	0.3D	SFM(Vc)	55	50	45	50	50	45	50
					IPT(fz)	.0006	.0008	.0010	.0013	.0017	.0021	.0026
					RPM	840	600	480	380	300	240	190
					IPM(FEED)	2	2	2	2	2	2	2
	6	Low alloy steel	0.7D	0.3D	IPM(FEED)	135	120	120	125	120	120	125
					IPT(fz)	.0007	.0014	.0019	.0021	.0024	.0025	.0026
					RPM	2040	1440	1200	960	720	600	480
					IPM(FEED)	6	8	9	8	7	6	5
	7		0.7D	0.3D	IPM(FEED)	80	70	65	70	70	70	70
					IPT(fz)	.0006	.0012	.0015	.0019	.0024	.0028	.0029
					RPM	1200	840	670	540	420	360	260
					IPM(FEED)	3	4	4	4	4	4	3
	8-9		0.7D	0.3D	SFM(Vc)	55	50	45	50	50	45	50
					IPT(fz)	.0006	.0008	.0010	.0013	.0017	.0021	.0026
					RPM	840	600	480	380	300	240	190
					IPM(FEED)	2	2	2	2	2	2	2
	10	High alloyed steel, and tool steel	0.7D	0.3D	IPM(FEED)	135	120	120	125	120	120	125
					IPT(fz)	.0007	.0014	.0019	.0021	.0024	.0025	.0026
					RPM	2040	1440	1200	960	720	600	480
					IPM(FEED)	6	8	9	8	7	6	5
	11.1		0.7D	0.3D	SFM(Vc)	55	50	45	50	50	45	50
					IPT(fz)	.0006	.0008	.0010	.0013	.0017	.0021	.0026
					RPM	840	600	480	380	300	240	190
					IPM(FEED)	2	2	2	2	2	2	2
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	IPM(FEED)	440	395	375	395	395	375	410
					IPT(fz)	.0007	.0013	.0017	.0020	.0022	.0026	.0029
					RPM	6720	4800	3840	3000	2400	1920	1560
					IPM(FEED)	20	25	26	24	21	20	18
	23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	440	395	375	395	395	375	410
					IPT(fz)	.0007	.0013	.0017	.0020	.0022	.0026	.0029
					RPM	6720	4800	3840	3000	2400	1920	1560
					IPM(FEED)	20	25	26	24	21	20	18



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

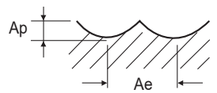
RECOMMENDED CUTTING CONDITIONS

E2020, E2021, E2069 SERIES — TiCN Coated

4 FLUTE BALL NOSE - PROFILE MILLING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	1
P	1	Non-alloy steel	0.7D	0.3D	SFM(Vc)	185	170	165	170	170	155	170
					IPT(fz)	.0009	.0014	.0021	.0025	.0029	.0035	.0038
					RPM	2860	2080	1690	1300	1040	780	650
					IPM(FEED)	10	12	14	13	12	11	10
	2		0.7D	0.3D	SFM(Vc)	145	130	130	135	130	130	135
					IPT(fz)	.0008	.0013	.0017	.0019	.0026	.0027	.0024
					RPM	2210	1560	1300	1040	780	650	520
					IPM(FEED)	7	8	9	8	8	7	5
	3-4		0.7D	0.3D	SFM(Vc)	85	75	70	75	75	75	75
					IPT(fz)	.0008	.0011	.0017	.0017	.0022	.0026	.0026
					RPM	1300	910	730	590	460	390	290
					IPM(FEED)	4	4	5	4	4	4	3
	5		0.7D	0.3D	SFM(Vc)	60	55	50	55	55	50	55
					IPT(fz)	.0005	.0008	.0014	.0018	.0023	.0029	.0024
					RPM	910	650	520	420	330	260	210
					IPM(FEED)	2	2	3	3	3	3	2
	6	Low alloy steel	0.7D	0.3D	SFM(Vc)	145	130	130	135	130	130	135
					IPT(fz)	.0008	.0013	.0017	.0019	.0026	.0027	.0024
					RPM	2210	1560	1300	1040	780	650	520
					IPM(FEED)	7	8	9	8	8	7	5
	7		0.7D	0.3D	IPM(FEED)	85	75	70	75	75	75	75
					IPT(fz)	.0008	.0011	.0017	.0017	.0022	.0026	.0026
					RPM	1300	910	730	590	460	390	290
					IPM(FEED)	4	4	5	4	4	4	3
	8-9		0.7D	0.3D	SFM(Vc)	60	55	50	55	55	50	55
					IPT(fz)	.0005	.0008	.0014	.0018	.0023	.0029	.0024
					RPM	910	650	520	420	330	260	210
					IPM(FEED)	2	2	3	3	3	3	2
	10	High alloyed steel, and tool steel	0.7D	0.3D	IPM(FEED)	145	130	130	135	130	130	135
					IPT(fz)	.0008	.0013	.0017	.0019	.0026	.0027	.0024
					RPM	2210	1560	1300	1040	780	650	520
					IPM(FEED)	7	8	9	8	8	7	5
	11.1		0.7D	0.3D	SFM(Vc)	60	55	50	55	55	50	55
					IPT(fz)	.0005	.0008	.0014	.0018	.0023	.0029	.0024
					RPM	910	650	520	420	330	260	210
					IPM(FEED)	2	2	3	3	3	3	2
N	21-22	Aluminum-wrought alloy	0.7D	0.3D	IPM(FEED)	475	425	410	425	425	410	440
					IPT(fz)	.0008	.0013	.0017	.0020	.0022	.0026	.0030
					RPM	7280	5200	4160	3250	2600	2080	1690
					IPM(FEED)	22	27	28	26	23	22	20
	23-25	Aluminum-cast, alloyed	0.7D	0.3D	SFM(Vc)	475	425	410	425	425	410	440
					IPT(fz)	.0008	.0013	.0017	.0020	.0022	.0026	.0030
					RPM	7280	5200	4160	3250	2600	2080	1690
					IPM(FEED)	22	27	28	26	23	22	20



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

E2001, E1001, E2003, E1003, E2005, E1005, E2002, E1002, E2004 E1004, E2006, E1006, E2008, E1008, E2013, E1013, E2015, E1015 SERIES

MINIATURE

SFM(Vc) = ft./min. IPT(fz) = in./tooth
RPM = rev./min. IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 1/64	1/32	3/64	1/16	5/64	3/32	7/64	1/8	9/64	5/32	11/64	3/16
P	1-5	Non-alloy steel Low alloy steel	SFM(Vc)	45	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55
			RPM	11000 up	5500~5600	3670~4400	2750~3300	2200~2640	1840~2200	1570~1890	1380~1650	1220~1470	1100~1320	1000~1200	920~1100
			IPM(FEED)	0.5	0.6	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.4
	6-9	Low alloy steel	SFM(Vc)	45	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55
			RPM	11000 up	5500~5600	3670~4400	2750~3300	2200~2640	1840~2200	1570~1890	1380~1650	1220~1470	1100~1320	1000~1200	920~1100
			IPM(FEED)	0.5	0.6	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.4
	10-11	High alloyed steel, and tool steel	SFM(Vc)	25~35	25~35	25~35	25~35	25~35	25~30	25~35	25~35	25~35	25~35	25~35	25~35
			RPM	6600~8800	3300~4400	2200~2940	1650~2260	1320~1760	1100~1290	850~1260	830~1100	740~980	560~880	600~800	550~740
			IPM(FEED)	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	1.0
M	12-14	Stainless steel	SFM(Vc)	25~35	25~35	25~35	25~35	25~35	25~30	25~35	25~35	25~35	25~35	25~35	25~35
			RPM	6600~8800	3300~4400	2200~2940	1650~2260	1320~1760	1100~1290	850~1260	830~1100	740~980	560~880	600~800	550~740
			IPM(FEED)	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	1.0
N	21-22	Aluminum-wrought alloy	SFM(Vc)	45	90	135	180	175	180	160	180	180~360	180~360	180~360	180~360
			RPM	11000 up	11000 up	11000 up	11000 up	8500 up	7330 up	5625 up	5500 up	4890~9780	4400~8800	3000~8000	3690~7340
			IPM(FEED)	1.5	2.5	2.6	4.2	4.2	4.2	4.3	4.5	4.5	4.5	4.6	4.7
	23-25	Aluminum-cast, alloyed	SFM(Vc)	45	90	135	180	175	180	160	180	180~360	180~360	180~360	180~360
			RPM	11000 up	11000 up	11000 up	11000 up	8500 up	7330 up	5625 up	5500 up	4890~9780	4400~8800	3000~8000	3690~7340
			IPM(FEED)	1.5	2.5	2.6	4.2	4.2	4.2	4.3	4.5	4.5	4.5	4.6	4.7
	26-28	Copper and Copper Alloys (Bronze / Brass)	SFM(Vc)	45	65~80	65~80	55~80	80	65~80	65~80	65~80	65~80	65~80	65~80	65~80
			RPM	11000 up	7700~9900	5140~6600	3350~4950	3850~3960	2570~3300	2200~2830	1930~2480	1710~2200	1540~1980	1400~1800	1290~1650
			IPM(FEED)	0.8	1.6	2.5	3.3	3.3	3.3	3.3	3.3	3.4	3.6	3.7	3.3
	30	Non Metallic Materials	SFM(Vc)	45	90	90~110	90~110	90~120	90~110	90~110	90~110	90~140	90~110	90~110	75~110
			RPM	11000 up	11000 up	7335~8800	5500~6600	4400~5820	3665~4400	3140~3770	2750~3300	2445~3770	2205~2640	2000~2400	1535~2200
			IPM(FEED)	1.2	1.6	2.0	2.6	2.6	2.6	2.6	2.8	2.8	2.9	3.0	3.3
S	36	Titanium Alloys	SFM(Vc)	45	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55	45~55
			RPM	11000 up	5500~5600	3670~4400	2750~3300	2200~2640	1840~2200	1570~1890	1380~1650	1220~1470	1100~1320	1000~1200	920~1100
			IPM(FEED)	0.5	0.6	0.6	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.4
	37		SFM(Vc)	25~35	25~35	25~35	25~35	25~35	25~30	25~35	25~35	25~35	25~35	25~35	25~35
			RPM	6600~8800	3300~4400	2200~2940	1650~2260	1320~1760	1100~1290	850~1260	830~1100	740~980	560~880	600~800	550~740
			IPM(FEED)	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.9	1.0

