ISO 9001 / ISO 14001

WORLD CLASS PRODUCT OF KOREA 세계일류상품

YG TAP PRIME

HSS-PM(Powder Metallurgy) Premium Taps
升级的粉末冶金高速钢丝锥

- Premium Spiral Point and Spiral Flute Taps for CNC Machines
  适合数控机床使用的优质先端丝锥和螺旋槽丝锥
- High and Reliable Performance on Various Ductile Materials
  针对多种延展性材料具有高性能和可靠性

YG-1 CO., LTD.

HEAD OFFICE

13-40, Songdogwahak-ro 16beon-gil, Yeonsu-gu, Incheon 21984, South Korea

Notice YG-1 Global head office is relocating from December 2020 to a new address as above;

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https://www.yg1.kr E-mail: yg1@yg1.kr

YouTube

Search 'YG-1' on social media outlets

YG1YAPT221026001

New Prime X-Coated Tap for CNC Machining in Various Ductile Materials
用于多种延展性材料数控加工的新型Prime X涂层丝锥

Special grinding process provides a unique geometry for spiral flute and spiral point taps with optimal flute space for improved chip evacuation

特殊的磨削工艺使得螺旋槽丝锥和先端丝锥具有独特的几何槽型，优化的槽型改善了排屑性能。

Spiral Flute 螺旋

Spiral Point 螺尖

GUIDE TO ICONS 标记的说明

Working Material 切削工件

Material groups MU — Multi-Purpose 多功能

Helix Angle 螺旋角

R45

Chamfer Lead 倒角长度

4P~5P — with Spiral Point and Chamfer Lead 4-5 Thread

2P~3P — Chamfer Lead 2-3 Thread

Surface Treatment 表面处理

X Coating — YG-1 X-Coating
YG-1 X-涂层

Thread Angle 螺纹角

60°

Tool Raw Material 工具材质

HSS PM — YG-1 Premium Powder Metallurgy HSS
YG-1超细粉末高速钢

Tap Limits 螺纹等级

YH

Cutting Condition 切削条件

FEATURES & BENEFITS 特点及优势

High and Reliable Performance on Various Ductile Materials
针对多种延展性材料具有高性能和可靠性

YG-1 Special Thread Structure
YG-1 特殊牙型结构

- **Reduction in torque, wear, and the risk of over feeding** as compared to conventional taps
  与传统丝锥相比，减少扭矩、磨损和过切的风险

Extra Short Threaded Body and Recess
超短螺纹长度及避让

- **Minimize bird nesting, reduced chipping, improved thread finish**
  小化切屑堆积，降低崩刃风险，提高螺纹光洁度

Spiral Flute
螺旋槽丝锥

Spiral Point
先端丝锥

Optimized Edge Preparation
优化的刃口处理

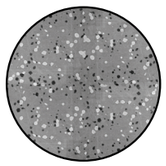
- **Consistent performance and process stability** to Prevent chipping
  稳定的性能和工艺稳定性防止崩刃

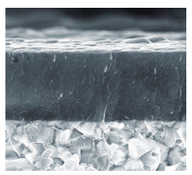
Optimized Flute Geometry for Excellent Chip Flow
优化的槽型更有利于排屑

- **Increased tool life as a result of an optimum combination of material, geometry,** and coating which gives Unrestricted chip flow
  优化材料、槽型和涂层的最佳组合使得排屑顺畅，有利于提高刀具的寿命。

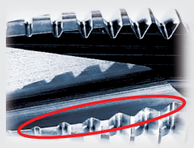
HSS-PM(Powder Metallurgy) Premium Taps
粉末冶金高速钢优质丝锥

Powdered Metal Technology for a tough-chipping resistant cutting edge for long tool life and reliable thread finish
粉末冶金技术为切削刃抗崩性，长的刀具寿命及稳定的螺纹光洁度提供保障





YG-1's X-Coating
YG-1's High Performance Coating for high heat and wear resistance
YG-1高耐热性和耐磨性的高性能涂层



Premium Cutting Edge Strength
优质的切削刃强度

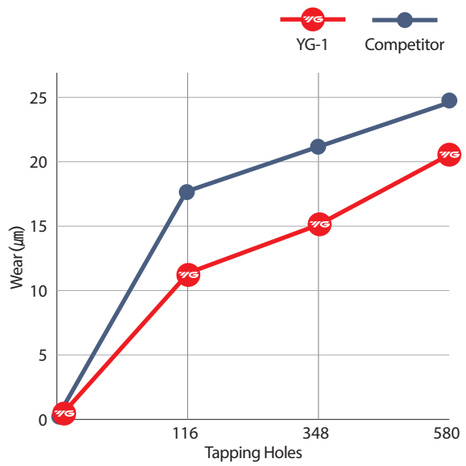
- More controlled structure with high wear resistance
  具有高耐磨性的可控结构
- Consistent performance and process stability with chipping resistance
  一致的性能和工艺稳定性以及抗崩性

CASE STUDY 案例分析

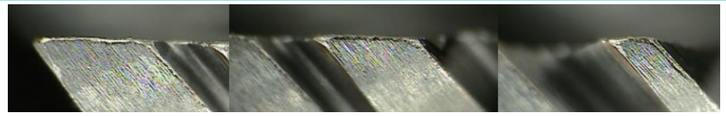
TEST I SPIRAL FLUTE TAP (M4x0.7)

