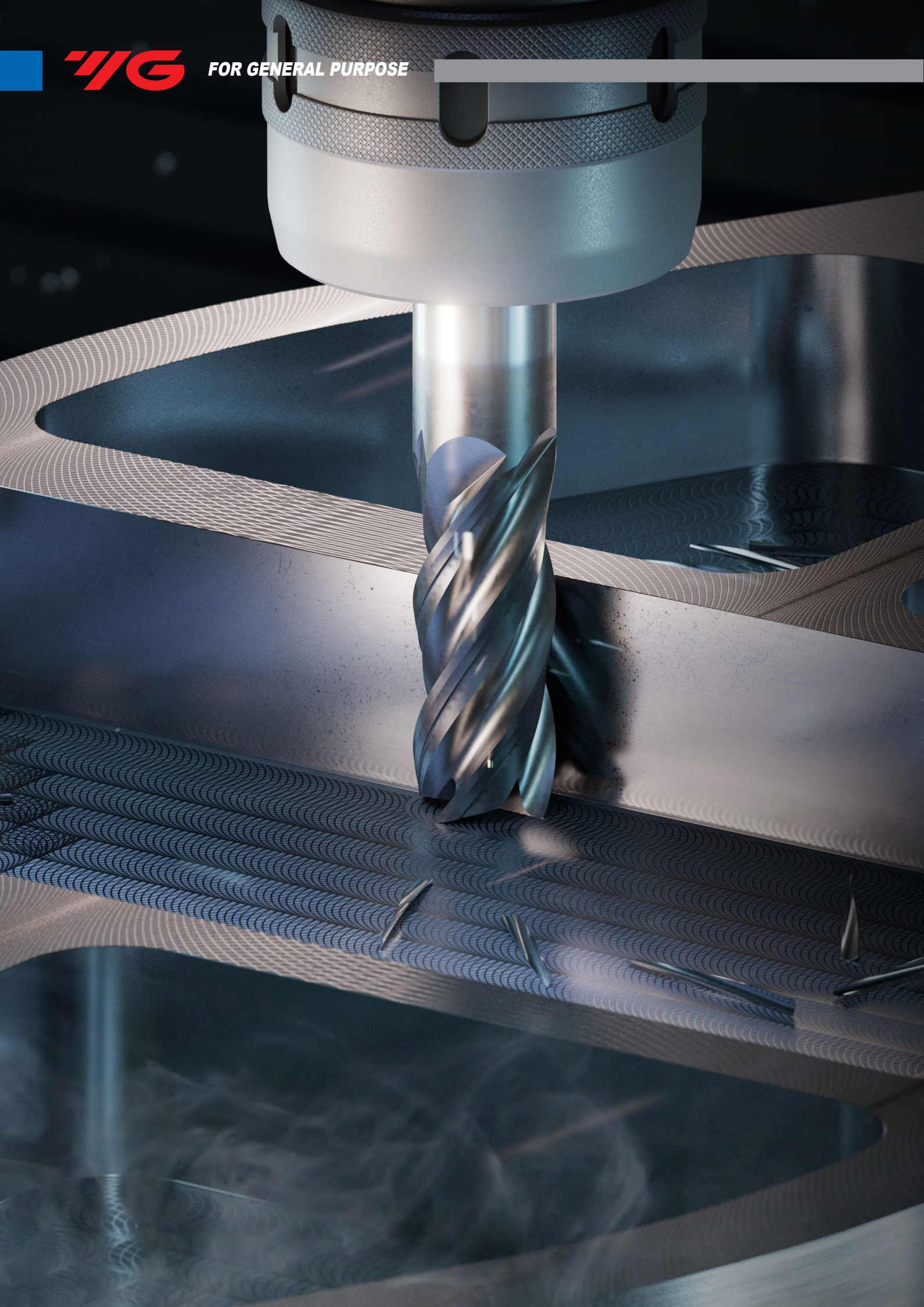
YA-EV25 ASIA

SOLID CARBIDE END MILL

EV MILLS

Optimized Versatility for Various Materials

- Ensures smooth chip evacuation and easy programming
- Highest metal removal rates and tool life



SOLID CARBIDE END MILL

MILLS

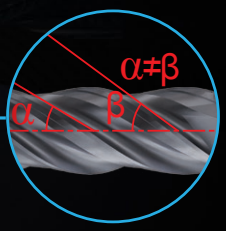
Optimized Versatility for Various Materials

PRODUCT FEATURES & LINE UP

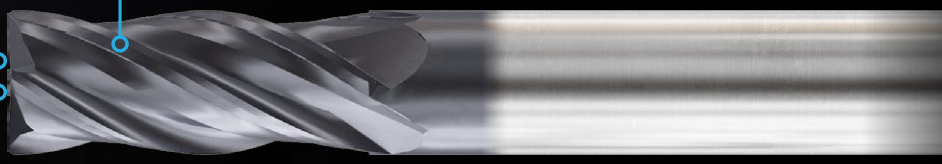
	2 Flute	Ball Nose	R0.05mm – R8.0mm	Ensures smooth chip evacuation and easy programming
		Conner Radius	Ø 1.0 mm - Ø 2.0mm	
		Square	Ø 0.1 mm - Ø 6.0mm	
	4 Flute	Conner Radius	Ø 1mm – Ø 20mm	Highest Metal Removal Rates and Tool life
		Conner Radius (High Feed)	Ø 4.0mm – Ø 12.0mm	
		Square	Ø 1mm – Ø 20mm	

PRODUCT GEOMETRY

Unequal Index
Unique geometry applied to reduce vibration and also to achieve excellent chip evacuation for better surface finish



Multiple Helix
For optimal chip formation and chip evacuation concluding faster and heavier cutting providing higher productivity

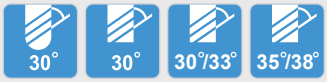


Enforced Cutting Edge
Increasing corner stability at square end mills to enable higher tool life

Ultra Fine Grain Carbide
Premium carbide substrate achieving exceptional wear resistance

GUIDE TO ICONS

Helix Angle



Cutting Condition Pages

Tool Material

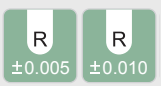
Type of Coating

Type of Shank

Plain Shank

No. of Flutes

Tolerance of Ball Radius



SELECTION GUIDE

SERIES	GMK31	GMK49	GMK50
FLUTE	2	2	2
HELIX ANGLE	30°	30°	30°
CUTTING EDGE SHAPE	BALL NOSE	BALL NOSE	CORNER RADIUS
SIZE MIN	R0.05	R0.1	D1.0
SIZE MAX	R8.0	R6.0	D2.0
PAGE	6	8	12
		LONG NECK	
	Y-Coating	Y-Coating	Y-Coating

SOLID CARBIDE END MILL
EV MILLS

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.8-10

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	◎	◎	◎
	11.1			Quenched & Tempered	325	35	◎	◎	◎
	11.2			Quenched & Tempered	409	44	◎	◎	◎
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				○
	29.1	Non Metallic Materials	Duroplastic						○
	29.2		GRAPHITE						
	29.3		CFRP, GFRP						
	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	38.1	Hardened steel		Hardened	421-469	45-49	○	○	○
	38.2			Hardened	481-560	50-55			
	39.1			Hardened	577-654	56-60			
	39.2			Hardened	670-739	61-65			
	39.3			Hardened		66-70			
	40	Chilled Cast Iron		Cast	400	42	○	○	○
	41	Hardened Cast Iron		Hardened	550	55			

GMK51	GMK52	GMK32	GMK33	
4	4	2	4	
30°/33° (MULTIPLE)	35°/38° (MULTIPLE)	30°	35°/38° (MULTIPLE)	
CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	
D1.0	D4.0	D0.1	D1.0	
D20.0	D12.0	D6.0	D20.0	
13	15	16	17	
	HIGH FEED			
Y-Coating	Y-Coating	Y-Coating	Y-Coating	
				
◎	◎	◎	◎	1
◎	◎	◎	◎	2
◎	◎	◎	◎	3
◎	◎	◎	◎	4
◎	◎	◎	◎	5
◎	◎	◎	◎	6
◎	◎	◎	◎	7
◎	◎	◎	◎	8
◎	◎	◎	◎	9
◎	◎	◎	◎	10
◎	◎	◎	◎	11.1
◎	◎	◎	◎	11.2
○	○		○	12
○	○		○	13
○	○	○	○	14
○	○	○	○	15
○	○	○	○	16
○	○	○	○	17
○	○	○	○	18
○	○	○	○	19
○	○	○	○	20
				21
				22
				23
				24
				25
	○	○	○	26
	○	○	○	27
	○	○	○	28
	○	○	○	29.1
				29.2
				29.3
				30
	○		○	31
	○		○	32
	○		○	33
	○		○	34
	○		○	35
	○		○	36
	○		○	37
○	○	○	○	38.1
				38.2
				39.1
				39.2
				39.3
○	○	○	○	40
				41

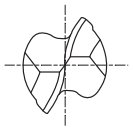
SOLID CARBIDE END MILLS

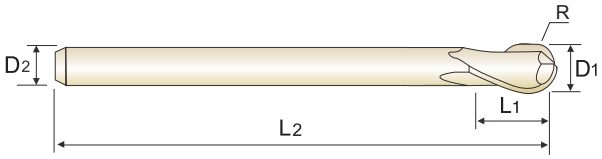
2 FLUTE BALL NOSE

SERIES

PLAIN SHANK **GMK31**

▶ Ensures smooth chip evacuation and enhanced cutting performance at the ball tip.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating | p.18