※ The Feed, in long & extra long types, should be reduced by around 50%.

NOTES :

(1) The cutting conditions in this table are given for reference, which should be varied depending on the machine, tooling, depth of cut. cutting fluid and other conditons.
(2) Use a holder of strong gripping force and machine of high stiffness

COBALT & HSS END MILLS

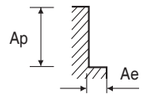
RECOMMENDED CUTTING CONDITIONS

E2086, E2085, E2079, E2077, E2170 E2171, E2172, E2241, E2195, E2197 SERIES

MULTI FLUTE ROUGHING - SIDE CUTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	11/16	7/8	1	1-1/8	1-1/4	1-3/8	1-3/4	2
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	120	115	110	120	115	115	115	120	120	115	110	130	115
					RPM	1800	1400	1100	900	700	630	500	450	400	350	310	280	220
					IPM(FEED)	3	4	6	7	7	7	9	9	8	8	8	8	8
	2		0.5D	1.5D	SFM(Vc)	105	90	90	105	90	90	105	105	105	90	90	100	95
					RPM	1600	1100	900	800	560	500	450	400	350	280	250	220	180
					IPM(FEED)	2	3	5	6	6	6	7	7	6	6	6	6	7
	3-4		0.5D	1.5D	SFM(Vc)	80	75	80	80	75	70	80	80	80	70	70	80	85
					RPM	1200	900	800	630	450	400	350	310	280	220	200	180	160
					IPM(FEED)	2	3	4	4	4	4	6	6	5	5	5	5	6
	5		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45	45	50	45
					RPM	800	560	450	400	280	250	220	180	160	140	120	110	90
					IPM(FEED)	1	1	2	3	3	3	3	3	3	3	3	3	3
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	105	90	90	105	90	90	105	105	105	90	90	100	95
					RPM	1600	1100	900	800	560	500	450	400	350	280	250	220	180
					IPM(FEED)	2	3	5	6	6	6	7	7	6	6	6	6	7
	7		0.5D	1.5D	SFM(Vc)	80	75	80	80	75	70	80	80	80	70	70	80	85
					RPM	1200	900	800	630	450	400	350	310	280	220	200	180	160
					IPM(FEED)	2	3	4	4	4	4	6	6	5	5	5	5	6
	8-9		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45	45	50	45
					RPM	800	560	450	400	280	250	220	180	160	140	120	110	90
					IPM(FEED)	1	1	2	3	3	3	3	3	3	3	3	3	3
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	105	90	90	105	90	90	105	105	105	90	90	100	95
					RPM	1600	1100	900	800	560	500	450	400	350	280	250	220	180
					IPM(FEED)	2	3	5	6	6	6	7	7	6	6	6	6	7
	11.1		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45	45	50	45
					RPM	800	560	450	400	280	250	220	180	160	140	120	110	90
					IPM(FEED)	1	1	2	3	3	3	3	3	3	3	3	3	3
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM(Vc)	295	255	245	260	260	250	250	260	265	260	250	290	260
					RPM	4500	3100	2500	2000	1600	1400	1100	1000	900	800	700	630	500
					IPM(FEED)	8	9	14	16	18	19	19	18	20	20	19	18	15
	23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	295	255	245	260	260	250	250	260	265	260	250	290	260
					RPM	4500	3100	2500	2000	1600	1400	1100	1000	900	800	700	630	500
					IPM(FEED)	8	9	14	16	18	19	19	18	20	20	19	18	15



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

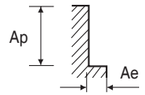
E2086, E2085, E2079, E2077, E2170 E2171, E2172, E2241, E2195, E2197 SERIES

TiN Coated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

MULTI FLUTE ROUGHING - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	11/16	7/8	1	1-1/8	1-1/4	1-3/8	1-3/4	2
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	140	135	130	140	135	135	135	140	140	135	135	155	140
					RPM	2160	1680	1320	1080	840	760	600	540	480	420	370	340	260
					IPM(FEED)	4	5	7	9	9	9	10	10	10	10	10	10	10
	2		0.5D	1.5D	SFM(Vc)	125	110	105	125	110	110	125	125	125	110	110	120	115
					RPM	1920	1320	1080	960	670	600	540	480	420	340	300	260	220
					IPM(FEED)	3	4	6	7	7	7	8	8	8	8	8	7	8
	3-4		0.5D	1.5D	SFM(Vc)	95	90	95	100	90	85	95	95	100	85	85	100	100
					RPM	1440	1080	960	760	540	480	420	370	340	260	240	220	190
					IPM(FEED)	3	3	5	5	5	5	7	7	6	6	6	6	7
	5		0.5D	1.5D	SFM(Vc)	65	55	55	65	55	55	60	55	55	55	50	60	55
					RPM	960	670	540	480	340	300	260	220	190	170	140	130	110
					IPM(FEED)	1	2	3	3	3	3	4	4	4	4	4	4	4
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	125	110	105	125	110	110	125	125	125	110	110	120	115
					RPM	1920	1320	1080	960	670	600	540	480	420	340	300	260	220
					IPM(FEED)	3	4	6	7	7	7	8	8	8	8	8	7	8
	7		0.5D	1.5D	SFM(Vc)	95	90	95	100	90	85	95	95	100	85	85	100	100
					RPM	1440	1080	960	760	540	480	420	370	340	260	240	220	190
					IPM(FEED)	3	3	5	5	5	5	7	7	6	6	6	6	7
	8-9		0.5D	1.5D	SFM(Vc)	65	55	55	65	55	55	60	55	55	55	50	60	55
					RPM	960	670	540	480	340	300	260	220	190	170	140	130	110
					IPM(FEED)	1	2	3	3	3	3	4	4	4	4	4	4	4
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	125	110	105	125	110	110	125	125	125	110	110	120	115
					RPM	1920	1320	1080	960	670	600	540	480	420	340	300	260	220
					IPM(FEED)	3	4	6	7	7	7	8	8	8	8	8	7	8
	11.1		0.5D	1.5D	SFM(Vc)	65	55	55	65	55	55	60	55	55	55	50	60	55
					RPM	960	670	540	480	340	300	260	220	190	170	140	130	110
					IPM(FEED)	1	2	3	3	3	3	4	4	4	4	4	4	4
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM(Vc)	355	305	295	315	315	300	300	315	320	315	300	345	315
					RPM	5400	3720	3000	2400	1920	1680	1320	1200	1080	960	840	760	600
					IPM(FEED)	10	11	17	19	21	22	22	21	24	24	22	21	18
	23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	355	305	295	315	315	300	300	315	320	315	300	345	315
					RPM	5400	3720	3000	2400	1920	1680	1320	1200	1080	960	840	760	600
					IPM(FEED)	10	11	17	19	21	22	22	21	24	24	22	21	18



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

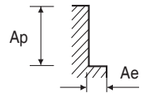
E2086, E2085, E2079, E2077, E2170 E2171, E2172, E2241, E2195, E2197 SERIES