Cutting Condition 加工条件

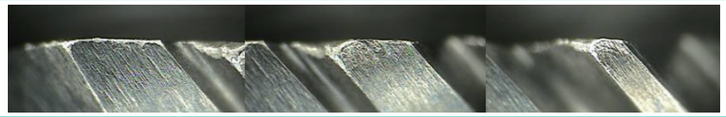
Tool 工具	Spiral Flute Tap
Size 规格	M4x0.7
Work Material 工件材质	JIS: SCM440(HRc30) / DIN : 42CrMo4 / WR : 1.7225
RPM 转速	2387 rev/min
Vc 螺纹速度	30 m/min.
Feed 进给	0.7 mm/rev.
Tap Drill Size 螺纹低孔尺寸	Ø3.3mm
Tapping depth 钻孔深度	8mm
Tapping holes 螺纹孔	580
Coolant 冷却	Wet Cut



YG-1 (580 Holes)



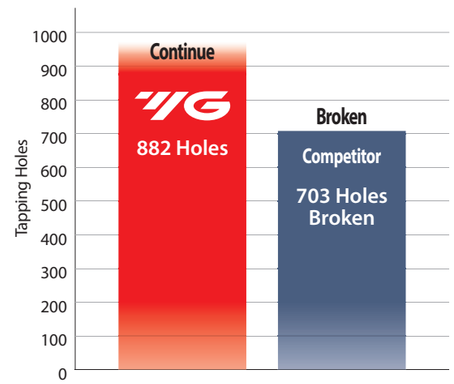
Competitor (580 Holes)



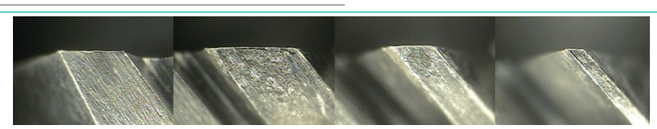
TEST II SPIRAL FLUTE TAP (M6x1.0)

Cutting Condition 加工条件

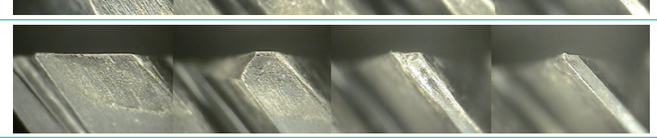
Tool 工具	Spiral Flute Tap
Size 规格	M6x1.0
Work Material 工件材质	JIS: SUS316Ti / DIN : X6CrNiMoTi17-12-2 / WR : 1.4571
RPM 转速	531 rev/min
Vc 螺纹速度	10 m/min
Feed 进给	1.0mm/rev.
Tap Drill Size 螺纹低孔尺寸	Ø5.1mm
Tapping depth 钻孔深度	12.0mm
Tapping holes 螺纹孔	YG-1: 882+α / Competitor : 703
Coolant 冷却	Wet Cut



YG-1 (882 Holes)



Competitor (703 Holes, Broken)

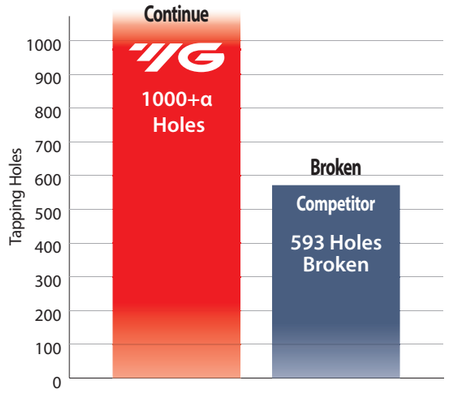


CASE STUDY 案例分析

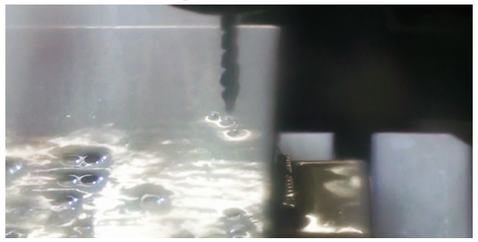
TEST III SPIRAL FLUTE TAP (M6x1.0)

Cutting Condition 加工条件

Tool 工具	Sprial Flute Tap
Size 规格	M6x1.0
Work Material 工件材质	JIS: SUS304 / DIN: X16CrNi1810 / WR: 1.4350
RPM 转速	531 rev/min.
Vc 螺纹速度	10 m/min.
Feed 进给	531 mm/min.
Tap Drill Size 螺纹低孔尺寸	5.1mm
Tapping depth 钻孔深度	12 mm
Tapping holes 螺纹孔	YG-1: 1000+α / Competitor: 593
Coolant 冷却	Wet Cut



Prime Taps (1000 Holes+α)

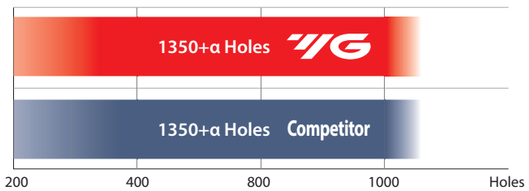


Competitor (593 Holes, Broken)

TEST IV SPIRAL FLUTE TAP (M8x1.25)

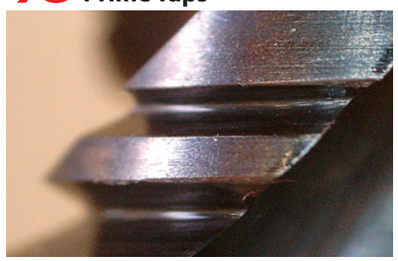
Cutting Condition 加工条件

Tool 工具	Sprial Flute Tap
Size 规格	M8x1.25
Work Material 工件材质	JIS: S45C / DIN: CK45 / WR: 1.1191
RPM 转速	796 rev/min
Vc 螺纹速度	20 m/min
Feed 进给	995 mm/min
Tap Drill Size 螺纹低孔尺寸	6.8mm
Tapping depth 钻孔深度	17 mm
Tapping holes 螺纹孔	YG-1: 1350+α / Competitor: 1350+α
Coolant 冷却	Wet Cut