R0.05~R3 R3.5~R8

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK31001	R0.05	**0.1**	4	0.2	40
GMK310015	R0.075	**0.15**	4	0.3	40
GMK31002	R0.1	**0.2**	4	0.4	40
GMK31003	R0.15	**0.3**	4	0.6	40
GMK31004	R0.2	**0.4**	4	0.8	40
GMK31005	R0.25	**0.5**	4	1	40
GMK31006	R0.3	**0.6**	4	1.2	40
GMK31008	R0.4	**0.8**	4	1.6	40
GMK310104S	R0.5	**1.0**	4	2.5	50
GMK310124S	R0.6	**1.2**	4	3	50
GMK310154S	R0.75	**1.5**	4	4	50
GMK310204S	R1.0	**2.0**	4	5	50
GMK310200804S	R1.0	**2.0**	4	5	80
GMK310250504S	R1.25	**2.5**	4	6	50
GMK310300504S	R1.5	**3.0**	4	6	50
GMK310300804S	R1.5	**3.0**	4	6	80
GMK31040	R2.0	**4.0**	6	8	70
GMK31040100	R2.0	**4.0**	6	8	100

▶ NEXT PAGE

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	11.1	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
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	38.1	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
Recommend																		○					○	

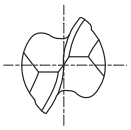
SOLID CARBIDE END MILLS

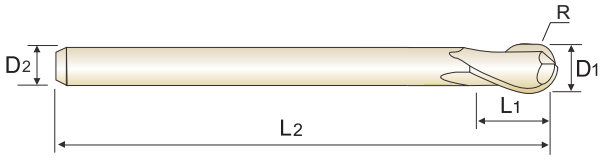
2 FLUTE BALL NOSE

SERIES

PLAIN SHANK **GMK31**

▶Ensures smooth chip evacuation and enhanced cutting performance at the ball tip.





CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p. 18

R0.05~R3 R3.5~R8

Unit : mm

EDP No.	Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK3104005045	R2.0	**4.0**	4	8	50
GMK31050	R2.5	**5.0**	6	10	80
GMK31060060	R3.0	**6.0**	6	9	60
GMK31060075	R3.0	**6.0**	6	12	75
GMK31060	R3.0	**6.0**	6	12	90
GMK31070	R3.5	**7.0**	8	14	90
GMK31080060	R4.0	**8.0**	8	12	60
GMK31080075	R4.0	**8.0**	8	14	75
GMK31080	R4.0	**8.0**	8	14	100
GMK31090	R4.5	**9.0**	10	18	100
GMK31100080	R5.0	**10.0**	10	15	80
GMK31100	R5.0	**10.0**	10	18	100
GMK31100150	R5.0	**10.0**	10	18	150
GMK31120080	R6.0	**12.0**	12	18	80
GMK31120	R6.0	**12.0**	12	22	110
GMK31120150	R6.0	**12.0**	12	22	150
GMK31160	R8.0	**16.0**	16	30	150
GMK3116032100	R8.0	**16.0**	16	32	100

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	11.1	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
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	38.1	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
Recommend																		○					○	

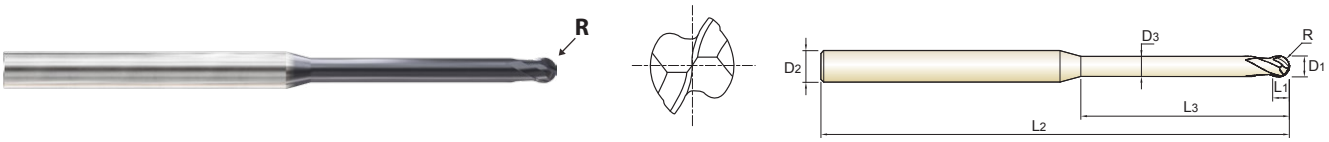
SOLID CARBIDE END MILLS

2 FLUTE BALL NOSE WITH LONG NECK

SERIES

PLAIN SHANK **GMK49**

▶ Ensures smooth chip evacuation and enhanced cutting performance at the ball tip.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.19- p.22

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
	R	D1	D2	L1	L3	L2	D3
GMK4900201	R0.1	0.2	4	0.16	1	40	0.17
GMK4900202	R0.1	0.2	4	0.16	2	40	0.17
GMK4900301	R0.15	0.3	4	0.24	1	40	0.27
GMK4900302	R0.15	0.3	4	0.24	2	40	0.27
GMK4900401	R0.2	0.4	4	0.3	1	40	0.37
GMK49004015	R0.2	0.4	4	0.3	1.5	40	0.37
GMK4900402	R0.2	0.4	4	0.3	2	40	0.37
GMK4900403	R0.2	0.4	4	0.3	3	40	0.37
GMK4900404	R0.2	0.4	4	0.3	4	40	0.37
GMK4900501	R0.25	0.5	4	0.4	1	45	0.45
GMK4900502	R0.25	0.5	4	0.4	2	45	0.45
GMK4900503	R0.25	0.5	4	0.4	3	45	0.45
GMK4900504	R0.25	0.5	4	0.4	4	45	0.45
GMK4900505	R0.25	0.5	4	0.4	5	45	0.45
GMK4900506	R0.25	0.5	4	0.4	6	45	0.45
GMK4900601	R0.3	0.6	4	0.5	1	45	0.55
GMK4900602	R0.3	0.6	4	0.5	2	45	0.55
GMK4900603	R0.3	0.6	4	0.5	3	45	0.55
GMK4900604	R0.3	0.6	4	0.5	4	45	0.55
GMK4900605	R0.3	0.6	4	0.5	5	45	0.55
GMK4900606	R0.3	0.6	4	0.5	6	45	0.55
GMK4900608	R0.3	0.6	4	0.5	8	45	0.55
GMK4900610	R0.3	0.6	4	0.5	10	45	0.55
GMK4900802	R0.4	0.8	4	0.6	2	45	0.75
GMK4900803	R0.4	0.8	4	0.6	3	45	0.75
GMK4900804	R0.4	0.8	4	0.6	4	45	0.75
GMK4900805	R0.4	0.8	4	0.6	5	45	0.75
GMK4900806	R0.4	0.8	4	0.6	6	45	0.75
GMK4900808	R0.4	0.8	4	0.6	8	45	0.75
GMK4900810	R0.4	0.8	4	0.6	10	45	0.75

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	

▶ 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	11.1	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
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	38.1	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
Recommend																		○					○	

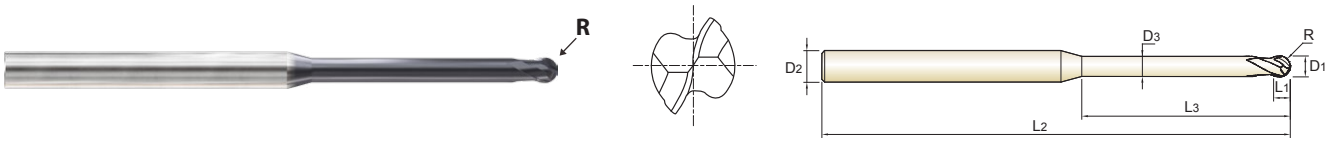
SOLID CARBIDE END MILLS

2 FLUTE BALL NOSE WITH LONG NECK

SERIES

PLAIN SHANK **GMK49**

▶Ensures smooth chip evacuation and enhanced cutting performance at the ball tip.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.19- p.22

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
	R	D_1	D_2	L_1	L_3	L_2	D_3
GMK4901002	R0.5	1.0	4	0.8	2	50	0.95
GMK4901003	R0.5	1.0	4	0.8	3	50	0.95
GMK4901004	R0.5	1.0	4	0.8	4	50	0.95
GMK4901005	R0.5	1.0	4	0.8	5	50	0.95
GMK4901006	R0.5	1.0	4	0.8	6	50	0.95
GMK4901008	R0.5	1.0	4	0.8	8	50	0.95
GMK4901010	R0.5	1.0	4	0.8	10	50	0.95
GMK4901012	R0.5	1.0	4	0.8	12	50	0.95
GMK4901014	R0.5	1.0	4	0.8	14	50	0.95
GMK4901016	R0.5	1.0	4	0.8	16	50	0.95
GMK4901204	R0.6	1.2	4	1	4	50	1.15
GMK4901206	R0.6	1.2	4	1	6	50	1.15
GMK4901208	R0.6	1.2	4	1	8	50	1.15
GMK4901210	R0.6	1.2	4	1	10	50	1.15
GMK4901212	R0.6	1.2	4	1	12	50	1.15
GMK4901504	R0.75	1.5	4	1.2	4	50	1.45
GMK4901506	R0.75	1.5	4	1.2	6	50	1.45
GMK4901508	R0.75	1.5	4	1.2	8	50	1.45
GMK4901510	R0.75	1.5	4	1.2	10	50	1.45
GMK4901512	R0.75	1.5	4	1.2	12	50	1.45
GMK4901514	R0.75	1.5	4	1.2	14	50	1.45
GMK4901516	R0.75	1.5	4	1.2	16	50	1.45
GMK4901520	R0.75	1.5	4	1.2	20	50	1.45
GMK4902004	R1.0	2.0	4	1.6	4	50	1.95
GMK4902006	R1.0	2.0	4	1.6	6	50	1.95
GMK4902008	R1.0	2.0	4	1.6	8	50	1.95
GMK4902010	R1.0	2.0	4	1.6	10	50	1.95
GMK4902012	R1.0	2.0	4	1.6	12	50	1.95
GMK4902014	R1.0	2.0	4	1.6	14	50	1.95
GMK4902016	R1.0	2.0	4	1.6	16	50	1.95