TiCN Coated

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

MULTI FLUTE ROUGHING - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	11/16	7/8	1	1-1/8	1-1/4	1-3/8	1-3/4	2
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	155	150	140	155	150	145	150	155	155	150	145	165	150
					RPM	2340	1820	1430	1170	910	820	650	590	520	460	400	360	290
					IPM(FEED)	4	5	8	9	9	9	11	11	11	11	11	10	10
	2		0.5D	1.5D	SFM(Vc)	135	115	115	135	120	115	135	135	135	120	115	130	125
					RPM	2080	1430	1170	1040	730	650	590	520	460	360	330	290	230
					IPM(FEED)	3	4	6	7	7	7	9	9	8	8	8	8	9
	3-4		0.5D	1.5D	SFM(Vc)	100	95	100	105	95	95	105	105	105	95	95	105	110
					RPM	1560	1170	1040	820	590	520	460	400	360	290	260	230	210
					IPM(FEED)	3	3	6	6	6	6	7	7	7	7	7	6	7
	5		0.5D	1.5D	SFM(Vc)	70	60	55	70	60	60	65	60	60	60	55	65	60
					RPM	1040	730	590	520	360	330	290	230	210	180	160	140	120
					IPM(FEED)	2	2	3	4	4	4	4	4	4	4	4	4	4
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	135	115	115	135	120	115	135	135	135	120	115	130	125
					RPM	2080	1430	1170	1040	730	650	590	520	460	360	330	290	230
					IPM(FEED)	3	4	6	7	7	7	9	9	8	8	8	8	9
	7		0.5D	1.5D	SFM(Vc)	100	95	100	105	95	95	105	105	105	95	95	105	110
					RPM	1560	1170	1040	820	590	520	460	400	360	290	260	230	210
					IPM(FEED)	3	3	6	6	6	6	7	7	7	7	7	6	7
	8-9		0.5D	1.5D	SFM(Vc)	70	60	55	70	60	60	65	60	60	60	55	65	60
					RPM	1040	730	590	520	360	330	290	230	210	180	160	140	120
					IPM(FEED)	2	2	3	4	4	4	4	4	4	4	4	4	4
	10	High alloyed steel, and tool steel	0.5D	1.5D	SFM(Vc)	135	115	115	135	120	115	135	135	135	120	115	130	125
					RPM	2080	1430	1170	1040	730	650	590	520	460	360	330	290	230
					IPM(FEED)	3	4	6	7	7	7	9	9	8	8	8	8	9
	11.1		0.5D	1.5D	SFM(Vc)	70	60	55	70	60	60	65	60	60	60	55	65	60
					RPM	1040	730	590	520	360	330	290	230	210	180	160	140	120
					IPM(FEED)	2	2	3	4	4	4	4	4	4	4	4	4	4
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	SFM(Vc)	385	330	320	340	340	330	330	340	345	340	330	375	340
					RPM	5850	4030	3250	2600	2080	1820	1430	1300	1170	1040	910	820	650
					IPM(FEED)	10	12	18	21	23	24	24	23	26	26	24	23	19
	23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	385	330	320	340	340	330	330	340	345	340	330	375	340
					RPM	5850	4030	3250	2600	2080	1820	1430	1300	1170	1040	910	820	650
					IPM(FEED)	10	12	18	21	23	24	24	23	26	26	24	23	19



※ The Feed, in long & extra long types, should be reduced by around 50%.

CARBIDE
HSS
CBN END MILLS
i-Xmill END MILLS
i-SMART MODULAR END MILLS
X1-EH END MILLS
X5070 END MILLS
4G MILL END MILLS
X-POWER PRO END MILLS
TitaNox-POWER& HPC END MILLS
JET-POWER END MILLS
V7 PLUS A END MILLS
V7 MILL INOX
ALU-POWER HPC END MILLS
ALU-POWER END MILLS
D-POWER GRAPHITE END MILLS
STANDARD CARBIDE
ONLY ONE COATED PM60 END MILLS
SINE-POWER
TANK-POWER END MILLS
STANDARD COBALT & HSS
TECHNICAL DATA

COBALT & HSS END MILLS

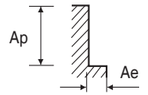
RECOMMENDED CUTTING CONDITIONS

E2193, E2125 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

MULTI FLUTE BALL ROUGHING - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 5/16	3/8	1/2	5/8	3/4	1	1-1/4	1-3/4
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	115	110	120	115	110	120	115	130
					IPT(fz)	.0010	.0014	.0019	.0025	.0031	.0040	.0038	.0048
					RPM	1400	1100	900	700	560	450	350	280
					IPM(FEED)	4	6	7	7	7	9	8	8
	2		0.5D	1.5D	SFM(Vc)	90	90	105	90	90	105	90	100
					IPT(fz)	.0009	.0014	.0019	.0027	.0033	.0035	.0036	.0045
					RPM	1100	900	800	560	450	400	280	220
					IPM(FEED)	3	5	6	6	6	7	6	6
	3-4		0.5D	1.5D	SFM(Vc)	75	80	80	75	80	80	70	80
					IPT(fz)	.0011	.0013	.0016	.0022	.0025	.0039	.0038	.0046
					RPM	900	800	630	450	400	310	220	180
					IPM(FEED)	3	4	4	4	4	6	5	5
	5		0.5D	1.5D	SFM(Vc)	45	45	50	45	45	45	45	50
					IPT(fz)	.0006	.0011	.0019	.0027	.0034	.0033	.0036	.0045
					RPM	560	450	400	280	220	180	140	110
					IPM(FEED)	1	2	3	3	3	3	3	3
	6	Low alloy steel	0.5D	1.5D	IPM(FEED)	90	90	105	90	90	105	90	100
					IPT(fz)	.0009	.0014	.0019	.0027	.0033	.0035	.0036	.0045
					RPM	1100	900	800	560	450	400	280	220
					IPM(FEED)	3	5	6	6	6	7	6	6
	7		0.5D	1.5D	IPM(FEED)	75	80	80	75	80	80	70	80
					IPT(fz)	.0011	.0013	.0016	.0022	.0025	.0039	.0038	.0046
					RPM	900	800	630	450	400	310	220	180
					IPM(FEED)	3	4	4	4	4	6	5	5
	8-9		0.5D	1.5D	SFM(Vc)	45	45	50	45	45	45	45	50
					IPT(fz)	.0006	.0011	.0019	.0027	.0034	.0033	.0036	.0045
					RPM	560	450	400	280	220	180	140	110
					IPM(FEED)	1	2	3	3	3	3	3	3
	10	High alloyed steel, and tool steel	0.5D	1.5D	IPM(FEED)	90	90	105	90	90	105	90	100
					IPT(fz)	.0009	.0014	.0019	.0027	.0033	.0035	.0036	.0045
					RPM	1100	900	800	560	450	400	280	220
					IPM(FEED)	3	5	6	6	6	7	6	6
	11.1		0.5D	1.5D	SFM(Vc)	45	45	50	45	45	45	45	50
					IPT(fz)	.0006	.0011	.0019	.0027	.0034	.0033	.0036	.0045
					RPM	560	450	400	280	220	180	140	110
					IPM(FEED)	1	2	3	3	3	3	3	3
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	IPM(FEED)	255	245	260	260	235	260	260	290
					IPT(fz)	.0010	.0010	.0020	.0028	.0042	.0036	.0042	.0048
					RPM	3100	2500	2000	1600	1200	1000	800	630
					IPM(FEED)	9	10	16	18	20	18	20	18
	23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	255	245	260	260	235	260	260	290
					IPT(fz)	.0010	.0010	.0020	.0028	.0042	.0036	.0042	.0048
					RPM	3100	2500	2000	1600	1200	1000	800	630
					IPM(FEED)	9	10	16	18	20	18	20	18



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

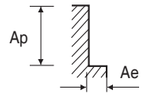
RECOMMENDED CUTTING CONDITIONS

E2248 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

MULTI FLUTE ROUGHING & FINISHING - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	11/16	7/8	1	1-1/4	1-3/8	2 (6&8 FL)
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	120	115	110	120	115	115	115	120	115	110	125
					IPT(fz)	.0004	.0005	.0011	.0017	.0021	.0024	.0028	.0031	.0033	.0038	.0035/ .0026
					RPM	1800	1400	1100	900	700	630	500	450	350	310	240
					IPM(FEED)	3	3	5	6	6	6	7	7	7	7	5
	2		0.5D	1.5D	SFM(Vc)	85	90	90	105	90	90	105	105	90	90	100
					IPT(fz)	.0004	.0005	.0011	.0013	.0018	.0020	.0022	.0025	.0030	.0033	.0035 / .0026
					RPM	1300	1100	900	800	560	500	450	400	280	250	190
					IPM(FEED)	2	2	4	4	4	4	5	5	5	5	4
	3-4		0.5D	1.5D	SFM(Vc)	80	75	80	80	75	70	80	80	70	70	80
					IPT(fz)	.0004	.0006	.0013	.0016	.0022	.0025	.0023	.0026	.0030	.0033	.0033 / .0025
					RPM	1200	900	800	630	450	400	350	310	220	200	150
					IPM(FEED)	2	2	4	4	4	4	4	4	4	4	3
	5		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45	60
					IPT(fz)	.0003	.0004	.0011	.0013	.0018	.0020	.0027	.0033	.0036	.0042	.0045 / .0034
					RPM	800	560	450	400	280	250	220	180	140	120	110
					IPM(FEED)	1	1	2	2	2	2	3	3	3	3	3
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	85	90	90	105	90	90	105	105	90	90	100
					IPT(fz)	.0004	.0005	.0011	.0013	.0018	.0020	.0022	.0025	.0030	.0033	.0035 / .0026
					RPM	1300	1100	900	800	560	500	450	400	280	250	190
					IPM(FEED)	2	2	4	4	4	4	5	5	5	5	4
	7		0.5D	1.5D	IPM(FEED)	80	75	80	80	75	70	80	80	70	70	80
					IPT(fz)	.0004	.0006	.0013	.0016	.0022	.0025	.0023	.0026	.0030	.0033	.0033 / .0025
					RPM	1200	900	800	630	450	400	350	310	220	200	150
					IPM(FEED)	2	2	4	4	4	4	4	4	4	4	3
	8-9		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45	60
					IPT(fz)	.0003	.0004	.0011	.0013	.0018	.0020	.0027	.0033	.0036	.0042	.0045 / .0034
					RPM	800	560	450	400	280	250	220	180	140	120	110
					IPM(FEED)	1	1	2	2	2	2	3	3	3	3	3
	10	High alloyed steel, and tool steel	0.5D	1.5D	IPM(FEED)	85	90	90	105	90	90	105	105	90	90	100
					IPT(fz)	.0004	.0005	.0011	.0013	.0018	.0020	.0022	.0025	.0030	.0033	.0035 / .0026
					RPM	1300	1100	900	800	560	500	450	400	280	250	190
					IPM(FEED)	2	2	4	4	4	4	5	5	5	5	4
	11.1		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45	60
					IPT(fz)	.0003	.0004	.0011	.0013	.0018	.0020	.0027	.0033	.0036	.0042	.0045 / .0034
					RPM	800	560	450	400	280	250	220	180	140	120	110
					IPM(FEED)	1	1	2	2	2	2	3	3	3	3	3
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	IPM(FEED)	295	255	245	260	260	250	250	260	260	250	260
					IPT(fz)	.0003	.0006	.0011	.0016	.0022	.0027	.0027	.0028	.0033	.0036	.0037 / .0028
					RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700	500
					IPM(FEED)	6	7	11	13	14	15	15	14	16	15	11
	23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	295	255	245	260	260	250	250	260	260	250	260
					IPT(fz)	.0003	.0006	.0011	.0016	.0022	.0027	.0027	.0028	.0033	.0036	.0037 / .0028
					RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700	500
					IPM(FEED)	6	7	11	13	14	15	15	14	16	15	11