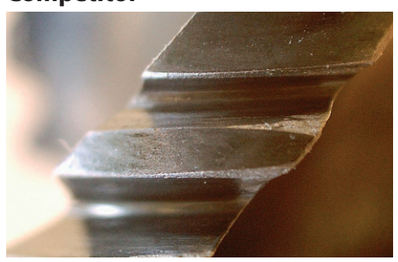


Comparison of Wear Resistance

Prime Taps



Competitor



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SELECTION GUIDE 选用指南

YG THREADING TOOLS

HSS-PM PRIME TAPS

Premium Spiral Point and Spiral Flute Taps
High Performance in Various Ductile Materials

优质先端丝锥和螺旋槽丝锥
针对多种延展性材料具有高性能

Please visit globalyg1.com/mat for material search

◎ : Excellent (优秀) ○ : Good (良好)

HOLE TYPE 孔类型		Max. 2.5xD Blind Hole 盲孔	Max. 3.0xD Through Hole 通孔
TOOL MATERIAL 工具材料		HSS-PM	
CHAMFER LEAD ACC. TO DIN2197 倒角长度		2P-3P	4P-5P
FLUTE TYPE 槽型		Spiral Flute 螺旋	Spiral Point 螺尖
SPIRAL FLUTE ANGLE 螺旋		R45	-
SERIES 系列号 (page 页数)	JIS Type	I	I
	M/MF	**TRD23** (P. 8)	**TRG15** (P. 9)
	UNC/UNF		
	W		
	M-LH W-LH		
	PIPE TAPS		
SURFACE TREATMENT 表面处理		X-coating	
MODEL 模型			

ISO 公制	VDI 3323	Material Description 材料描述	Composition / Structure / Heat Treatment 成分 / 组织 / 热处理		HB 布氏硬度	HRc 硬度	Recommended cutting conditions Vc (m/min.)			
P	1	Non-alloy steel	About 0.15% C	Annealed	125		○	5-20	◎	15-45
	2		About 0.45% C	Annealed	190	13	◎	10-50	◎	10-55
	3		About 0.45% C	Quenched & Tempered	250	25	◎	10-50	◎	10-55
	4		About 0.75% C	Annealed	270	28	◎	15-40	◎	15-50
	5		About 0.75% C	Quenched & Tempered	300	32	◎	15-40	◎	15-50
	6	Low alloy steel		Annealed	180	10	◎	8-30	◎	8-30
	7			Quenched & Tempered	275	29	◎	8-30	◎	8-30
	8			Quenched & Tempered	300	32	◎	8-30	◎	8-30
	9			Quenched & Tempered	350	38	○	8-30	◎	8-30
	10	High alloyed steel, and tool steel		Annealed	200	15	○	8-30	○	8-30
	11			Quenched & Tempered	325	35	○	8-30	○	8-30
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15	◎	5-15	◎	8-20
	13		Martensitic	Quenched & Tempered	240	23	◎	5-15	◎	8-20
	14		Austenitic		180	10	◎	5-15	◎	8-20
K	15	Grey cast iron	Pearlitic / ferritic		180	10	○	15-35	◎	15-35
	16		Pearlitic (Martensitic)		260	26	○	15-35	◎	15-35
	17	Nodular cast iron	Ferritic		160	3	◎	15-35	◎	15-35
	18		Pearlitic		250	25	◎	15-35	◎	15-35
	19	Malleable cast iron	Ferritic		130					
	20		Pearlitic		230	21				
N	21	Aluminum-wrought alloy	Not Curable		60		○	15-35	○	15-35
	22		Curable	Hardened	100		○	15-35	○	15-35
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	15-35	◎	15-35
	24		≤ 12% Si, Curable	Hardened	90		◎	15-35	◎	15-35
	25		> 12% Si, Not Curable		130		○	15-35	○	15-35
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		◎	15-35	◎	15-35
	27		CuZn, CuSnZn (Brass)		90		◎	15-35	◎	15-35
	28		CuSn, lead-free copper and electrolytic copper		100		◎	15-35	◎	15-35
	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				

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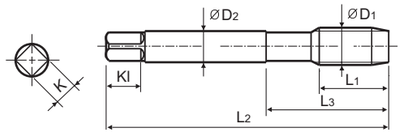
X-coating, Without Coolant (Metric & Metric Fine)

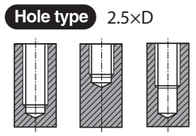
Spiral Flute Taps for Multi Purpose

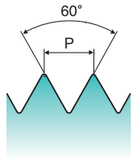
多用途螺旋槽丝锥

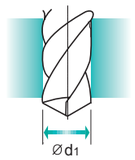
TRD23 SERIES

- ▶ High performance on various ductile materials
  在各种延展性材料上具有高性能
- ▶ Specially designed to prevent oversized threads and reduce gauging problems
  特殊设计防止螺纹过切及减少量规问题