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	

▶ 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	11.1	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
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	38.1	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
Recommend																		○					○	

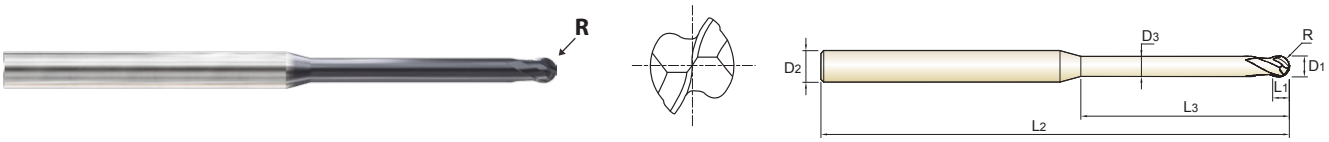
SOLID CARBIDE END MILLS

2 FLUTE BALL NOSE WITH LONG NECK

SERIES

PLAIN SHANK **GMK49**

▶ Ensures smooth chip evacuation and enhanced cutting performance at the ball tip.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.19- p.22

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
	R	D1	D2	L1	L3	L2	D3
GMK4902018	R1.0	2.0	4	1.6	18	50	1.95
GMK4902020	R1.0	2.0	4	1.6	20	50	1.95
GMK4902026	R1.0	2.0	4	1.6	26	60	1.95
GMK4902508	R1.25	2.5	4	2	8	50	2.4
GMK4902510	R1.25	2.5	4	2	10	50	2.4
GMK4902516	R1.25	2.5	4	2	16	50	2.4
GMK4902520	R1.25	2.5	4	2	20	50	2.4
GMK4903006	R1.5	3.0	6	2.4	6	50	2.85
GMK4903008	R1.5	3.0	6	2.4	8	50	2.85
GMK4903010	R1.5	3.0	6	2.4	10	50	2.85
GMK4903012	R1.5	3.0	6	2.4	12	50	2.85
GMK4903016	R1.5	3.0	6	2.4	16	60	2.85
GMK4903018	R1.5	3.0	6	2.4	18	60	2.85
GMK4903020	R1.5	3.0	6	2.4	20	60	2.85
GMK4904008	R2.0	4.0	6	3.2	8	50	3.85
GMK4904010	R2.0	4.0	6	3.2	10	50	3.85
GMK4904012	R2.0	4.0	6	3.2	12	50	3.85
GMK4904016	R2.0	4.0	6	3.2	16	60	3.85
GMK4904020	R2.0	4.0	6	3.2	20	60	3.85
GMK4904022	R2.0	4.0	6	3.2	22	65	3.85
GMK4904030	R2.0	4.0	6	3.2	30	70	3.85
GMK4905015	R2.5	5.0	6	6	15	60	4.85
GMK4905020	R2.5	5.0	6	6	20	60	4.85
GMK4905030	R2.5	5.0	6	6	30	70	4.85
GMK4906020	R3.0	6.0	6	8	20	60	5.85
GMK4906020075	R3.0	6.0	6	12	20	75	5.85
GMK4906020090	R3.0	6.0	6	12	20	90	5.85
GMK4906030	R3.0	6.0	6	8	30	60	5.85
GMK4906030090	R3.0	6.0	6	12	30	90	5.85
GMK4908025	R4.0	8.0	8	10	25	70	7.7

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	

▶ 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	11.1	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
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	38.1	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
Recommend																		○					○	

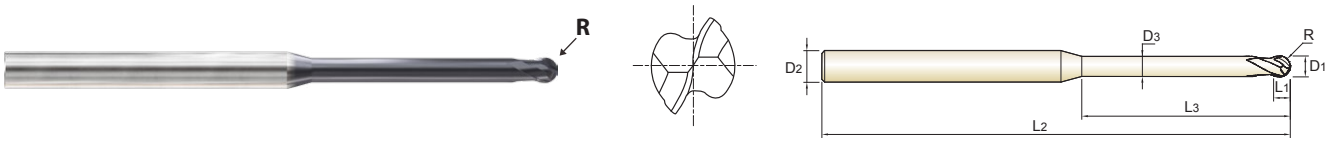
SOLID CARBIDE END MILLS

2 FLUTE BALL NOSE WITH LONG NECK

SERIES

PLAIN SHANK **GMK49**

▶Ensures smooth chip evacuation and enhanced cutting performance at the ball tip.



CARBIDE | 2 | 30° | R ±0.005 | R ±0.010 | PLAIN | Y Coating

p.19- p.22

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
	R	D_1	D_2	L_1	L_3	L_2	D_3
GMK4908025100	R4.0	**8.0**	8	14	25	100	7.7
GMK4908035075	R4.0	**8.0**	8	10	35	75	7.7
GMK4908035100	R4.0	**8.0**	8	14	35	100	7.7
GMK4910030	R5.0	**10.0**	10	12	30	75	9.7
GMK4910030100	R5.0	**10.0**	10	18	30	100	9.7
GMK4910040	R5.0	**10.0**	10	12	40	75	9.7
GMK4910040100	R5.0	**10.0**	10	18	40	100	9.7
GMK4912032	R6.0	**12.0**	12	14	32	80	11.7
GMK4912032110	R6.0	**12.0**	12	22	32	110	11.7
GMK4912045	R6.0	**12.0**	12	14	45	80	11.7
GMK4912045110	R6.0	**12.0**	12	22	45	110	11.7

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	11.1	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
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	38.1	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
Recommend																		○					○	

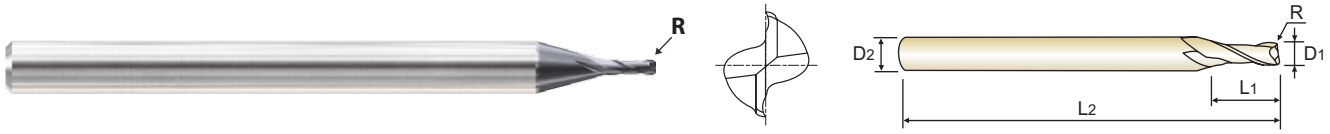
SOLID CARBIDE END MILLS

2 FLUTE CORNER RADIUS

SERIES

PLAIN SHANK **GMK50**

▶Highest Metal Removal Rates and Tool life.



CARBIDE | 2 | 30° | R ±0.010 | PLAIN | Y Coating

p.23

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMK50010014S	R0.1	1.0	4	2.5	50
GMK50010024S	R0.2	1.0	4	2.5	50
GMK50010034S	R0.3	1.0	4	2.5	50
GMK50012014S	R0.1	1.2	4	3	50
GMK50012024S	R0.2	1.2	4	3	50
GMK50012034S	R0.3	1.2	4	3	50
GMK50015014S	R0.1	1.5	4	4	50
GMK50015024S	R0.2	1.5	4	4	50
GMK50015034S	R0.3	1.5	4	4	50
GMK50015054S	R0.5	1.5	4	4	50
GMK50020014S	R0.1	2.0	4	6	50
GMK50020024S	R0.2	2.0	4	6	50
GMK50020034S	R0.3	2.0	4	6	50
GMK50020054S	R0.5	2.0	4	6	50

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.01	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	11.1	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
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	38.1	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
Recommend						○	○	○	○									○					○	

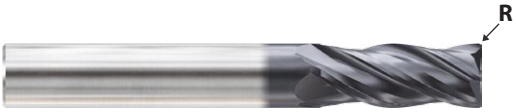
SOLID CARBIDE END MILLS

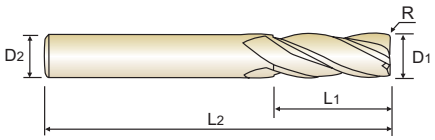
4 FLUTE CORNER RADIUS

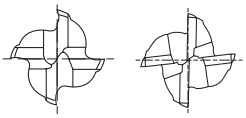
SERIES

PLAIN SHANK **GMK51**

▶Reduces vibration during machining, ensuring superior surface finish and tool life.
▶Highest Metal Removal Rates and Tool life.







p.24

D<Ø3, 30° HELIX

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMK51010014S	R0.1	1.0	4	2.5	50
GMK51010024S	R0.2	1.0	4	2.5	50
GMK51010034S	R0.3	1.0	4	2.5	50
GMK51012014S	R0.1	1.2	4	3	50
GMK51012024S	R0.2	1.2	4	3	50
GMK51012034S	R0.3	1.2	4	3	50
GMK51015024S	R0.2	1.5	4	4	50
GMK51015034S	R0.3	1.5	4	4	50
GMK51015054S	R0.5	1.5	4	4	50
GMK51020024S	R0.2	2.0	4	6	50
GMK51020034S	R0.3	2.0	4	6	50
GMK51020054S	R0.5	2.0	4	6	50
GMK5102502	R0.2	2.5	6	7	60
GMK5102503	R0.3	2.5	6	7	60
GMK5102505	R0.5	2.5	6	7	60
GMK5103002	R0.2	3.0	6	8	60
GMK5103003	R0.3	3.0	6	8	60
GMK5103005	R0.5	3.0	6	8	60
GMK5103010	R1.0	3.0	6	8	60
GMK5103501060	R0.1	3.5	6	10	60
GMK5104002060	R0.2	4.0	6	10	60
GMK5104003060	R0.3	4.0	6	10	60
GMK5104005060	R0.5	4.0	6	10	60
GMK5104010060	R1.0	4.0	6	10	60
GMK5105002070	R0.2	5.0	6	13	70
GMK5105003070	R0.3	5.0	6	13	70
GMK5105005070	R0.5	5.0	6	13	70
GMK5105010070	R1.0	5.0	6	13	70
GMK5106002075	R0.2	6.0	6	13	75
GMK5106003075	R0.3	6.0	6	13	75

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø12	± 0.020	0 ~ - 0.020	h5
over Ø12		0 ~ - 0.030	

▶ 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	11.1	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
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	38.1	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
Recommend																		○					○	

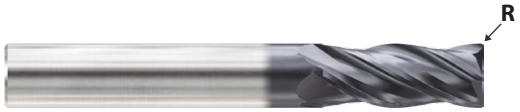
SOLID CARBIDE END MILLS

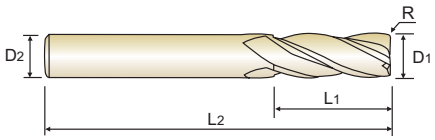
4 FLUTE CORNER RADIUS

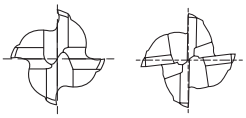
SERIES

PLAIN SHANK **GMK51**

▶Reduces vibration during machining, ensuring superior surface finish and tool life.
▶Highest Metal Removal Rates and Tool life.