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

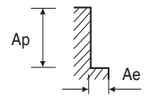
RECOMMENDED CUTTING CONDITIONS

E2191, E2226, E2192 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

3 FLUTE ROUGHING FOR ALUMINIUM - SIDE CUTTING

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 1/4	5/16	3/8	1/2	5/8	3/4	7/8	1	1-1/4	1-1/2
P	1	Non-alloy steel	0.5D	1.5D	SFM(Vc)	120	115	110	120	115	115	115	120	115	110
					IPT(fz)	.0006	.0010	.0018	.0026	.0033	.0037	.0060	.0067	.0076	.0086
					RPM	1800	1400	1100	900	700	630	500	450	350	310
					IPM(FEED)	3	4	6	7	7	7	9	9	8	8
	2		0.5D	1.5D	SFM(Vc)	105	90	90	105	90	90	105	105	90	90
					IPT(fz)	.0004	.0009	.0019	.0025	.0036	.0040	.0052	.0058	.0071	.0080
					RPM	1600	1100	900	800	560	500	450	400	280	250
					IPM(FEED)	2	3	5	6	6	6	7	7	6	6
	3-4		0.5D	1.5D	SFM(Vc)	80	75	80	80	75	70	80	80	70	70
					IPT(fz)	.0006	.0011	.0017	.0021	.0030	.0033	.0057	.0065	.0076	.0083
					RPM	1200	900	800	630	450	400	350	310	220	200
					IPM(FEED)	2	3	4	4	4	4	6	6	5	5
	5		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45
					IPT(fz)	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083
					RPM	800	560	450	400	280	250	220	180	140	120
					IPM(FEED)	1	1	2	2	2	2	3	3	3	3
	6	Low alloy steel	0.5D	1.5D	SFM(Vc)	105	90	90	105	90	90	105	105	90	90
					IPT(fz)	.0004	.0009	.0019	.0025	.0036	.0040	.0052	.0058	.0071	.0080
					RPM	1600	1100	900	800	560	500	450	400	280	250
					IPM(FEED)	2	3	5	6	6	6	7	7	6	6
	7		0.5D	1.5D	IPM(FEED)	80	75	80	80	75	70	80	80	70	70
					IPT(fz)	.0006	.0011	.0017	.0021	.0030	.0033	.0057	.0065	.0076	.0083
					RPM	1200	900	800	630	450	400	350	310	220	200
					IPM(FEED)	2	3	4	4	4	4	6	6	5	5
	8-9		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45
					IPT(fz)	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083
					RPM	800	560	450	400	280	250	220	180	140	120
					IPM(FEED)	1	1	2	2	2	2	3	3	3	3
	10	High alloyed steel, and tool steel	0.5D	1.5D	IPM(FEED)	105	90	90	105	90	90	105	105	90	90
					IPT(fz)	.0004	.0009	.0019	.0025	.0036	.0040	.0052	.0058	.0071	.0080
					RPM	1600	1100	900	800	560	500	450	400	280	250
					IPM(FEED)	2	3	5	6	6	6	7	7	6	6
	11.1		0.5D	1.5D	SFM(Vc)	50	45	45	50	45	45	50	45	45	45
					IPT(fz)	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083
					RPM	800	560	450	400	280	250	220	180	140	120
					IPM(FEED)	1	1	2	2	2	2	3	3	3	3
N	21-22	Aluminum-wrought alloy	0.5D	1.5D	IPM(FEED)	295	255	245	260	260	250	250	260	260	250
					IPT(fz)	.0004	.0008	.0015	.0022	.0029	.0036	.0045	.0047	.0067	.0071
					RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700
					IPM(FEED)	6	7	11	13	14	15	15	14	16	15
	23-25	Aluminum-cast, alloyed	0.5D	1.5D	SFM(Vc)	295	255	245	260	260	250	250	260	260	250
					IPT(fz)	.0004	.0008	.0015	.0022	.0029	.0036	.0045	.0047	.0067	.0071
					RPM	4500	3100	2500	2000	1600	1400	1100	1000	800	700
					IPM(FEED)	6	7	11	13	14	15	15	14	16	15



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

RECOMMENDED CUTTING CONDITIONS

E2237, E1237 SERIES

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

4 FLUTE CORNER ROUNDING

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø) 7/16	1/2	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2	1-5/8	1-15/16	1-7/8
P	1	Non-alloy steel	SFM(Vc)	65	65	65	65	65	65	65	65	65	65	65	65	65
			IPT(fz)	.0008	.0008	.0011	.0012	.0014	.0016	.0017	.0019	.0019	.0021	.0022	.0023	.0023
			RPM	580	500	400	340	290	250	220	200	180	170	160	130	130
			IPM(FEED)	1.8	1.6	1.8	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.2	1.2
	2		SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50
			IPT(fz)	.0008	.0008	.0011	.0012	.0014	.0016	.0016	.0018	.0018	.0021	.0021	.0023	.0023
			RPM	430	370	300	250	210	190	170	150	140	120	120	100	100
			IPM(FEED)	1.4	1.2	1.3	1.2	1.2	1.2	1.1	1.1	1	1	1	0.9	0.9
	3-4		SFM(Vc)	35	35	35	35	35	35	35	35	35	35	35	35	35
			IPT(fz)	.0009	.0010	.0013	.0015	.0018	.0019	.0023	.0025	.0028	.0031	.0000	.0000	.0036
			RPM	290	250	200	170	140	130	110	100	90	80	80	70	70
			IPM(FEED)	1	1	1	1	1	1	1	1	1	1	0	0	1
	5		SFM(Vc)	50	45	45	50	45	45	50	45	45	45	45	45	45
			IPT(fz)	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083	.0083	.0083	.0083
			RPM	800	560	450	400	280	250	220	180	140	120	120	120	120
			IPM(FEED)	1	1	2	2	2	2	3	3	3	3	3	3	3
	6	Low alloy steel	SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50
			IPT(fz)	.0008	.0008	.0011	.0012	.0014	.0016	.0016	.0018	.0018	.0021	.0021	.0023	.0023
			RPM	430	370	300	250	210	190	170	150	140	120	120	100	100
			IPM(FEED)	1.4	1.2	1.3	1.2	1.2	1.2	1.1	1.1	1	1	1	0.9	0.9
	7		IPM(FEED)	35	35	35	35	35	35	35	35	35	35	35	35	35
			IPT(fz)	.0009	.0010	.0013	.0015	.0018	.0019	.0023	.0025	.0028	.0031	.0000	.0000	.0036
			RPM	290	250	200	170	140	130	110	100	90	80	80	70	70
			IPM(FEED)	1	1	1	1	1	1	1	1	1	1	0	0	1
	8-9		SFM(Vc)	50	45	45	50	45	45	50	45	45	45	45	45	45
			IPT(fz)	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083	.0083	.0083	.0083
			RPM	800	560	450	400	280	250	220	180	140	120	120	120	120
			IPM(FEED)	1	1	2	2	2	2	3	3	3	3	3	3	3
	10	High alloyed steel, and tool steel	IPM(FEED)	50	50	50	50	50	50	50	50	50	50	50	50	50
			IPT(fz)	.0008	.0008	.0011	.0012	.0014	.0016	.0016	.0018	.0018	.0021	.0021	.0023	.0023
			RPM	430	370	300	250	210	190	170	150	140	120	120	100	100
			IPM(FEED)	1.4	1.2	1.3	1.2	1.2	1.2	1.1	1.1	1	1	1	0.9	0.9
	11.1		SFM(Vc)	50	45	45	50	45	45	50	45	45	45	45	45	45
			IPT(fz)	.0004	.0006	.0015	.0017	.0024	.0027	.0045	.0056	.0071	.0083	.0083	.0083	.0083
			RPM	800	560	450	400	280	250	220	180	140	120	120	120	120
			IPM(FEED)	1	1	2	2	2	2	3	3	3	3	3	3	3
N	21-22	Aluminum-wrought alloy	IPM(FEED)	295	295	295	295	295	295	295	295	295	295	295	295	295
			IPT(fz)	.0009	.0009	.0013	.0013	.0016	.0015	.0018	.0019	.0021	.0023	.0022	.0022	.0025
			RPM	2580	2250	1800	1500	1290	1130	1000	900	820	750	690	580	600
			IPM(FEED)	9	8	9	8	8	7	7	7	7	7	6	5	6
	23-25	Aluminum-cast, alloyed	SFM(Vc)	295	295	295	295	295	295	295	295	295	295	295	295	295
			IPT(fz)	.0009	.0009	.0013	.0013	.0016	.0015	.0018	.0019	.0021	.0023	.0022	.0022	.0025
			RPM	2580	2250	1800	1500	1290	1130	1000	900	820	750	690	580	600
			IPM(FEED)	9	8	9	8	8	7	7	7	7	7	6	5	6