Material groups **MU** | HSS PM | I | YH | 60° | 2P~3P | R45 | X Coating | p.7

Machine Taps

Unit(单位) : mm

SIZE 尺寸 ØD1		Pitch 牙距 P	EDP No. 型号	Limits 精度	Thread Length 螺纹长 L1	Overall Length 全长 L2	Neck Length 颈长 L3	Shank Diameter 柄径 ØD2	Square Size 方块尺寸 K	Square Length 方块长度 Kl	No. of Flute 槽数 Z	Tapping Drill Diameter 前孔直径 Ød1
M2	x	0.4	**TRD23131GS**	YH1.5	3.2	40.0	10.0	3.0	2.5	5.0	2	1.6
M2.5	x	0.45	**TRD23172GS**	YH2	3.6	44.0	13.0	3.0	2.5	5.0	2	2.1
M3	x	0.5	**TRD23202GS**	YH2	4.0	46.0	18.0	4.0	3.2	6.0	3	2.5
M4	x	0.7	**TRD23243GS**	YH3	5.6	52.0	20.0	5.0	4.0	7.0	3	3.3
M5	x	0.8	**TRD23283GS**	YH3	6.4	60.0	25.0	5.5	4.5	7.0	3	4.2
M6	x	1.0	**TRD23313GS**	YH3	8.0	62.0	28.0	6.0	4.5	7.0	3	5.0
M6	x	0.5	**TRD23332GS**	YH2	8.0	62.0	28.0	6.0	4.5	7.0	3	5.5
M8	x	1.25	**TRD23363GS**	YH3	15.0	70.0	35.0	6.2	5.0	8.0	3	6.8
M8	x	1.0	**TRD23373GS**	YH3	12.0	70.0	35.0	6.2	5.0	8.0	3	7.0
M10	x	1.5	**TRD23423GS**	YH3	18.0	75.0	39.0	7.0	5.5	8.0	3	8.5
M10	x	1.25	**TRD23433GS**	YH3	15.0	75.0	39.0	7.0	5.5	8.0	3	8.8
M10	x	1.0	**TRD23443GS**	YH3	15.0	75.0	39.0	7.0	5.5	8.0	3	9.0
M12	x	1.75	**TRD23504GS**	YH4	21.0	82.0	46.0	8.5	6.5	9.0	3	10.3
M12	x	1.5	**TRD23513GS**	YH3	18.0	82.0	46.0	8.5	6.5	9.0	3	10.5
M12	x	1.25	**TRD23523GS**	YH3	18.0	82.0	46.0	8.5	6.5	9.0	3	10.8
M12	x	1.0	**TRD23533GS**	YH3	18.0	82.0	46.0	8.5	6.5	9.0	3	11.0
M14	x	2.0	**TRD23544GS**	YH4	24.0	88.0	46.0	10.5	8.0	11.0	3	12.0
M14	x	1.5	**TRD23553GS**	YH3	18.0	88.0	46.0	10.5	8.0	11.0	3	12.5
M16	x	2.0	**TRD23604GS**	YH4	24.0	95.0	50.0	12.5	10.0	13.0	3	14.0
M16	x	1.5	**TRD23613GS**	YH3	18.0	95.0	50.0	12.5	10.0	13.0	3	14.5
M18	x	2.5	**TRD23655GS**	YH5	30.0	100.0	55.0	14.0	11.0	14.0	4	15.5
M18	x	1.5	**TRD23674GS**	YH4	24.0	100.0	55.0	14.0	11.0	14.0	4	16.5
M20	x	2.5	**TRD23705GS**	YH5	30.0	105.0	56.0	15.0	12.0	15.0	4	17.5
M20	x	1.5	**TRD23724GS**	YH4	24.0	105.0	56.0	15.0	12.0	15.0	4	18.5

◎ : Excellent(优秀) ○ : Good(良好)

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

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

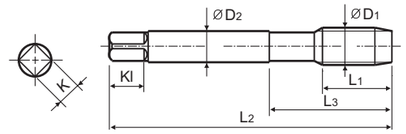
X-coating, Without Coolant (Metric & Metric Fine)

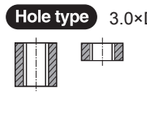
Spiral Point Taps for Multi Purpose

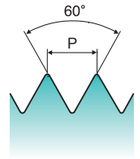
多用途先端丝锥

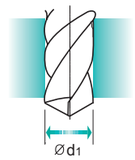
TRG15 SERIES

- ▶ High performance on various ductile materials
  在各种延展性材料上具有高性能
- ▶ Specially designed to prevent oversized threads and reduce gauging problems
  特殊设计防止螺纹过切及减少量规问题