CARBIDE | 4 | 30°/33° | R ±0.02 | PLAIN | Y Coating | p.24

D<Ø3, 30° HELIX

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D1	D2	L1	L2
GMK5106005075	R0.5	6.0	6	13	75
GMK5106010075	R1.0	6.0	6	13	75
GMK5108002075	R0.2	8.0	8	19	75
GMK5108003075	R0.3	8.0	8	19	75
GMK5108005075	R0.5	8.0	8	19	75
GMK5108010075	R1.0	8.0	8	19	75
GMK5108020075	R2.0	8.0	8	19	75
GMK5110002	R0.2	10.0	10	22	100
GMK5110003	R0.3	10.0	10	22	100
GMK5110005	R0.5	10.0	10	22	100
GMK5110010	R1.0	10.0	10	22	100
GMK5110020	R2.0	10.0	10	22	100
GMK5112005	R0.5	12.0	12	26	110
GMK5112010	R10	12.0	12	26	110
GMK5112020	R2.0	12.0	12	26	110
GMK5112030	R3.0	12.0	12	26	110
GMK5114005	R0.5	14.0	16	35	150
GMK5114010	R1.0	14.0	16	35	150
GMK5116005	R0.5	16.0	16	32	150
GMK5116010	R1.0	16.0	16	32	150
GMK5116020	R2.0	16.0	16	32	150
GMK5120005	R0.5	20.0	20	38	150
GMK5120010	R1.0	20.0	20	38	150
GMK5120020	R2.0	20.0	20	38	150

Size	Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
up to Ø12	± 0.020	0 ~ - 0.020	h5
over Ø12		0 ~ - 0.030	

◎ : Excellent ○ : Good

ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			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
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	38.1	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
Recommend																		○					○	

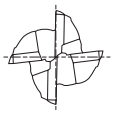
SOLID CARBIDE END MILLS

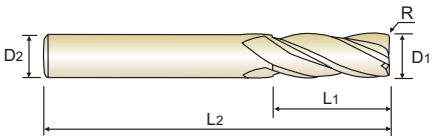
4 FLUTE CORNER RADIUS - HIGH FEED

SERIES

PLAIN SHANK **GMK52**

▶Reduces vibration during machining, ensuring superior surface finish and tool life.
▶Highest Metal Removal Rates and Tool life.





p.25

EDP No.	Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	R	D_1	D_2	L_1	L_2
GMK5204005	R0.5	**4.0**	6	10	50
GMK5206005	R0.5	**6.0**	6	15	60
GMK5206010	R1.0	**6.0**	6	15	60
GMK5208005	R0.5	**8.0**	8	20	70
GMK5208010	R1.0	**8.0**	8	20	70
GMK5210005	R0.5	**10.0**	10	25	75
GMK5210010	R1.0	**10.0**	10	25	75
GMK52120	R0.5	**12.0**	12	30	80
GMK5212010	R1.0	**12.0**	12	30	80

Corner Radius Tolerance (mm)	Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
± 0.020	0 ~ - 0.020	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	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
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	38.1	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
Recommend						○	○	○	○		○	○	○	○	○	○	○	○					○	

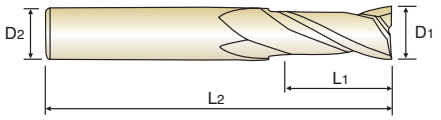
SOLID CARBIDE END MILLS

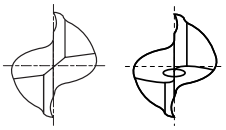
2 FLUTE SQUARE

SERIES

PLAIN SHANK **GMK32**

▶Strengthens the cutting edge by incorporating bottom land touch for improved durability.





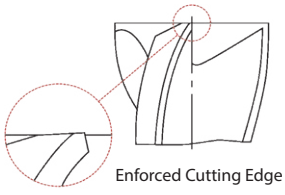
CARBIDE | 2 | 30° | PLAIN | Y Coating

p.26

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D_1	D_2	L_1	L_2
GMK32001	**0.1**	4	0.2	40
GMK320015	**0.15**	4	0.3	40
GMK32002	**0.2**	4	0.4	40
GMK320025	**0.25**	4	0.5	40
GMK32003	**0.3**	4	0.6	40
GMK32005	**0.5**	4	1	40
GMK32006	**0.6**	4	1.2	40
GMK32008	**0.8**	4	1.6	40
GMK320104S	**1.0**	4	2.5	50
GMK320124S	**1.2**	4	3	50
GMK320154S	**1.5**	4	4	50
GMK320164S	**1.6**	4	4	50
GMK320184S	**1.8**	4	4.5	50
GMK320204S	**2.0**	4	6	50
GMK320254S	**2.5**	4	7	50
GMK320304S	**3.0**	4	8	50
GMK320354S	**3.5**	4	10	50
GMK32040	**4.0**	6	10	50
GMK320404S	**4.0**	4	10	50
GMK32045	**4.5**	6	14	50
GMK32050	**5.0**	6	15	60
GMK32055	**5.5**	6	15	60
GMK32060	**6.0**	6	15	60

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	11.1	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
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	38.1	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
Recommend						○	○	○	○									○					○	

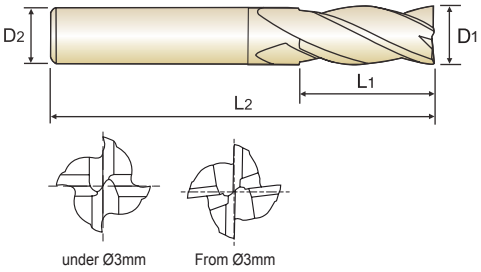
SOLID CARBIDE END MILLS

4 FLUTE SQUARE

SERIES

PLAIN SHANK **GMK33**

▶Reduces vibration during machining, ensuring superior surface finish and tool life.
▶Strengthens the cutting edge by incorporating bottom land touch for improved durability.



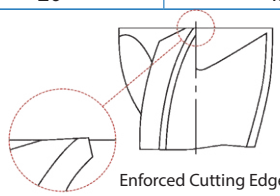
CARBIDE | 4 | 35°/38° | PLAIN | Y Coating | p.27

D<Ø3, 37° HELIX

Unit : mm

EDP No.	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
	D1	D2	L1	L2
GMK330104S	1.0	4	2.5	50
GMK330124S	1.2	4	3	50
GMK330154S	1.5	4	4	50
GMK330204S	2.0	4	6	50
GMK330254S	2.5	4	7	50
GMK330304S	3.0	4	8	50
GMK33030	3.0	6	8	50
GMK330354S	3.5	4	10	50
GMK33035	3.5	6	10	50
GMK330404S	4.0	4	10	50
GMK33040	4.0	6	10	50
GMK33045	4.5	6	14	50
GMK33050	5.0	6	15	60
GMK33055	5.5	6	15	60
GMK33060	6.0	6	15	60
GMK33070	7.0	8	20	60
GMK33080	8.0	8	20	70
GMK33085	8.5	10	22	70
GMK33090	9.0	10	22	70
GMK33100	10.0	10	25	75
GMK33110	11.0	12	30	75
GMK33120	12.0	12	30	80
GMK33140	14.0	16	35	100
GMK33150	15.0	16	38	100
GMK33160	16.0	16	40	100
GMK33180	18.0	16	45	100
GMK33200	20.0	20	45	100

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.020	h5



Enforced Cutting Edge

◎ : Excellent ○ : Good

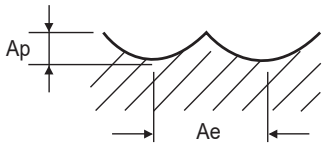
ISO	P												M			K					
Material Description	Non-alloy steel					Low alloy steel				High alloyed steel, and tool steel			Stainless steel			Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11.1	11.2	12	13	14	15	16	17	18	19	20
HRc		13	25	28	32	10	29	32	38	15	35	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
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	38.1	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
Recommend						○	○	○	○		○	○	○	○	○	○	○	○					○	