※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

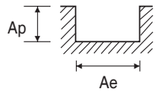
RECOMMENDED CUTTING CONDITIONS

E2482, E1482 SERIES

2 FLUTE - SLOTTING

SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2	3	4	5	6	8	10	12	14	16	18	20	22	25	28	30	32	36	40
P	1	Non-alloy steel	1.0D	0.5D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0002	.0003	.0005	.0009	.0011	.0014	.0018	.0022	.0025	.0029	.0032	.0036	.0039	.0044	.0038	.0041	.0043	.0032	.0036
					RPM	5570	3710	2790	2230	1860	1390	1110	930	800	700	620	560	510	450	400	370	350	310	280
					IPM(FEED)	2	2	3	4	4	4	4	4	4	4	4	4	4	4	3	3	3	2	2
	2		1.0D	0.5D	SFM(Vc)	100	100	100	100	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100
					IPT(fz)	.0001	.0003	.0004	.0008	.0009	.0017	.0021	.0025	.0022	.0033	.0038	.0042	.0035	.0039	.0044	.0031	.0033	.0037	.0042
					RPM	4780	3180	2390	1910	1590	1190	960	800	680	600	530	480	430	380	340	320	300	270	240
					IPM(FEED)	1	2	2	3	3	4	4	4	3	4	4	4	3	3	3	2	2	2	2
	3-4		1.0D	0.5D	SFM(Vc)	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	85	65	80	80
					IPT(fz)	.0001	.0004	.0005	.0006	.0011	.0015	.0019	.0023	.0026	.0030	.0034	.0038	.0042	.0031	.0036	.0037	.0050	.0045	.0050
					RPM	3980	2650	1990	1590	1330	1000	800	660	570	500	440	400	360	320	280	270	200	220	200
					IPM(FEED)	1	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2
	5		1.0D	0.5D	SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
					IPT(fz)	.0002	.0003	.0004	.0005	.0013	.0017	.0021	.0025	.0029	.0033	.0037	.0042	.0045	.0026	.0029	.0031	.0033	.0038	.0042
					RPM	2390	1590	1190	960	800	600	480	400	340	300	270	240	220	190	170	160	150	130	120
					IPM(FEED)	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1
	6	Low alloy steel	1.0D	0.5D	SFM(Vc)	100	100	100	100	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100
					IPT(fz)	.0001	.0003	.0004	.0008	.0009	.0017	.0021	.0025	.0022	.0033	.0038	.0042	.0035	.0039	.0044	.0031	.0033	.0037	.0042
					RPM	4780	3180	2390	1910	1590	1190	960	800	680	600	530	480	430	380	340	320	300	270	240
					IPM(FEED)	1	2	2	3	3	4	4	4	3	4	4	4	3	3	3	2	2	2	2
	7		1.0D	0.5D	IPM(FEED)	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	85	65	80	80
					IPT(fz)	.0001	.0004	.0005	.0006	.0011	.0015	.0019	.0023	.0026	.0030	.0034	.0038	.0042	.0031	.0036	.0037	.0050	.0045	.0050
					RPM	3980	2650	1990	1590	1330	1000	800	660	570	500	440	400	360	320	280	270	200	220	200
					IPM(FEED)	1	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2
	8-9		1.0D	0.5D	SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
					IPT(fz)	.0002	.0003	.0004	.0005	.0013	.0017	.0021	.0025	.0029	.0033	.0037	.0042	.0045	.0026	.0029	.0031	.0033	.0038	.0042
					RPM	2390	1590	1190	960	800	600	480	400	340	300	270	240	220	190	170	160	150	130	120
					IPM(FEED)	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1
	10	High alloyed steel, and tool steel	1.0D	0.5D	IPM(FEED)	100	100	100	100	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100
					IPT(fz)	.0001	.0003	.0004	.0008	.0009	.0017	.0021	.0025	.0022	.0033	.0038	.0042	.0035	.0039	.0044	.0031	.0033	.0037	.0042
					RPM	4780	3180	2390	1910	1590	1190	960	800	680	600	530	480	430	380	340	320	300	270	240
					IPM(FEED)	1	2	2	3	3	4	4	4	3	4	4	4	3	3	3	2	2	2	2
	11.1		1.0D	0.5D	SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
					IPT(fz)	.0002	.0003	.0004	.0005	.0013	.0017	.0021	.0025	.0029	.0033	.0037	.0042	.0045	.0026	.0029	.0031	.0033	.0038	.0042
					RPM	2390	1590	1190	960	800	600	480	400	340	300	270	240	220	190	170	160	150	130	120
					IPM(FEED)	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1
N	21-22	Aluminum-wrought alloy	1.0D	0.5D	IPM(FEED)	245	345	330	330	345	330	310	310	310	330	330	330	315	310	310	345	330	325	330
					IPT(fz)	.0003	.0004	.0007	.0010	.0011	.0019	.0025	.0030	.0032	.0035	.0040	.0041	.0043	.0045	.0046	.0050	.0045	.0051	.0050
					RPM	11940	11140	7960	6370	5570	3980	3020	2520	2160	1990	1770	1590	1380	1210	1080	1110	1000	880	800
					IPM(FEED)	7	10	11	13	12	15	15	15	14	14	14	13	12	11	10	11	9	9	8
	23-25	Aluminum-cast, alloyed	1.0D	0.5D	SFM(Vc)	160	225	215	215	225	215	205	205	205	215	215	215	205	205	205	225	215	215	215
					IPT(fz)	.0003	.0004	.0007	.0010	.0011	.0019	.0025	.0030	.0032	.0035	.0039	.0038	.0044	.0044	.0049	.0049	.0046	.0052	.0048
					RPM	7800	7220	5170	4140	3610	2590	1970	1650	1410	1290	1150	1040	900	790	710	720	650	580	520
					IPM(FEED)	4	6	7	8	8	10	10	10	9	9	9	8	8	7	7	7	6	6	5



※ The Feed, in long & extra long types, should be reduced by around 50%.