Material groups **MU** | HSS PM | I | YH | 60° | 4P~5P | X Coating | p.7

Machine Taps

Unit(单位) : mm

SIZE 尺寸 ØD1		Pitch 牙距 P	EDP No. 型号	Limits 精度	Thread Length 螺纹长 L1	Overall Length 全长 L2	Neck Length 颈长 L3	Shank Diameter 柄径 ØD2	Square Size 方块尺寸 K	Square Length 方块长度 Kl	No. of Flute 槽数 Z	Tapping Drill Diameter 前孔直径 Ød1
M2	x	0.4	**TRG15131GS**	YH1.5	9.5	40.0	15.0	3.0	2.5	5.0	2	1.6
M2.5	x	0.45	**TRG15172GS**	YH2	9.5	44.0	16.0	3.0	2.5	5.0	2	2.1
M3	x	0.5	**TRG15203GS**	YH3	11.0	46.0	18.0	4.0	3.2	6.0	3	2.5
M4	x	0.7	**TRG15243GS**	YH3	13.0	52.0	20.0	5.0	4.0	7.0	3	3.3
M5	x	0.8	**TRG15283GS**	YH3	16.0	60.0	25.0	5.5	4.5	7.0	3	4.2
M6	x	1.0	**TRG15313GS**	YH3	19.0	62.0	28.0	6.0	4.5	7.0	3	5.0
M6	x	0.5	**TRG15333GS**	YH3	19.0	62.0	28.0	6.0	4.5	7.0	3	5.5
M8	x	1.25	**TRG15363GS**	YH3	22.0	70.0	35.0	6.2	5.0	8.0	3	6.8
M8	x	1.0	**TRG15373GS**	YH3	22.0	70.0	35.0	6.2	5.0	8.0	3	7.0
M10	x	1.5	**TRG15424GS**	YH4	24.0	75.0	39.0	7.0	5.5	8.0	3	8.5
M10	x	1.25	**TRG15433GS**	YH3	24.0	75.0	39.0	7.0	5.5	8.0	3	8.8
M10	x	1.0	**TRG15443GS**	YH3	24.0	75.0	39.0	7.0	5.5	8.0	3	9.0
M12	x	1.75	**TRG15504GS**	YH4	29.0	82.0	42.0	8.5	6.5	9.0	3	10.3
M12	x	1.5	**TRG15514GS**	YH4	29.0	82.0	42.0	8.5	6.5	9.0	3	10.5
M12	x	1.25	**TRG15524GS**	YH4	29.0	82.0	42.0	8.5	6.5	9.0	3	10.8
M12	x	1.0	**TRG15533GS**	YH3	29.0	82.0	42.0	8.5	6.5	9.0	3	11.0
M14	x	2.0	**TRG15544GS**	YH4	30.0	88.0	46.0	10.5	8.0	11.0	3	12.0
M14	x	1.5	**TRG15554GS**	YH4	30.0	88.0	46.0	10.5	8.0	11.0	3	12.5
M16	x	2.0	**TRG15604GS**	YH4	32.0	95.0	50.0	12.5	10.0	13.0	3	14.0
M16	x	1.5	**TRG15614GS**	YH4	32.0	95.0	50.0	12.5	10.0	13.0	3	14.5
M18	x	2.5	**TRG15655GS**	YH5	37.0	100.0	55.0	14.0	11.0	14.0	3	15.5
M18	x	1.5	**TRG15674GS**	YH4	37.0	100.0	55.0	14.0	11.0	14.0	3	16.5
M20	x	2.5	**TRG15705GS**	YH5	37.0	105.0	56.0	15.0	12.0	15.0	3	17.5
M20	x	1.5	**TRG15724GS**	YH4	37.0	105.0	56.0	15.0	12.0	15.0	3	18.5

◎ : Excellent(优秀) ○ : Good(良好)

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

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

CUTTING SPEED TABLE 切削速度表 - METRIC

Cutting Speeds m/min. into revolutions per minute 切削速度mm

TOOL RPM (rev./min.)

Tool Dia.	Cutting Speed (m/min.)															
	1	2	3	4	5	6	8	10	12	15	20	25	30	40	50	60
1	318	637	955	1274	1592	1910	2548	3185	3822	4777	6366	7962	9554	12739	15924	19108
2	159	318	478	637	796	955	1274	1592	1911	2388	3185	3981	4777	6369	7962	9554
3	106	212	318	425	531	637	849	1062	1274	1592	2123	2654	3185	4246	5308	6369
4	80	159	239	318	398	478	637	796	955	1194	1592	1990	2389	3185	3981	4777
5	64	127	191	255	318	382	510	637	764	955	1274	1592	1911	2548	3185	3822
6	53	106	159	212	265	318	425	531	637	796	1062	1327	1592	2123	2653	3185
8	40	80	119	159	199	239	318	398	478	597	796	955	1194	1592	1990	2388
10	31	64	96	127	159	191	255	318	382	478	637	796	955	1274	1592	1911
12	26	53	80	106	133	159	212	265	318	398	531	663	796	1062	1327	1592
14	23	45	68	91	114	136	182	227	273	341	455	569	682	910	1137	1365
16	20	40	60	80	100	119	159	199	239	299	398	498	597	796	995	1194
18	18	35	53	71	88	106	142	177	212	265	354	442	531	708	885	1062
20	16	32	48	64	80	96	127	159	191	239	318	398	478	637	796	955
25	13	25	38	51	64	76	102	127	153	191	255	318	382	510	637	764
30	11	21	32	42	53	64	85	106	127	159	212	265	318	425	531	637
35	9	18	27	36	45	55	73	91	109	136	182	227	273	364	455	546
40	8	16	24	32	40	48	64	80	96	119	159	199	239	318	398	478

RPM = rev./min.
V = m/min.
D = Dia.(mm)