GMK31 SERIES 2 FLUTE BALL NOSE

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Para meter	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
P	1-4	Non-alloy steel	0.2D	0.1D	Vc	49	72	87	110	119	128	140	155	175	194	213	233
					fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150	0.180
					RPM	15600	15280	13850	14010	12630	10190	8910	8220	6960	6180	5650	4640
					FEED	250	340	720	730	660	710	800	990	1250	1480	1700	1670
	5		0.2D	0.1D	Vc	39	55	65	81	91	103	112	126	141	155	170	184
					fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150	0.180
					RPM	12410	11670	10350	10310	9660	8200	7130	6680	5610	4930	4510	3660
					FEED	200	260	540	540	500	570	640	800	1010	1180	1350	1320
	6-7	Low alloy steel	0.2D	0.1D	Vc	49	72	87	110	119	128	140	155	175	194	213	233
					fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150	0.180
					RPM	15600	15280	13850	14010	12630	10190	8910	8220	6960	6180	5650	4640
					FEED	250	340	720	730	660	710	800	990	1250	1480	1700	1670
	8-9		0.2D	0.1D	Vc	39	55	65	81	91	103	112	126	141	155	170	184
					fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150	0.180
					RPM	12410	11670	10350	10310	9660	8200	7130	6680	5610	4930	4510	3660
					FEED	200	260	540	540	500	570	640	800	1010	1180	1350	1320
	10	High alloyed steel, and tool steel	0.2D	0.1D	Vc	49	72	87	110	119	128	140	155	175	194	213	233
					fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150	0.180
					RPM	15600	15280	13850	14010	12630	10190	8910	8220	6960	6180	5650	4640
					FEED	250	340	720	730	660	710	800	990	1250	1480	1700	1670
	11.1		0.2D	0.1D	Vc	39	55	65	81	91	103	112	126	141	155	170	184
					fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150	0.180
					RPM	12410	11670	10350	10310	9660	8200	7130	6680	5610	4930	4510	3660
					FEED	200	260	540	540	500	570	640	800	1010	1180	1350	1320
	11.2		0.1D	0.1D	Vc	17	24	28	36	42	51	56	58	60	62	64	66
					fz	0.008	0.011	0.026	0.026	0.026	0.035	0.045	0.060	0.090	0.120	0.150	0.180
					RPM	5410	5090	4460	4580	4460	4060	3570	3080	2390	1970	1700	1310
					FEED	90	110	230	240	230	280	320	370	430	470	510	470



GMK49 SERIES 2 FLUTE BALL NOSE with LONG NECK

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
			LBS	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	4.0	6.0	8.0	10.0
P	1-4	Non-alloy steel	Vc	49	49	49	49	44	44	44	39	39	29	72	72	65	65
			fz	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.011	0.011	0.010	0.010
			RPM	15600	15600	15600	15600	14040	14040	14040	12480	12480	9360	15280	15280	13752	13752
			FEED	250	250	250	250	197	197	197	150	150	112	336	336	275	275
			Ap	0.100	0.100	0.070	0.070	0.040	0.040	0.025	0.025	0.015	0.015	0.150	0.105	0.060	0.060
	5		Vc	39	39	39	39	35	35	35	31	31	23	55	55	49	49
			fz	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.011	0.011	0.010	0.010
			RPM	12410	12410	12410	12410	11169	11169	11169	9928	9928	7446	11670	11670	10503	10503
			FEED	199	199	199	199	156	156	156	119	119	89	257	257	210	210
			Ap	0.100	0.100	0.070	0.070	0.040	0.040	0.025	0.025	0.015	0.015	0.150	0.105	0.060	0.060
	6-7	Low alloy steel	Vc	49	49	49	49	44	44	44	39	39	29	72	72	65	65
			fz	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.011	0.011	0.010	0.010
			RPM	15600	15600	15600	15600	14040	14040	14040	12480	12480	9360	15280	15280	13752	13752
			FEED	250	250	250	250	197	197	197	150	150	112	336	336	275	275
			Ap	0.100	0.100	0.070	0.070	0.040	0.040	0.025	0.025	0.015	0.015	0.150	0.105	0.060	0.060
	8-9		Vc	39	39	39	39	35	35	35	31	31	23	55	55	49	49
			fz	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.011	0.011	0.010	0.010
			RPM	12410	12410	12410	12410	11169	11169	11169	9928	9928	7446	11670	11670	10503	10503
			FEED	199	199	199	199	156	156	156	119	119	89	257	257	210	210
			Ap	0.100	0.100	0.070	0.070	0.040	0.040	0.025	0.025	0.015	0.015	0.150	0.105	0.060	0.060
	10	High alloyed steel, and tool steel	Vc	49	49	49	49	44	44	44	39	39	29	72	72	65	65
			fz	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.011	0.011	0.010	0.010
			RPM	15600	15600	15600	15600	14040	14040	14040	12480	12480	9360	15280	15280	13752	13752
			FEED	250	250	250	250	197	197	197	150	150	112	336	336	275	275
			Ap	0.100	0.100	0.070	0.070	0.040	0.040	0.025	0.025	0.015	0.015	0.150	0.105	0.060	0.060
	11.1		Vc	39	39	39	39	35	35	35	31	31	23	55	55	49	49
			fz	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.011	0.011	0.010	0.010
			RPM	12410	12410	12410	12410	11169	11169	11169	9928	9928	7446	11670	11670	10503	10503
			FEED	199	199	199	199	156	156	156	119	119	89	257	257	210	210
			Ap	0.100	0.100	0.070	0.070	0.040	0.040	0.025	0.025	0.015	0.015	0.150	0.105	0.060	0.060
	11.2		Vc	17	17	17	17	15	15	15	14	14	10	24	24	22	22
			fz	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.006	0.006	0.006	0.011	0.011	0.010	0.010
			RPM	5410	5410	5410	5410	4869	4869	4869	4328	4328	3246	5090	5090	4581	4581
			FEED	87	87	87	87	68	68	68	52	52	39	112	112	92	92
			Ap	0.100	0.100	0.070	0.070	0.040	0.040	0.025	0.025	0.015	0.015	0.150	0.105	0.060	0.060

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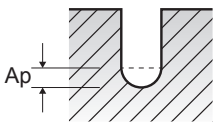

GMK49 SERIES 2 FLUTE BALL NOSE with LONG NECK

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
			LBS	12.0	14.0	16.0	20.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	26.0
P	1-4	Non-alloy steel	Vc	65	65	58	58	87	87	87	87	78	78	78	78	78	70
			fz	0.010	0.010	0.009	0.009	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.023	0.023	0.021
			RPM	13752	13752	12224	12224	13850	13850	13850	13850	12465	12465	12465	12465	12465	11080
			FEED	275	275	220	220	720	720	720	720	573	573	573	573	573	465
			Ap	0.060	0.038	0.038	0.023	0.200	0.200	0.140	0.140	0.080	0.080	0.080	0.050	0.050	0.050
	5		Vc	49	49	44	44	65	65	65	65	59	59	59	59	59	52
			fz	0.010	0.010	0.009	0.009	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.023	0.023	0.021
			RPM	10503	10503	9336	9336	10350	10350	10350	10350	9315	9315	9315	9315	9315	8280
			FEED	210	210	168	168	538	538	538	538	428	428	428	428	428	348
			Ap	0.060	0.038	0.038	0.023	0.200	0.200	0.140	0.140	0.080	0.080	0.080	0.050	0.050	0.050
	6-7	Low alloy steel	Vc	65	65	58	58	87	87	87	87	78	78	78	78	78	70
			fz	0.010	0.010	0.009	0.009	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.023	0.023	0.021
			RPM	13752	13752	12224	12224	13850	13850	13850	13850	12465	12465	12465	12465	12465	11080
			FEED	275	275	220	220	720	720	720	720	573	573	573	573	573	465
			Ap	0.060	0.038	0.038	0.023	0.200	0.200	0.140	0.140	0.080	0.080	0.080	0.050	0.050	0.050
	8-9		Vc	49	49	44	44	65	65	65	65	59	59	59	59	59	52
			fz	0.010	0.010	0.009	0.009	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.023	0.023	0.021
			RPM	10503	10503	9336	9336	10350	10350	10350	10350	9315	9315	9315	9315	9315	8280
			FEED	210	210	168	168	538	538	538	538	428	428	428	428	428	348
			Ap	0.060	0.038	0.038	0.023	0.200	0.200	0.140	0.140	0.080	0.080	0.080	0.050	0.050	0.050
	10	High alloyed steel, and tool steel	Vc	65	65	58	58	87	87	87	87	78	78	78	78	78	70
			fz	0.010	0.010	0.009	0.009	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.023	0.023	0.021
			RPM	13752	13752	12224	12224	13850	13850	13850	13850	12465	12465	12465	12465	12465	11080
			FEED	275	275	220	220	720	720	720	720	573	573	573	573	573	465
			Ap	0.060	0.038	0.038	0.023	0.200	0.200	0.140	0.140	0.080	0.080	0.080	0.050	0.050	0.050
	11.1		Vc	49	49	44	44	65	65	65	65	59	59	59	59	59	52
			fz	0.010	0.010	0.009	0.009	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.023	0.023	0.021
			RPM	10503	10503	9336	9336	10350	10350	10350	10350	9315	9315	9315	9315	9315	8280
			FEED	210	210	168	168	538	538	538	538	428	428	428	428	428	348
			Ap	0.060	0.038	0.038	0.023	0.200	0.200	0.140	0.140	0.080	0.080	0.080	0.050	0.050	0.050
	11.2		Vc	22	22	19	19	28	28	28	28	25	25	25	25	25	22
			fz	0.010	0.010	0.009	0.009	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.023	0.023	0.021
			RPM	4581	4581	4072	4072	4460	4460	4460	4460	4014	4014	4014	4014	4014	3568
			FEED	92	92	73	73	232	232	232	232	185	185	185	185	185	150
			Ap	0.060	0.038	0.038	0.023	0.200	0.200	0.140	0.140	0.080	0.080	0.080	0.050	0.050	0.050