COBALT & HSS END MILLS

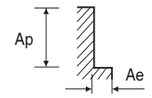
RECOMMENDED CUTTING CONDITIONS

E2483, E1483 SERIES

4 FLUTE - SIDE CUTTING

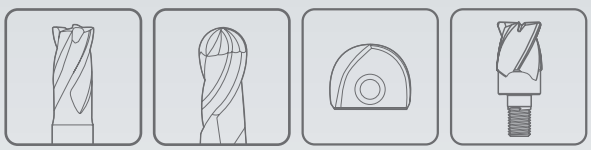
SFM(Vc) = ft./min.
IPT(fz) = in./tooth
RPM = rev./min.
IPM(Feed) = in./min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 2	3	4	5	6	8	10	12	14	16	18	20	22	25	28	30	32	36	40
P	1	Non-alloy steel	0.1D	1.5D	SFM(Vc)	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115
					IPT(fz)	.0002	.0003	.0005	.0008	.0009	.0014	.0018	.0024	.0028	.0032	.0032	.0036	.0039	.0039	.0038	.0041	.0043	.0040	.0045
					RPM	5570	3710	2790	2230	1860	1390	1110	930	800	700	620	560	510	450	400	370	350	310	280
					IPM(FEED)	4	5	6	7	7	8	8	9	9	9	8	8	8	7	6	6	6	5	5
	2		0.1D	1.5D	SFM(Vc)	100	100	100	100	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100
					IPT(fz)	.0001	.0002	.0004	.0007	.0009	.0015	.0018	.0022	.0066	.0029	.0033	.0036	.0035	.0033	.0037	.0031	.0033	.0037	.0042
					RPM	4780	3180	2390	1910	1590	1190	960	800	680	600	530	480	430	380	340	320	300	270	240
					IPM(FEED)	2	3	4	5	6	7	7	7	18	7	7	7	6	5	5	4	4	4	4
	3-4		0.1D	1.5D	SFM(Vc)	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	85	65	80	80
					IPT(fz)	.0001	.0003	.0004	.0006	.0008	.0013	.0016	.0019	.0022	.0025	.0028	.0025	.0028	.0031	.0027	.0028	.0025	.0034	.0038
					RPM	3980	2650	1990	1590	1330	1000	800	660	570	500	440	400	360	320	280	270	200	220	200
					IPM(FEED)	2	3	3	4	4	5	5	5	5	5	5	4	4	4	3	3	2	3	3
	5		0.1D	1.5D	SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
					IPT(fz)	.0001	.0002	.0004	.0005	.0006	.0013	.0016	.0019	.0022	.0025	.0028	.0031	.0034	.0026	.0029	.0031	.0033	.0038	.0021
					RPM	2390	1590	1190	960	800	600	480	400	340	300	270	240	220	190	170	160	150	130	120
					IPM(FEED)	1	1	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	1
	6	Low alloy steel	0.1D	1.5D	SFM(Vc)	100	100	100	100	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100
					IPT(fz)	.0001	.0002	.0004	.0007	.0009	.0015	.0018	.0022	.0066	.0029	.0033	.0036	.0035	.0033	.0037	.0031	.0033	.0037	.0042
					RPM	4780	3180	2390	1910	1590	1190	960	800	680	600	530	480	430	380	340	320	300	270	240
					IPM(FEED)	2	3	4	5	6	7	7	7	18	7	7	7	6	5	5	4	4	4	4
	7		0.1D	1.5D	IPM(FEED)	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	85	65	80	80
					IPT(fz)	.0001	.0003	.0004	.0006	.0008	.0013	.0016	.0019	.0022	.0025	.0028	.0025	.0028	.0031	.0027	.0028	.0025	.0034	.0038
					RPM	3980	2650	1990	1590	1330	1000	800	660	570	500	440	400	360	320	280	270	200	220	200
					IPM(FEED)	2	3	3	4	4	5	5	5	5	5	5	4	4	4	3	3	2	3	3
	8-9		0.1D	1.5D	SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
					IPT(fz)	.0001	.0002	.0004	.0005	.0006	.0013	.0016	.0019	.0022	.0025	.0028	.0031	.0034	.0026	.0029	.0031	.0033	.0038	.0021
					RPM	2390	1590	1190	960	800	600	480	400	340	300	270	240	220	190	170	160	150	130	120
					IPM(FEED)	1	1	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	1
	10	High alloyed steel, and tool steel	0.1D	1.5D	IPM(FEED)	100	100	100	100	100	100	100	100	100	100	100	100	95	100	100	100	100	100	100
					IPT(fz)	.0001	.0002	.0004	.0007	.0009	.0015	.0018	.0022	.0066	.0029	.0033	.0036	.0035	.0033	.0037	.0031	.0033	.0037	.0042
					RPM	4780	3180	2390	1910	1590	1190	960	800	680	600	530	480	430	380	340	320	300	270	240
					IPM(FEED)	2	3	4	5	6	7	7	7	18	7	7	7	6	5	5	4	4	4	4
	11.1		0.1D	1.5D	SFM(Vc)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
					IPT(fz)	.0001	.0002	.0004	.0005	.0006	.0013	.0016	.0019	.0022	.0025	.0028	.0031	.0034	.0026	.0029	.0031	.0033	.0038	.0021
					RPM	2390	1590	1190	960	800	600	480	400	340	300	270	240	220	190	170	160	150	130	120
					IPM(FEED)	1	1	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2	1
N	21-22	Aluminum-wrought alloy	0.1D	1.5D	IPM(FEED)	245	345	330	330	345	330	310	310	310	330	330	330	315	310	310	345	330	325	330
					IPT(fz)	.0002	.0004	.0006	.0007	.0008	.0014	.0019	.0023	.0023	.0026	.0030	.0030	.0031	.0035	.0037	.0036	.0035	.0037	.0034
					RPM	11940	11140	7960	6370	5570	3980	3020	2520	2160	1990	1770	1590	1380	1210	1080	1110	1000	880	800
					IPM(FEED)	9	16	18	19	18	23	23	23	20	21	21	19	17	17	16	16	14	13	11
	23-25	Aluminum-cast, alloyed	0.1D	1.5D	SFM(Vc)	160	225	215	215	225	215	205	205	205	215	215	215	205	205	205	225	215	215	215
					IPT(fz)	.0002	.0003	.0005	.0007	.0008	.0014	.0019	.0023	.0023	.0025	.0028	.0029	.0031	.0035	.0035	.0035	.0035	.0034	.0034
					RPM	7800	7220	5170	4140	3610	2590	1970	1650	1410	1290	1150	1040	900	790	710	720	650	580	520
					IPM(FEED)	6	10	11	12	12	15	15	15	13	13	13	12	11	11	10	10	9	8	7



※ The Feed, in long & extra long types, should be reduced by around 50%.

Global Cutting Tool Leader **YG-1**



MILLING

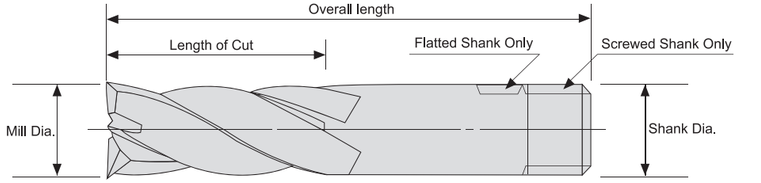
YG

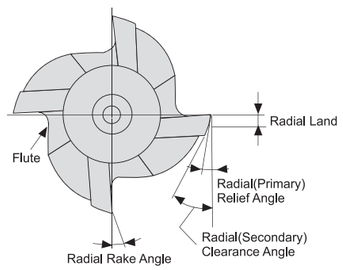
Leading Through Innovation

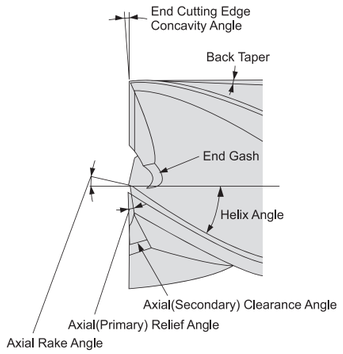
MILLING TOOLS

TECHNICAL DATA

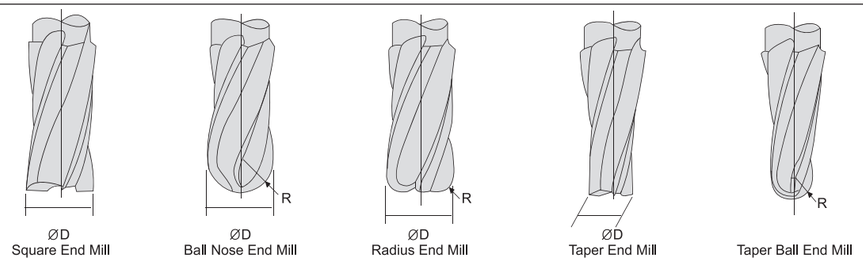
1 Names of End Mill Parts



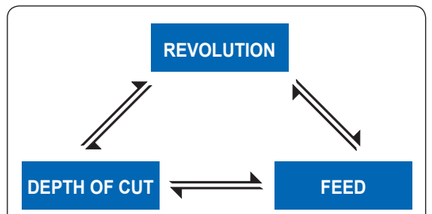




2 Type of End Mill



Speed, feed and depth of cut are the most important factors to consider for best results in milling. Improper feeds and speeds often cause low production, poor work quality and unnecessary damage to the cutter.
This section covers the basic principles of speed and feed selection for milling cutters and end mills. It will serve as a guide in setting-up new milling jobs.



INTERRELATIONSHIP OF THREE FACTORS

TECHNICAL DATA SUPER CUTTING END MILLS

3 Speeds

In milling, Speed is measured in peripheral feet per minute.(revolution per minute × cutter circumference in feet) This is frequently referred to as “peripheral speed” “cutting speed” or “surface speed”.

Revolutions per Minute $N = \frac{1000V}{\pi \times D}$

V : Cutting Speed(m/min)
D : Diameter of Tool(mm)
N : Revolution per minute(rev/min)
π : 3.1416

They will have to be tempered to suit the conditons ON THE JOB. For example:

Use Lower Speed Ranges for	Use Higher Speed Ranges for
Hard materials	Softer materials
Tough materials	Better finishes
Abrasive materials	Smaller diameter cutters
Heavy cuts	Light cuts
Minimum tool wear	Frail work pieces or set-ups
Maximum cutter life	Hand feed operations
	Maximum production rates
	Non-metallics

4 Feeds

Feed is usually measured in millimeters per minute. It is the product of feed per tooth times revolution per minute times the number of teeth in the cutter. Due to variations in cutter sizes, numbers of teeth and revolutions per minute, all feed rates should be calculated from feed per tooth. Feed per tooth is the basis of all feed rates per minute, whether the cutters are large or small, fine or coarse tooth, and are run at high or low peripheral speed. Because feed per tooth affects chip thickness. It is a very important factor in cutter life.
Highest possible feed per tooth will usually give longer cutter life between grinds and greater production per grind. Excessive feeds may over load the cutter teeth and cause breakage or chipping of the cutting edges. The following factors should be kept in mind when using the recommended starting feed per tooth.