$$V = \frac{RPM \cdot \pi \cdot D}{1000}$$

$$RPM = \frac{1000 \cdot V}{\pi \cdot D}$$

RECOMMENDED TAP DRILL SIZE (M / MF) 推荐攻丝底孔尺寸

Unit(单位) : mm

Thread Size	Drill Size (mm)	D1 (mm)	
		Max.	Min.
M2 × 0.4	1.6	1.679	1.567
M2 × 0.25	1.75	(1.785)	(1/729)
M2.2 × 0.45	1.75	1.838	1.713
M2.2 × 0.25	1.95	(1.985)	(1.929)
M2.3 × 0.4	1.9	1.979	1.867
M2.3 × 0.25	2.05	2.061	2.001
M2.5 × 0.45	2.1	2.138	2.013
M2.5 × 0.35	2.2	2.221	2.121
M2.6 × 0.45	2.2	2.238	2.113
M2.6 × 0.35	2.2	2.246	2.186
M3 × 0.5	2.5	2.599	2.459
M3 × 0.35	2.7	2.721	2.621
M3.5 × 0.6	2.9	3.01	2.85
M3.5 × 0.35	3.2	3.221	3.121
M4 × 0.7	3.3	3.422	3.242
M4 × 0.5	3.5	3.599	3.459
M4.5 × 0.75	3.8	3.878	3.688
M4.5 × 0.5	4	4.099	3.959
M5 × 0.8	4.2	4.334	4.134
M5 × 0.5	4.5	4.599	4.459
M6 × 1.0	5	5.153	4.917
M6 × 0.75	5.3	5.378	5.188
M6 × 0.5	5.5	5.55	5.4
M7 × 1.0	6	6.153	5.917
M7 × 0.75	6.3	6.378	6.188
M7 × 0.5	6.5	6.55	6.4
M8 × 1.25	6.8	6.912	6.647
M8 × 1.0	7	7.153	6.917
M8 × 0.75	7.3	7.378	7.188
M8 × 0.5	7.5	7.52	7.4
M9 × 1.25	7.8	7.912	7.647
M9 × 1.0	8	8.153	7.917
M9 × 0.75	8.3	8.378	8.188
M10 × 1.5	8.5	8.676	8.376
M10 × 1.25	8.8	8.912	8.647
M10 × 1.0	9	9.153	8.917
M10 × 0.75	9.3	9.378	9.188
M10 × 0.5	9.5	9.52	9.4
M11 × 1.5	9.5	9.676	9.376
M11 × 1.0	10	10.153	9.917
M11 × 0.75	10.3	10.378	10.188
M12 × 1.75	10.3	10.441	10.106
M12 × 1.5	10.5	10.676	10.376
M12 × 1.25	10.8	10.912	10.647
M12 × 1.0	11	11.153	10.917
M12 × 0.5	11.5	11.52	11.4
M14 × 2.0	12	12.21	11.835
M14 × 1.5	12.5	12.676	12.376
M14 × 1.0	13	13.153	12.917
M15 × 1.5	13.5	13.676	13.376
M15 × 1.0	14	14.153	13.917
M16 × 2.0	14	14.21	13.835
M16 × 1.5	14.5	14.676	14.376
M16 × 1.0	15	15.153	14.917
M17 × 1.5	15.5	15.676	15.376
M17 × 1.0	16	16.153	15.917
M18 × 2.5	15.5	15.744	15.294
M18 × 2.0	16	16.21	15.835
M18 × 1.5	16.5	16.676	16.376
M18 × 1.0	17	17.153	16.917
M20 × 2.5	17.5	17.744	17.294
M20 × 2.0	18	18.21	17.835
M20 × 1.5	18.5	18.676	18.376
M20 × 1.0	19	19.153	18.917
M22 × 2.5	19.5	19.744	19.294
M22 × 2.0	20	20.21	19.835
M22 × 1.5	20.5	20.676	20.376
M22 × 1.0	21	21.153	20.917
M24 × 3.0	21	21.252	20.752
M24 × 2.0	22	22.21	21.835
M24 × 1.5	22.5	22.676	22.376
M24 × 1.0	23	23.153	22.917
M25 × 2.0	23	23.21	22.835
M25 × 1.5	23.5	23.676	23.376
M25 × 1.0	24	24.153	23.917
M26 × 1.5	24.5	24.676	24.376
M27 × 3.0	24	24.252	23.752
M27 × 2.0	25	25.21	24.835
M27 × 1.5	25.5	25.676	25.376
M27 × 1.0	26	26.153	25.917
M28 × 2.0	26	26.21	25.835
M28 × 1.5	26.5	26.676	26.376
M28 × 1.0	27	27.153	26.917
M30 × 3.5	26.5	26.771	26.211
M30 × 3.0	27	27.252	26.752
M30 × 2.0	28	28.21	27.835
M30 × 1.5	28.5	28.676	28.376
M30 × 1.0	29	29.153	28.917
M32 × 2.0	30	30.21	29.835
M32 × 1.5	30.5	30.676	30.376
M33 × 3.5	29.5	29.771	29.211
M33 × 3.0	30	30.252	29.752
M33 × 2.0	31	31.21	30.835
M33 × 1.5	31.5	31.676	31.376
M35 × 1.5	33.5	33.676	33.376
M36 × 4.0	32	32.27	31.67
M36 × 3.0	33	33.252	32.752
M36 × 2.0	34	34.21	33.835
M36 × 1.5	34.5	34.676	34.376
M38 × 1.5	36.5	36.676	36.376
M39 × 4.0	35	35.27	34.67
M39 × 3.0	36	36.252	35.752
M39 × 2.0	37	37.21	36.835
M39 × 1.5	37.5	37.676	37.376
M40 × 3.0	37	37.252	36.752
M40 × 2.0	38	38.21	37.835
M40 × 1.5	38.5	38.676	38.376
M42 × 4.5	37.5	37.799	37.129
M42 × 4.0	38	38.27	37.67
M42 × 3.0	39	39.252	38.752
M42 × 2.0	40	40.21	39.835
M42 × 1.5	40.5	40.676	40.376
M45 × 4.5	40.5	40.799	40.129
M45 × 4.0	41	41.27	40.67
M45 × 3.0	42	42.252	41.752
M45 × 2.0	43	43.21	72.835
M45 × 1.5	43.5	43.676	73.376
M48 × 5.0	43	43.297	42.587
M48 × 4.0	44	44.27	43.67
M48 × 3.0	45	45.252	44.752
M48 × 2.0	46	46.21	45.835
M48 × 1.5	46.5	46.676	46.376
M50 × 3.0	47	47.252	46.752
M50 × 2.0	48	48.21	47.835
M50 × 1.5	48.5	48.676	48.376

YG-1 YH LIMIT SYSTEM
YG-1 YH 精度体系

YG-1 applies a unique system of tap pitch diameter limits. We call it the YH limits system.
Using the step method, you can select the best tap pitch diameter limits to match your work condition.
YG-1使用一套独特的丝锥中径精度. 我们叫它YH精度体系. 用等级方法, 你可选择最合适你工件条件的丝锥中径精度.
YH limit Most of YG-1's taps use this limit system. The limits calculated as follows;
YH精度, 为大多数YG-1的丝锥所采用. 精度计算如下.