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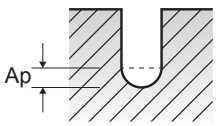

GMK49 SERIES 2 FLUTE BALL NOSE with LONG NECK

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)													
				2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0
			LBS	8.0	10.0	16.0	20.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	8.0	10.0
P	1-4	Non-alloy steel	Vc	110	110	99	99	119	119	119	119	119	107	107	107	128	128
			fz	0.026	0.026	0.023	0.023	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.035	0.035
			RPM	14010	14010	12609	12609	12630	12630	12630	12630	12630	11367	11367	11367	10190	10190
			FEED	729	729	580	580	657	657	657	657	657	523	523	523	713	713
			Ap	0.175	0.175	0.100	0.100	0.300	0.300	0.210	0.210	0.210	0.120	0.120	0.120	0.400	0.400
	5		Vc	81	81	73	73	91	91	91	91	91	82	82	82	103	103
			fz	0.026	0.026	0.023	0.023	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.035	0.035
			RPM	10310	10310	9279	9279	9660	9660	9660	9660	9660	8694	8694	8694	8200	8200
			FEED	536	536	427	427	502	502	502	502	502	400	400	400	574	574
			Ap	0.175	0.175	0.100	0.100	0.300	0.300	0.210	0.210	0.210	0.120	0.120	0.120	0.400	0.400
	6-7	Low alloy steel	Vc	110	110	99	99	119	119	119	119	119	107	107	107	128	128
			fz	0.026	0.026	0.023	0.023	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.035	0.035
			RPM	14010	14010	12609	12609	12630	12630	12630	12630	12630	11367	11367	11367	10190	10190
			FEED	729	729	580	580	657	657	657	657	657	523	523	523	713	713
			Ap	0.175	0.175	0.100	0.100	0.300	0.300	0.210	0.210	0.210	0.120	0.120	0.120	0.400	0.400
	8-9		Vc	81	81	73	73	91	91	91	91	91	82	82	82	103	103
			fz	0.026	0.026	0.023	0.023	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.035	0.035
			RPM	10310	10310	9279	9279	9660	9660	9660	9660	9660	8694	8694	8694	8200	8200
			FEED	536	536	427	427	502	502	502	502	502	400	400	400	574	574
			Ap	0.175	0.175	0.100	0.100	0.300	0.300	0.210	0.210	0.210	0.120	0.120	0.120	0.400	0.400
	10	High alloyed steel, and tool steel	Vc	110	110	99	99	119	119	119	119	119	107	107	107	128	128
			fz	0.026	0.026	0.023	0.023	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.035	0.035
			RPM	14010	14010	12609	12609	12630	12630	12630	12630	12630	11367	11367	11367	10190	10190
			FEED	729	729	580	580	657	657	657	657	657	523	523	523	713	713
			Ap	0.175	0.175	0.100	0.100	0.300	0.300	0.210	0.210	0.210	0.120	0.120	0.120	0.400	0.400
	11.1		Vc	81	81	73	73	91	91	91	91	91	82	82	82	103	103
			fz	0.026	0.026	0.023	0.023	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.035	0.035
			RPM	10310	10310	9279	9279	9660	9660	9660	9660	9660	8694	8694	8694	8200	8200
			FEED	536	536	427	427	502	502	502	502	502	400	400	400	574	574
			Ap	0.175	0.175	0.100	0.100	0.300	0.300	0.210	0.210	0.210	0.120	0.120	0.120	0.400	0.400
	11.2		Vc	36	36	32	32	42	42	42	42	42	38	38	38	51	51
			fz	0.026	0.026	0.023	0.023	0.026	0.026	0.026	0.026	0.026	0.023	0.023	0.023	0.035	0.035
			RPM	4580	4580	4122	4122	4460	4460	4460	4460	4460	4014	4014	4014	4060	4060
			FEED	238	238	190	190	232	232	232	232	232	185	185	185	284	284
			Ap	0.175	0.175	0.100	0.100	0.300	0.300	0.210	0.210	0.210	0.120	0.120	0.120	0.400	0.400

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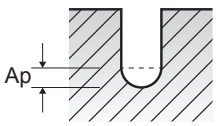

GMK49 SERIES 2 FLUTE BALL NOSE with LONG NECK

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Parameter	Diameter (Ø)															
				4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	6.0	6.0	8.0	8.0	10.0	10.0	12.0	12.0
				LBS	12.0	16.0	20.0	22.0	30.0	15.0	20.0	30.0	20.0	30.0	25.0	35.0	30.0	40.0	32.0	45.0
P	1-4	Non-alloy steel	Vc	128	128	128	115	115	140	140	126	155	155	175	175	194	194	213	213
			fz	0.035	0.035	0.035	0.032	0.032	0.045	0.045	0.041	0.060	0.060	0.090	0.090	0.120	0.120	0.150	0.150
			RPM	10190	10190	10190	9171	9171	8910	8910	8019	8220	8220	6960	6960	6180	6180	5650	5650
			FEED	713	713	713	587	587	802	802	658	986	986	1253	1253	1483	1483	1695	1695
			Ap	0.400	0.280	0.280	0.160	0.160	0.500	0.350	0.200	0.420	0.420	0.560	0.560	1.000	0.700	1.200	0.840
	5		Vc	103	103	103	93	93	112	112	101	126	126	141	141	155	155	170	170
			fz	0.035	0.035	0.035	0.032	0.032	0.045	0.045	0.041	0.060	0.060	0.090	0.090	0.120	0.120	0.150	0.150
			RPM	8200	8200	8200	7380	7380	7130	7130	6417	6680	6680	5610	5610	4930	4930	4510	4510
			FEED	574	574	574	472	472	642	642	526	802	802	1010	1010	1183	1183	1353	1353
			Ap	0.400	0.280	0.280	0.160	0.160	0.500	0.350	0.200	0.420	0.420	0.560	0.560	1.000	0.700	1.200	0.840
	6-7	Low alloy steel	Vc	128	128	128	115	115	140	140	126	155	155	175	175	194	194	213	213
			fz	0.035	0.035	0.035	0.032	0.032	0.045	0.045	0.041	0.060	0.060	0.090	0.090	0.120	0.120	0.150	0.150
			RPM	10190	10190	10190	9171	9171	8910	8910	8019	8220	8220	6960	6960	6180	6180	5650	5650
			FEED	713	713	713	587	587	802	802	658	986	986	1253	1253	1483	1483	1695	1695
			Ap	0.400	0.280	0.280	0.160	0.160	0.500	0.350	0.200	0.420	0.420	0.560	0.560	1.000	0.700	1.200	0.840
	8-9		Vc	103	103	103	93	93	112	112	101	126	126	141	141	155	155	170	170
			fz	0.035	0.035	0.035	0.032	0.032	0.045	0.045	0.041	0.060	0.060	0.090	0.090	0.120	0.120	0.150	0.150
			RPM	8200	8200	8200	7380	7380	7130	7130	6417	6680	6680	5610	5610	4930	4930	4510	4510
			FEED	574	574	574	472	472	642	642	526	802	802	1010	1010	1183	1183	1353	1353
			Ap	0.400	0.280	0.280	0.160	0.160	0.500	0.350	0.200	0.420	0.420	0.560	0.560	1.000	0.700	1.200	0.840
	10	High alloyed steel, and tool steel	Vc	128	128	128	115	115	140	140	126	155	155	175	175	194	194	213	213
			fz	0.035	0.035	0.035	0.032	0.032	0.045	0.045	0.041	0.060	0.060	0.090	0.090	0.120	0.120	0.150	0.150
			RPM	10190	10190	10190	9171	9171	8910	8910	8019	8220	8220	6960	6960	6180	6180	5650	5650
			FEED	713	713	713	587	587	802	802	658	986	986	1253	1253	1483	1483	1695	1695
			Ap	0.400	0.280	0.280	0.160	0.160	0.500	0.350	0.200	0.420	0.420	0.560	0.560	1.000	0.700	1.200	0.840
	11.1		Vc	103	103	103	93	93	112	112	101	126	126	141	141	155	155	170	170
			fz	0.035	0.035	0.035	0.032	0.032	0.045	0.045	0.041	0.060	0.060	0.090	0.090	0.120	0.120	0.150	0.150
			RPM	8200	8200	8200	7380	7380	7130	7130	6417	6680	6680	5610	5610	4930	4930	4510	4510
			FEED	574	574	574	472	472	642	642	526	802	802	1010	1010	1183	1183	1353	1353
			Ap	0.400	0.280	0.280	0.160	0.160	0.500	0.350	0.200	0.420	0.420	0.560	0.560	1.000	0.700	1.200	0.840
	11.2		Vc	51	51	51	46	46	56	56	50	58	58	60	60	62	62	64	64
			fz	0.035	0.035	0.035	0.032	0.032	0.045	0.045	0.041	0.060	0.060	0.090	0.090	0.120	0.120	0.150	0.150
			RPM	4060	4060	4060	3654	3654	3570	3570	3213	3080	3080	2390	2390	1970	1970	1700	1700
			FEED	284	284	284	234	234	321	321	263	370	370	430	430	473	473	510	510
			Ap	0.400	0.280	0.280	0.160	0.160	0.500	0.350	0.200	0.420	0.420	0.560	0.560	1.000	0.700	1.200	0.840

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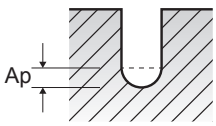
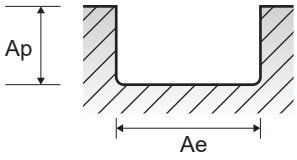