Feed in milimeters per Minute

F.M = F.R.×RPM

F.R. : Feed per Revolutions in milimeters
RPM : Revolutions per Minutes

The following factors should be kept in mind when using the recommended stating feed per tooth.

Use Higher Feeds For	Use Lower Feeds For
Heavy, roughing cuts	Light, and finishing cuts
Rigid set-ups	Frail set-ups
Easy-to-machine work materials	Hard to machine work materials
Rugged cutters	Frail and small cutters
Slab milling cuts	Deep slots
Low tensile strength materials	High tensile strength materials
Coarse tooth cutters	Fine tooth cutters
Abrasive materials	

SPEED AND FEED CALCULATIONS FOR MILLING CUTTERS AND OTHER ROTATING TOOLS

TO FIND	HAVING		FORMULA
Surface(or Periphery) Speed in meter Per Minute=SPM	Diameter of Tool in milimeters Revolutions per Minute	=D =RPM	$V=\frac{D\times3.1416\times RPM}{1000}$
Revolutions Per Minute=RPM	Surface Speed in meter per Minute Diameter of Tool in milimeters	=SPM =D	$RPM=\frac{V\times1000}{D\times3.1416}$
Feed per Revolution in milimeters-F.R.	Feed in milimeters per Minute Revolution per Minute	=F.M. =RPM	$F.R.=\frac{F.M.}{RPM}$
Feed in milimeters Per Minute-F.M.	Feed per Revolution in milimeters Revolution per Minute	=F.R. =RPM	F.M.= F.R.×RPM
Number of Cutting Teeth per Minute=T.M.	Number of Teeth in Tool Revolution per Minute	=T =RPM	T.M=T×RPM
Feed per tooth=F.T.	Number of Teeth in Tool Feed per Revolution in milimeters	=T =RPM	$F.T.=\frac{F.R.}{T}$
Feed per Tooth=F.T.	Number of Teeth in Tool Feed in milimeters per Minute Speed in Revolution per Minute	=T =F.M. =RPM	$F.T.=\frac{F.M.}{T\times RPM}$

5 Case of Resharpening

When the product finish become worse, the cutting edge must get dulled, chips become smaller and the cutting sound gets louder. In such cases, an end mill must be resharpened. The following are the damages of end mills when the resharpening is required.

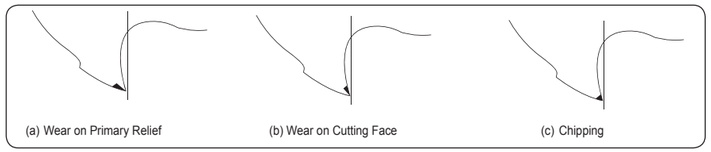


Fig. 1. Damages of Cutting Edge

6 Sharpen at Predetermined Wear Land

Cutters should be sharpened as soon as the wear land(Fig. 2.) reaches a predetermined width. This width should permit sharpening without excessive loss of tool life. It may vary from a few hundreths to some tenth of a millimeter, depending on the type of cutter and the finish required on the product. This method is used on production runs where uneven amounts of stock is removed or where the material varies in machinability. It is also used on small quantity product lots.

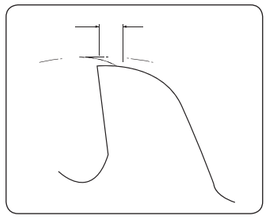


Fig. 2. Wear Land

Resharpening Peripheral Cutting Edge

1 RESHARPENING PERIPHERAL CUTTING EDGE

The geometry of relief angle in an end mill consists of three methods as shown in Fig.3 concave, flat, and eccentric. Recently, most end mills have the eccentric relief(eccentric sharpening). In this method, since the relief is formed an eccentric are surface in cylindrical grinding method, the roughness of the finished surface of the relief improves and the strength of cutting edge increase at the same time.(Fig.4) As a result, the tool life is improved.

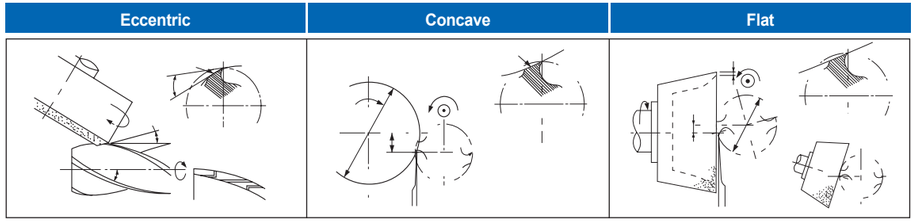


Fig. 3. Three Types of Primary Relief

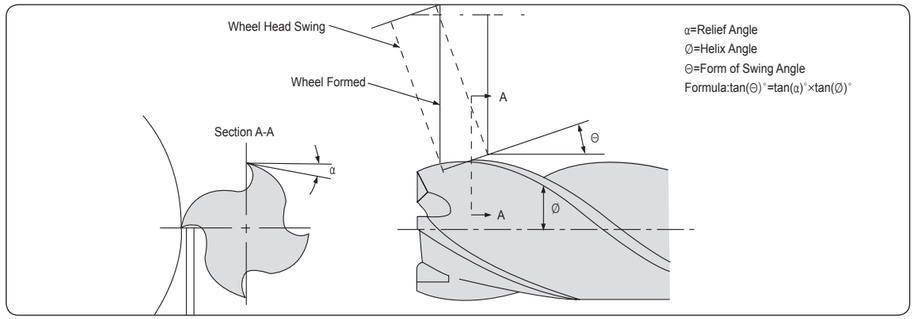


Fig. 4. Toothing of Eccentric Relief Angle

2 ANGLE OF WHEEL INCLINATION

Eccentric relief is produced with a plain wheel positioned with its axis parallel or at a slight angle with the cutter axis. The degree of relief is varied by changing the angle of wheel inclination.

Table 1. RECOMMENDED RELIEF ON END MILLS

Mill Diameter (inches)	Eccentric relief indicator drop for relief Angles shown		Checking Distance	Wheel Angles(Deg.)Θ			Radial Relief Angles(α1)	Clearance Angles(α2)
				15° Helix	30° Helix	60° Helix		
-	Min.	Max.	-	*Angle	*Angle	*Angle	*Angle	*Angle
1/8	.0040	.0052	.015	4°42′	10°02′	27°58′	17°03′	25°
1/4	.0035	.0050	.020	3°15′	6°59′	20°12′	12°00′	25°
1/2	.0040	.0053	.025	2°51′	6°07′	17°51′	10°32′	25°
1	.0038	.0055	1/32	2°16′	4°54′	14°27′	8°27′	25°
1-1/2	.0033	.0050	1/32	2°02′	4°22′	12°57′	7°33′	25°
2	.0033	.0050	1/32	2°02′	4°22′	12°57′	7°33′	25°

The actual at the radial relief angle is normally kept within the range shown but may be varied to suit the cutter material, the work material and the operating conditions.
* Angle is calculated from the basic mean at the radical angle.

8 Resharpening End Teeth

The three necessary operations and one option feature, along with setup suggestions are shown in Fig.5 A to D in each drawing, the shaded area indicates the surface being ground.

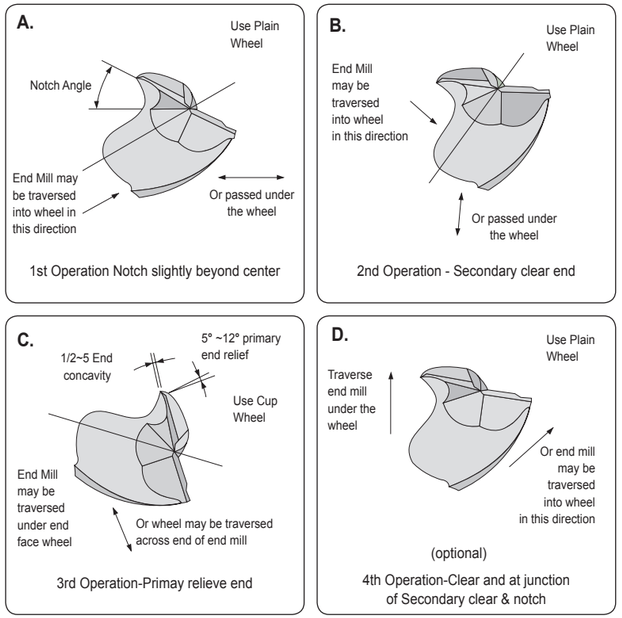


Fig 5. PROCEDURE FOR SHARPENING END OF 2 FLUTE SQUARE END MILLS

9 Inspection

The inspection is calculated by using the formula shown in Table1.
Procedure To Check
Radial Relief Angles
With Indicators.

1. Mount the cutter to rotate freely with no end movement.
2. Adjust the sharp pointed indicator to bear at the very tip of the cutting edge, pointing in a radial line, shown in Figure6
3. Roll the cutter the tabuleted amount gives under “checking distance” using the second indicator as control.
4. Consult chart for amount of drop for the particular diameter and relief angle.