1. Up to 0.6P (40TPI)

upper limits : 10㎛+15㎛×n
lower limit : (upper limits) - 15㎛

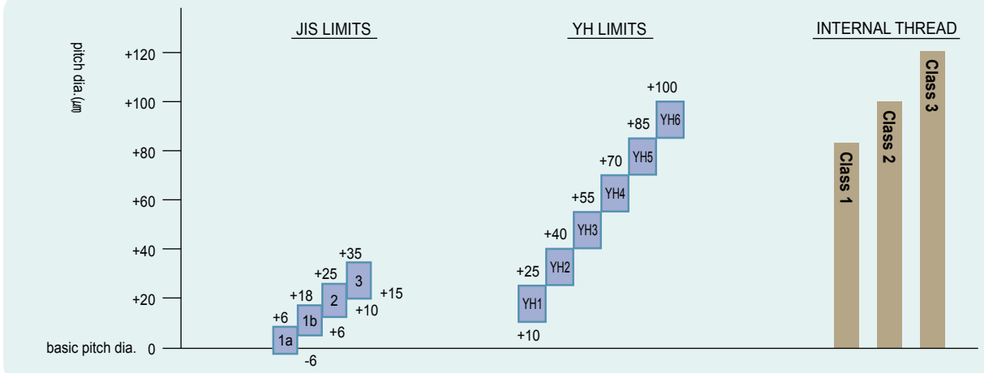
n=YH No.

2. Above 0.7P (36TPI)

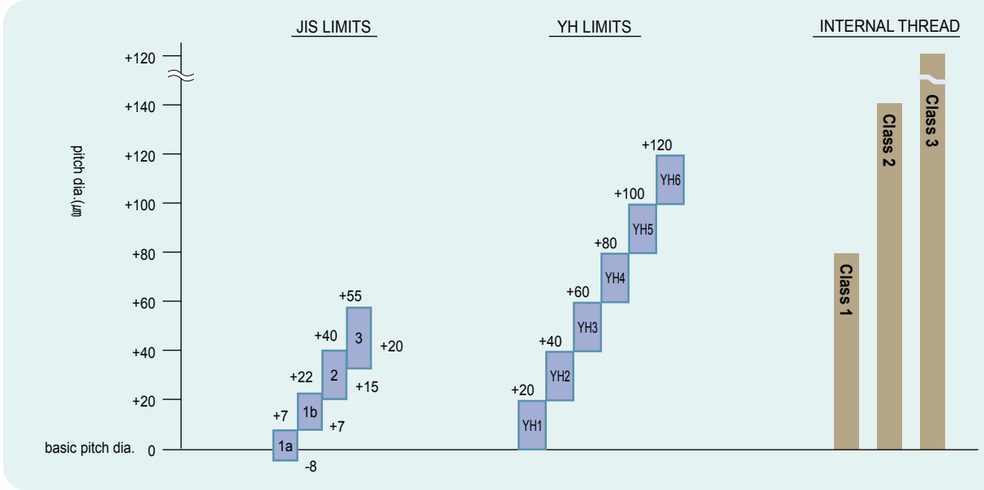
upper limits : 20㎛×n
lower limit : (upper limits) - 20㎛

n=YH No.

Example M3×0.5 / 例如M3×0.5



Example M10×1.5 / 例如M10×1.5



HARDNESS CONVERSION TABLE
硬度换算表

Rockwell ★ C. Scale Hardness	Vickers Hardness	Brinell Hardness	Rockwell A. Scale Hardness	Shore Hardness	Tensile Strength ★★ MPa (Kgf/mm²)
58	653	---	80.1	78	---
57	633	---	79.6	76	---
56	613	---	79.0	75	---
55	595	---	78.5	74	2075 (212)
54	577	---	78.0	72	2015 (205)
53	560	---	77.4	71	1950 (199)
52	544	(500)	76.8	69	1880 (192)
51	528	(487)	76.3	68	1820 (186)
50	513	(475)	75.9	67	1760 (179)
49	498	(464)	75.2	66	1695 (173)
48	484	451	74.7	64	1635 (167)
47	471	442	74.1	63	1580 (161)
46	458	432	73.6	62	1530 (156)
45	446	421	73.1	60	1480 (151)
44	434	409	72.5	58	1435 (146)
43	423	400	72.0	57	1385 (141)
42	412	390	71.5	56	1340 (136)
41	402	381	70.9	55	1295 (132)
40	392	371	70.4	54	1250 (127)
39	382	362	69.9	52	1215 (124)
38	372	353	69.4	51	1180 (120)
37	363	344	68.9	50	1160 (118)
36	354	336	68.4	49	1115 (114)
35	345	327	67.9	48	1080 (110)
34	336	319	67.4	47	1055 (108)
33	327	311	66.8	46	1025 (105)
32	318	301	66.3	44	1000 (102)
31	310	294	65.8	43	980 (100)
30	302	286	65.3	42	950 (97)
29	294	279	64.7	41	930 (95)
28	286	271	64.3	41	910 (93)
27	279	264	63.8	40	880 (90)
26	272	258	63.3	38	860 (88)
25	266	253	62.8	38	840 (86)
24	260	247	62.4	37	825 (84)
23	254	243	62.0	36	805 (82)
22	248	237	61.5	35	785 (80)
21	243	231	61.0	35	770 (79)
20	238	226	60.5	34	760 (77)
(18)	230	219	---	33	730 (75)
(16)	222	212	---	32	705 (72)
(14)	213	203	---	31	675 (69)
(12)	204	194	---	29	650 (66)
(10)	196	187	---	28	620 (63)
(8)	188	179	---	27	600 (61)
(6)	180	171	---	26	580 (59)
(4)	173	165	---	25	550 (56)
(2)	166	158	---	24	530 (54)
(0)	160	152	---	24	515 (53)

- Hardness conversions should only be used as a rough guide due to variation for different materials.
  Figures shown in bold type are based on ASTM E 140 (which being adjusted commonly by SAE-ASM-ASTM).
★ Figure shown in ( ) are provided for reference only.
★★ The unit of tensile strength and figures in ( ) are converted from psi values by using conversion tables in JIS Z 8413 & Z 8438.
  This table is according to SAE J 417 (partial listing).