GMK50 SERIES 2 FLUTE CORNER RADIUS - SLOTTING

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

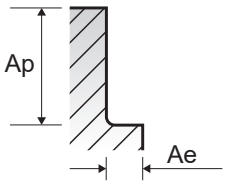
ISO	VDI 3323	Material Description	Ae	Ap	Para meter	Diameter (Ø) 1.0	1.5	2.0
P	1-4	Non-alloy steel	1D	0.2D	Vc	78	93	102
					fz	0.004	0.006	0.007
					RPM	24840	19800	16200
					FEED	216	225	234
	5		1.0D	0.05D	Vc	51	57	65
					fz	0.003	0.004	0.005
					RPM	16200	12150	10404
					FEED	90	99	108
	6-7	Low alloy steel	1D	0.2D	Vc	78	93	102
					fz	0.004	0.006	0.007
					RPM	24840	19800	16200
					FEED	216	225	234
	8-9		1.0D	0.05D	Vc	51	57	65
					fz	0.003	0.004	0.005
					RPM	16200	12150	10404
					FEED	90	99	108
	10	High alloyed steel, and tool steel	1D	0.2D	Vc	78	93	102
					fz	0.004	0.006	0.007
					RPM	24840	19800	16200
					FEED	216	225	234
	11.1 - 11.2		1.0D	0.05D	Vc	51	57	65
					fz	0.003	0.004	0.005
					RPM	16200	12150	10404
					FEED	90	99	108
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	1D	0.2D	Vc	78	93	102
					fz	0.004	0.006	0.007
					RPM	24840	19800	16200
					FEED	216	225	234
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	1D	0.5D	Vc	96	114	126
					fz	0.004	0.007	0.010
					RPM	30558	24192	20053
					FEED	245	338	401
	29.1	Non Metallic Materials (Duroplastic)	1D	0.5D	Vc	96	114	126
					fz	0.004	0.007	0.010
					RPM	30558	24192	20053
					FEED	245	338	401



GMK51 SERIES 4 FLUTE CORNER RADIUS - Side Cutting

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

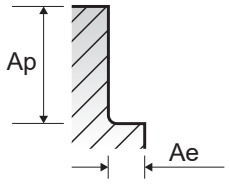
ISO	VDI 3323	Material Description	Ae	Ap	Para meter	Diameter (Ø)											
						1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-4	Non-alloy steel	0.05D	2.0D	Vc	78	93	102	106	112	121	129	134	136	143	140	140	143
					fz	0.003	0.004	0.004	0.006	0.006	0.010	0.012	0.014	0.019	0.023	0.022	0.023	0.023
					RPM	24840	19800	16200	13500	11916	9648	8244	7110	5400	4536	3708	2790	2268
					FEED	270	279	288	297	306	378	387	387	414	414	324	252	207
	5		0.05D	2.0D	Vc	57	64	73	75	81	86	91	95	96	103	105	106	103
					fz	0.003	0.004	0.005	0.007	0.008	0.011	0.016	0.018	0.024	0.027	0.029	0.027	0.027
					RPM	16200	12150	10404	8550	7704	6138	5220	4536	3420	2952	2502	1890	1476
					FEED	198	207	216	225	234	270	324	324	324	324	288	207	162
	6-7	Low alloy steel	0.05D	2.0D	Vc	78	93	102	106	112	121	129	134	136	143	140	140	143
					fz	0.003	0.004	0.004	0.006	0.006	0.010	0.012	0.014	0.019	0.023	0.022	0.023	0.023
					RPM	24840	19800	16200	13500	11916	9648	8244	7110	5400	4536	3708	2790	2268
					FEED	270	279	288	297	306	378	387	387	414	414	324	252	207
	8-9		0.05D	2.0D	Vc	57	64	73	75	81	86	91	95	96	103	105	106	103
					fz	0.003	0.004	0.005	0.007	0.008	0.011	0.016	0.018	0.024	0.027	0.029	0.027	0.027
					RPM	16200	12150	10404	8550	7704	6138	5220	4536	3420	2952	2502	1890	1476
					FEED	198	207	216	225	234	270	324	324	324	324	288	207	162
	10	High alloyed steel, and tool steel	0.05D	2.0D	Vc	78	93	102	106	112	121	129	134	136	143	140	140	143
					fz	0.003	0.004	0.004	0.006	0.006	0.010	0.012	0.014	0.019	0.023	0.022	0.023	0.023
					RPM	24840	19800	16200	13500	11916	9648	8244	7110	5400	4536	3708	2790	2268
					FEED	270	279	288	297	306	378	387	387	414	414	324	252	207
	11.1 - 11.2		0.05D	2.0D	Vc	57	64	73	75	81	86	91	95	96	103	105	106	103
					fz	0.003	0.004	0.005	0.007	0.008	0.011	0.016	0.018	0.024	0.027	0.029	0.027	0.027
					RPM	16200	12150	10404	8550	7704	6138	5220	4536	3420	2952	2502	1890	1476
					FEED	198	207	216	225	234	270	324	324	324	324	288	207	162
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	0.05D	2.0D	Vc	78	93	102	106	112	121	129	134	136	143	140	140	143
					fz	0.003	0.004	0.004	0.006	0.006	0.010	0.012	0.014	0.019	0.023	0.022	0.023	0.023
					RPM	24840	19800	16200	13500	11916	9648	8244	7110	5400	4536	3708	2790	2268
					FEED	270	279	288	297	306	378	387	387	414	414	324	252	207



GMK52 SERIES 4 FLUTE CORNER RADIUS - HIGH FEED - SIDE CUTTING

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

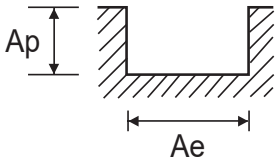
ISO	VDI 3323	Material Description	Ae	Ap	Para meter	Diameter (Ø) 4.0	6.0	8.0	10.0	12.0
P	1-4	Non-alloy steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	122	122	122	134	134
					fz	0.008	0.016	0.027	0.038	0.047
					RPM	9708	6472	4854	4265	3554
					FEED	311	414	524	648	668
	5		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	86	86	86	94	94
					fz	0.008	0.016	0.027	0.038	0.047
					RPM	6844	4562	3422	2992	2493
					FEED	219	292	370	455	469
	6-7	Low alloy steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	122	122	122	134	134
					fz	0.008	0.016	0.027	0.038	0.047
					RPM	9708	6472	4854	4265	3554
					FEED	311	414	524	648	668
	8-9		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	86	86	86	94	94
					fz	0.008	0.016	0.027	0.038	0.047
					RPM	6844	4562	3422	2992	2493
					FEED	219	292	370	455	469
	10	High alloyed steel, and tool steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	122	122	122	134	134
					fz	0.008	0.016	0.027	0.038	0.047
					RPM	9708	6472	4854	4265	3554
					FEED	311	414	524	648	668
	11.1		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	86	86	86	94	94
					fz	0.008	0.016	0.027	0.038	0.047
					RPM	6844	4562	3422	2992	2493
					FEED	219	292	370	455	469
	11.2		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	51	51	51	56	56
					fz	0.006	0.011	0.019	0.027	0.032
					RPM	4058	2706	2029	1783	1485
					FEED	97	119	154	193	190
M	12 - 13	Stainless steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	129	129	129	129	129
					fz	0.006	0.013	0.022	0.034	0.040
					RPM	10265	6844	5133	4106	3422
					FEED	246	356	452	558	548
	14.1		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	92	92	92	92	92
					fz	0.008	0.018	0.028	0.048	0.056
					RPM	7321	4881	3661	2928	2440
					FEED	234	351	410	562	547
	14.2		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	83	83	83	83	83
					fz	0.008	0.018	0.028	0.048	0.055
					RPM	6605	4403	3302	2642	2202
					FEED	211	317	370	507	484
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	90	90	90	98	98
					fz	0.010	0.020	0.034	0.048	0.058
					RPM	7162	4775	3581	3119	2600
						286	382	487	599	603
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	Vc	132	126	132	126	126
					fz	0.029	0.048	0.063	0.081	0.096
					RPM	10504	6685	5252	4011	3342
					FEED	1218	1284	1324	1300	1283
	29.1	Non Metallic Materials (Duroplastic)	0.1D	1.5D	Vc	132	126	132	126	126
					fz	0.029	0.048	0.063	0.081	0.096
					RPM	10504	6685	5252	4011	3342
					FEED	1218	1284	1324	1300	1283
S	31 - 35	Heat Resistant Super Alloys	D<3 : 0.1D D≥3 : 0.2D	1.0D	Vc	25	25	25	25	25
					fz	0.007	0.018	0.031	0.047	0.055
					RPM	1989	1326	995	796	663
					FEED	56	95	123	150	146
	36 - 37	Titanium Alloys	D<3 : 0.1D D≥3 : 0.3D	1.0D	Vc	65	65	65	65	65
					fz	0.007	0.016	0.025	0.043	0.050
					RPM	5173	3448	2586	2069	1724
					FEED	145	221	259	356	345