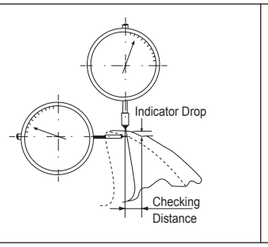
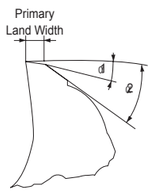
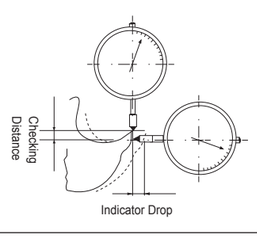
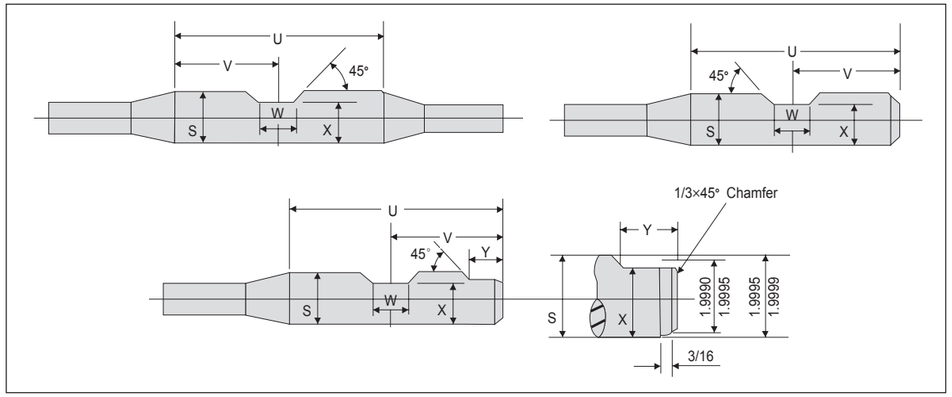
Radial Relief	Peripheral Cutting Edge	Cutting Angle
		

Fig. 6. Indicator Set-Up for Checking

10 Standard Weldon Shanks



11 Dimensions

All dimensions are given in inches.

Diameter of Shank S	Length of Shank U	V	W		X	Y
			Min.	Max.		
3/8	1-9/16	25/32	0.280	0.282	0.325	-
1/2	1-25/32	57/64	0.330	0.332	0.440	-
5/8	1-29/32	61/64	0.400	0.402	0.560	-
3/4	2-1/32	1-1/64	0.455	0.457	0.675	-
7/8	2-1/32	1-1/64	0.455	0.457	0.810	1/2
1	2-9/32	1-9/64	0.515	0.517	0.925	1/2
1-1/4	2-9/32	1-9/64	0.515	0.517	1.156	1/2
1-1/2	2-11/16	1-3/16	0.515	0.517	1.406	9/16
2	3-1/4	1-27/32	0.700	0.702	1.900	27/32
2-1/2	3-1/2	1-15/16	0.700	0.702	2.400	27/32

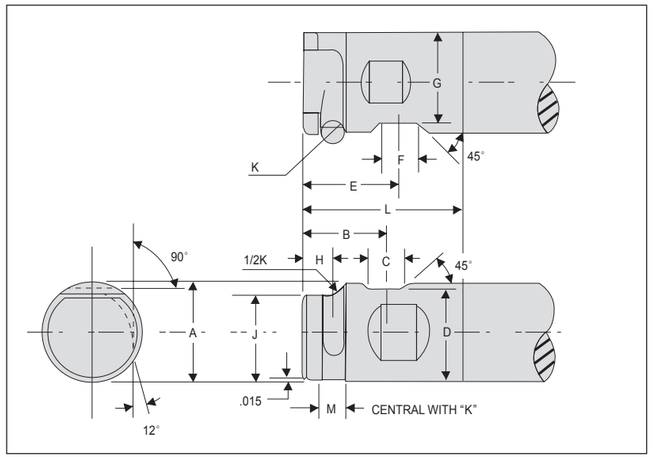
12 Tolerances

Element	Range	Direction	Tolerance
Diameter of Shank, S	All Sizes	minus	.0001 to .0005
Length of Shank, U	All Sizes	plus or minus	1/32
Dimension, V	All Sizes	plus or minus	1/64
Dimension, X	All Sizes	minus	1/64
Dimension, Y	7/8 to 2-1/2 inc.	plus or minus	1/32

Extracted from Milling Cutters and End Mills. MCTI 1989.

13 Combination Shanks for End Mills

Right hand End Mill shank shown. For left hand End Mills flat “F” and pin groove “K” should be located 180° from that shown, maintaining 12° relationship of flat “F” and groove “K”



14 Dimensions

All dimensions are given in inches.

Diameter of Shank A	Length of Shank L	B	C	D	E	F	G	H	J	K	M
1-1/2	2-11/16	1-3/16	0.515	1.406	1-1/2	0.515	1.371	9/16	1.302	0.377	7/16
2	3-1/4	1-23/32	0.700	1.900	1-3/4	0.700	1.809	5/8	1.772	0.440	1/2
2-1/2	3-1/2	1-15/16	0.700	2.400	2	0.700	2.312	3/4	2.245	0.503	9/16

15 Tolerances

Element	Direction	Tolerance
Diameter of Shank, A	minus	.0001 to .0005
Length of Shank, L	plus or minus	1/32
Dimension, B	plus or minus	1/64
Dimension, C	plus	.002
Dimension, D	minus	1/64
Dimension, E	plus or minus	1/64
Dimension, F	plus or minus	.005
Dimension, G	minus	1/64
Dimension, H	plus	1/64
Dimension, J	plus or minus	.002
Dimension, K	plus	.003

Extracted from Milling Cutters and End Mills. MCTI 1989.

16 Troubleshooting in Endmilling

Trouble	Occurrences of trouble	Countermeasures
Breaking of tool	• At time of engaging with work material • When ending cut	1. Decrease feed rate. 2. Decrease projection amount 3. Shorten cutting edge length to required minimum limit
	• During normal cutting	1. Decrease feed rate 2. Control wear → replace tool early 3. Replace chuck or collet 4. Decrease projection amount 5. Carry out honing 6. If 4 flute, reduce to 2 flute(clogging of chipping) 7. If dry cutting change to wet cutting utilize cutting fluid. In case of wet cutting flow oil supplied from the front, change to from rear angle of side top. Use ample with rate.
	• When changing direction of feed	1. Utilize circular interpolation(in case of NC machine) or temporarily stop feed(Dowelling) 2. Reduce feed rate before and after change of directions 3. Replace chuck or collect
Fracture of cutting edge	• Fracture of corners	1. Carry out chamfering or nose with hand lapper. 2. Down cut → Up cut
	• Fracture at boundary of depth of cut	1. Down cut → Up cut 2. Reduce cutting speed
	• Chipping at center part or overall	1. Carry out honing. Or enlarge. 2. Change number of rotation(in case machine vibrates) 3. Increase cutting speed 4. In ease of squeaking noise during cutting, increase feed. 5. It dry cutting use cutting fluid or blow air. 6. Replace chuck or collet 7. Reduce cutting speed
	• Large fracturing of cutting edge	1. Decrease feed rate 2. If 4 flute reduce to 2 flute 3. Carry out honing. Or enlarge 4. Replace chuck or collet 5. Reduce cutting speed 6. If dry cutting, change to wet cutting. In case oil supply in wet cutting is from the front, change to rear at an angle or from side top. Use ample supply.
Rapid tool wear		1. Reduce cutting speed 2. Up cut → Down cut 3. Increase feed 4. Utilize wet cutting or air 5. If reground tool, improve surface roughness of flank.

TECHNICAL DATA

SUPER CUTTING END MILLS

Trouble	Occurrences of trouble	Countermeasures
Inferior finished surface	• Surface is good but rough	1. Decrease feed 2. In case using 2 flute, increase to 4 flute
	• Small chip welding	1. Increase cutting speed 2. Utilize wet cutting air blow(ample supply) 3. Carry out fine honing 4. Up cut → Down cut 5. Increase feed or enlarge finish allowance
	• With transverse streaks	1. Carry out fine honing 2. Use water insoluble cutting fluid 3. Down cut → Up cut
	• Signs of excessive cutting	1. Reduce finishing depth of cut 2. Increase cutting speed 3. Reduce feed
Poor machining accuracy	• Finish dimensions are on minus side	1. Up cut → Down cut 2. Reduce finishing depth of cut 3. Replace chuck or collet 4. Reduce projection amount 5. Increase cutting speed
	• Poor perpendicularity	1. Reduce finishing depth of cut 2. Replace chuck or collet 3. Reduce projection amount 4. Increase cutting speed 5. 2Flute → 4 Flute 6. Reduce feed 7. Check wear rate → Replace tool
Chattering		1. Increase feed rate(in case over 0.05 mm/Zahn, try reducing) 2. Change cutting speed 3. Replace chuck or collet 4. Reduce projection amount 5. Use 2 flute cutter for rough cutting and 4 flute for finishing 6. Down cut → Up cut