- 硬度转换只作为粗略的参考, 因为不同材料会有变化.
  黑体字的数字是以ASTM E 140为基准(通常由SAE-ASM-ASTM进行调整)
★ ( )中的数字只供参考
★★ 抗拉强度的单位和( ) 中的数字是用JIS Z 8413 & Z 8438中的转换表由psi值转换的.
  此表是根据SAE J 417作成(部分)

TROUBLE SHOOTING GUIDE
攻丝过程中的问题及对策

Problem / 问题	Cause / 问题发生	Solution / 对策
Tapped hole oversize **攻孔过大**	Incorrect tap in use (cutting geometry unsuitable for application) 不正确的丝锥使用(切削参数不适合运用)	Use tap selected from the relevant material group 根据相应的材料组选择丝锥
	Faulty alignment 同轴性不好	Ensure that the tap is correctly aligned with the core hole axis 确保丝锥和锥孔准确的在一条线上
	Cold welding 冷焊	Improve lubrication and direction of coolant Adjust cutting speed 改变冷却油方向, 调整切削速度
	Re-ground tap(lead-in is not concentric) 重置丝锥(引入线不是同心的)	Regrind tap lead correctly on a suitable tap grinding machine 用合适的研磨机械再研磨丝锥的引入部分
Stripped threads **带状螺纹**	Incorrect tap in use (cutting geometry incorrect for application) 错误使用丝锥(切削参数不适合运用)	Use a tap from the relevant material group. 根据相应的材料组选择丝锥
	Spindle speed and feed rate not synchronized 主轴速度和进给率不同步	Check feed rate programming and / or pitch of leading spindle Use a tapping spindle with axial float 检查进给率程序和主轴螺距 使用带有轴向滑动的攻丝主轴
	Insufficient start pressure exerted on tap with peel-cut 不足的启动压力, 促使外面的螺纹脱落	Increase start pressure 增大启动压力
Bell mouthed tapped hole **攻丝的孔成钟型**	Incorrect start pressure applied to tap 启动压力不合适	Use a tapping spindle with axial float 使用带有轴向滑动的攻丝主轴
Unsatisfactory thread surface finish **不理想的螺纹表面**	Incorrect tap in use (Cutting geometry unsuitable for application) 错误使用丝锥 (切削参数不适合运用)	Select tap from the relevant material group 根据相应的材料组选择丝锥
	The tap is blunt 丝锥生硬	Replace or re-grind tap 替换和重新研磨丝锥
	Tap badly re-ground 再研磨效果差	Re-grind tap again. Check that cutting geometry is suitable for material 再研磨一遍 检查切削参数是否适合被加工材料
	Coolant lacking in lubricating qualities and / or quantity 冷却油太少影响润滑质量和产量	Ensure the use of asuitable coolant and an ample supply 确保冷却油使用正确且供应充足

Problem / 问题	Cause / 问题发生	Solution / 对策
Partial chipping of tap **丝锥的铁屑部分**	Swarf jamming 金属屑阻塞	Check cutting speed Use alternative tap type 检查切削速度 使用有选择性的丝锥类型
	Tap has jammed against bottom of core hole 丝锥碰到孔底部而阻塞	Check hole and thread depths Drill core hole deeper 检查孔和螺纹的深度 钻孔要深一些
	Tap incorrectly re-ground (lead-in diameter too small therefore too few cutting teeth) 丝锥错误的再研磨 (导入的直径太小以至于切齿太少)	Ensure that original values ore maintained when regrinding 在再研磨时, 确保它的原始值
	Irregular workpiece material structure 无规律的工件原材料结构	Adjust cutting speed to suit workpiece material 调整切削速度以合适被加工材料
Excessive tap wear **过度的丝锥破损**	Incorrect cutting speed 不当的切削速度	Use a tap from the relevant material group. 根据相应的材料组选择丝锥
	Coolant lacking in lubricating qualities and / or quantity 冷却油太少影响润滑质量和产量	Ensure the use of a suitable coolant and an ample supply 确保冷却油使用正确且供应充足 Check that coolant is reaching the cutting zone 检查冷却油是否到达加工区域
	Surface of the core hole is compacted 攻孔太小, 孔的外表面压缩	Check core hole drilling conditions (drill carefully to reduce risk of surface compacting) 检查钻孔情况(仔细钻孔以减少缩孔的风险) Check drill cutting edges 检查钻边
Tap breakage **丝锥破损**	Incorrect tap in use (cutting geometry unsuitable for application) 错误使用丝锥(切削参数不适合运用)	Use tap from the relevant material group 根据相应的材料组选择丝锥
	Centering error 中心误差	Ensure that axes of tap and core hole are aligned 确保丝锥和被加工孔成一条直线
	Blunt tap 丝锥生硬	Re-grind tap 再研磨丝锥 Ensure that taps are stored carefully 确保丝锥的存放安全性
	Tap has reached bottom of core hole 丝锥碰到孔的底部	Use tapping spindle with axial float and slipping clutch 用具有轴向滑动制动的攻丝主轴
	Core hole too small 攻孔太小	Select core hole as per chart, pages 11 of this catalogue 为每一步选择攻孔 手册在11页