GMK32 SERIES 2 FLUTE SQUARE - SLOTTING

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

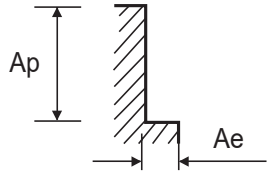
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø) 0.5	0.6	0.8	1.0	2.0	3.0	4.0	5.0	6.0
P	1-4	Non-alloy steel	1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	55	58	61	66	71	81	92	96	102
					fz	0.002	0.002	0.003	0.004	0.008	0.012	0.020	0.025	0.031
					RPM	35200	30880	24320	21010	11300	8590	7320	6110	5410
					FEED	140	120	145	170	180	210	290	310	340
	5		1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	33	35	37	40	47	50	56	57	61
					fz	0.002	0.002	0.003	0.004	0.008	0.013	0.019	0.025	0.033
					RPM	21000	18530	14670	12730	7480	5310	4460	3630	3240
					FEED	80	75	85	100	120	140	170	180	210
	6-7	Low alloy steel	1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	55	58	61	66	71	81	92	96	102
					fz	0.002	0.002	0.003	0.004	0.008	0.012	0.020	0.025	0.031
					RPM	35200	30880	24320	21010	11300	8590	7320	6110	5410
					FEED	140	120	145	170	180	210	290	310	340
	8-9		1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	33	35	37	40	47	50	56	57	61
					fz	0.002	0.002	0.003	0.004	0.008	0.013	0.019	0.025	0.033
					RPM	21000	18530	14670	12730	7480	5310	4460	3630	3240
					FEED	80	75	85	100	120	140	170	180	210
	10	High alloyed steel, and tool steel	1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	55	58	61	66	71	81	92	96	102
					fz	0.002	0.002	0.003	0.004	0.008	0.012	0.020	0.025	0.031
					RPM	35200	30880	24320	21010	11300	8590	7320	6110	5410
					FEED	140	120	145	170	180	210	290	310	340
	11.1 - 11.2		1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	33	35	37	40	47	50	56	57	61
					fz	0.002	0.002	0.003	0.004	0.008	0.013	0.019	0.025	0.033
					RPM	21000	18530	14670	12730	7480	5310	4460	3630	3240
					FEED	80	75	85	100	120	140	170	180	210
M	14.1	Stainless steel	1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	27	29	30	33	39	43	48	49	52
					fz	0.002	0.002	0.003	0.004	0.007	0.013	0.019	0.025	0.032
					RPM	17300	15440	11970	10500	6210	4560	3820	3120	2760
					FEED	70	65	75	80	90	120	150	160	180
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	1.0D	0.5D D≤3 : 0.2D D<1 : 0.15D	Vc	55	58	61	66	71	81	92	96	102
					fz	0.002	0.002	0.003	0.004	0.008	0.012	0.020	0.025	0.031
					RPM	35200	30880	24320	21010	11300	8590	7320	6110	5410
					FEED	140	120	145	170	180	210	290	310	340
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	1.0D	D≥1 : 0.5D D<1 : 0.2D	Vc	80	83	90	96	126	126	132	126	126
					fz	0.001	0.001	0.003	0.004	0.010	0.015	0.019	0.025	0.033
					RPM	50930	44000	35800	30560	20050	13370	10500	8020	6680
					FEED	102	120	185	240	400	400	400	400	440
	29.1	Non Metallic Materials (Duroplastic)	1.0D	D≥1 : 0.5D D<1 : 0.2D	Vc	80	83	90	96	126	126	132	126	126
					fz	0.001	0.001	0.003	0.004	0.010	0.015	0.019	0.025	0.033
					RPM	50930	44000	35800	30560	20050	13370	10500	8020	6680
					FEED	102	120	185	240	400	400	400	400	440



GMK33 SERIES 4 FLUTE SQUARE - SIDE CUTTING

Vc = m/min. fz = mm/tooth
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Para meter	Diameter (Ø) 1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
P	1-4	Non-alloy steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	91	122	122	122	122	122	122	134	134	134	134	134	134
					fz	0.002	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065
					RPM	28966	19417	12945	9708	7767	6472	4854	4265	3554	3047	2666	2370	2133
					FEED	174	233	259	311	342	414	524	648	668	597	565	559	555
	5		D≤3 : 0.1D D>3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	64	86	86	86	86	86	86	94	94	94	94	94	94
					fz	0.002	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065
					RPM	20372	13687	9125	6844	5475	4562	3422	2992	2493	2137	1870	1662	1496
					FEED	122	164	183	219	241	292	370	455	469	419	396	392	389
	6-7	Low alloy steel	D≤3 : 0.1D D>3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	91	122	122	122	122	122	122	134	134	134	134	134	134
					fz	0.002	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065
					RPM	28966	19417	12945	9708	7767	6472	4854	4265	3554	3047	2666	2370	2133
					FEED	174	233	259	311	342	414	524	648	668	597	565	559	555
	8-9		D≤3 : 0.1D D>3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	64	86	86	86	86	86	86	94	94	94	94	94	94
					fz	0.002	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065
					RPM	20372	13687	9125	6844	5475	4562	3422	2992	2493	2137	1870	1662	1496
					FEED	122	164	183	219	241	292	370	455	469	419	396	392	389
	10	High alloyed steel, and tool steel	D≤3 : 0.1D D>3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	91	122	122	122	122	122	122	134	134	134	134	134	134
					fz	0.002	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065
					RPM	28966	19417	12945	9708	7767	6472	4854	4265	3554	3047	2666	2370	2133
					FEED	174	233	259	311	342	414	524	648	668	597	565	559	555
	11.1		D≤3 : 0.1D D>3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	64	86	86	86	86	86	86	94	94	94	94	94	94
					fz	0.002	0.003	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065
					RPM	20372	13687	9125	6844	5475	4562	3422	2992	2493	2137	1870	1662	1496
					FEED	122	164	183	219	241	292	370	455	469	419	396	392	389
	11.2		D≤3 : 0.1D D>3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	38	51	51	51	51	51	51	56	56	56	56	56	56
					fz	0.001	0.002	0.003	0.006	0.008	0.011	0.019	0.027	0.032	0.034	0.037	0.041	0.045
					RPM	12096	8117	5411	4058	3247	2706	2029	1783	1485	1273	1114	990	891
					FEED	48	65	65	97	104	119	154	193	190	173	165	162	160
M	12 - 13	Stainless steel	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	97	129	129	129	129	129	129	129	129	129	129	129	129
					fz	0.001	0.003	0.004	0.006	0.009	0.013	0.022	0.034	0.040	0.043	0.045	0.050	0.055
					RPM	30876	20531	13687	10265	8212	6844	5133	4106	3422	2933	2566	2281	2053
					FEED	124	205	219	246	296	356	452	558	548	504	462	456	452
	14.1		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	69	92	92	92	92	92	92	92	92	92	92	92	92
					fz	0.002	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.056	0.060	0.063	0.070	0.077
					RPM	21963	14642	9762	7321	5857	4881	3661	2928	2440	2092	1830	1627	1464
					FEED	132	176	195	234	305	351	410	562	547	502	461	456	451
	14.2		D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	62	83	83	83	83	83	83	83	83	83	83	83	83
					fz	0.002	0.003	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.059	0.062	0.069	0.077
					RPM	19735	13210	8807	6605	5284	4403	3302	2642	2202	1887	1651	1468	1321
					FEED	118	159	176	211	275	317	370	507	484	445	409	405	407
K	15 - 20	Grey cast iron Nodular cast iron Malleable cast iron	D<3 : 0.1D D≥3 : 0.3D	D<3 : 1.0D D≥3 : 1.5D	Vc	67	90	90	90	90	90	90	98	98	98	98	98	98
					fz	0.002	0.004	0.006	0.010	0.014	0.020	0.034	0.048	0.058	0.061	0.065	0.073	0.081
					RPM	21327	14324	9549	7162	5730	4775	3581	3119	2600	2228	1950	1733	1560
					FEED	171	229	229	286	321	382	487	599	603	544	507	506	505
N	26 - 28	Copper and Copper Alloys (Bronze / Brass)	0.1D	1.5D	Vc	96	126	126	132	126	126	132	126	126	126	132	126	126
					fz	0.006	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096	0.115	0.125	0.144	0.162
					RPM	30558	20054	13369	10504	8021	6685	5252	4011	3342	2865	2626	2228	2005
					FEED	733	1283	1283	1218	1219	1284	1324	1300	1283	1318	1313	1283	1299
	29.1	Non Metallic Materials (Duroplastic)	0.1D	1.5D	Vc	96	126	126	132	126	126	132	126	126	126	132	126	126
					fz	0.006	0.016	0.024	0.029	0.038	0.048	0.063	0.081	0.096	0.115	0.125	0.144	0.162
					RPM	30558	20054	13369	10504	8021	6685	5252	4011	3342	2865	2626	2228	2005
					FEED	733	1283	1283	1218	1219	1284	1324	1300	1283	1318	1313	1283	1299
S	31 - 35	Heat Resistant Super Alloys	D<3 : 0.1D D≥3 : 0.2D	1.0D	Vc	18	25	25	25	25	25	25	25	25	25	25	25	25
					fz	0.002	0.003	0.005	0.007	0.012	0.018	0.031	0.047	0.055	0.061	0.064	0.069	0.077
					RPM	5730	3979	2653	1989	1592	1326	995	796	663	568	497	442	398
					FEED	34	48	53	56	76	95	123	150	146	139	127	122	123
	36 - 37	Titanium Alloys	D<3 : 0.1D D≥3 : 0.3D	1.0D	Vc	49	65	65	65	65	65	65	65	65	65	65	65	65
					fz	0.001	0.002	0.004	0.007	0.011	0.016	0.025	0.043	0.050	0.053	0.056	0.062	0.069
					RPM	15597	10345	6897	5173	4138	3448	2586	2069	1724	1478	1293	1149	1035
					FEED	62	83	110	145	182	221	259	356	345	313	290	285	286



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