

# 硬质合金棒材

Cemented Carbide Rods



## 公司简介

### About GESAC

厦门金鹭特种合金有限公司，成立于 1989 年，是一家国家级高新技术企业，是国有上市公司厦门钨业的核心成员。主要从事钨粉、碳化钨粉、硬质合金、切削刀具等钨系列产品的生产和销售；是世界最大的钨粉、碳化钨粉供应商和出口商；是高品质硬质合金及其精密切削工具的制造商。

公司拥有一支自强不息的、高素质员工团队，拥有国际一流的工艺技术、生产设备和检测仪器；其生产的“金鹭”牌系列产品以优良的品质和完善的服务，享誉国内外；客户遍布全球四十多个工业发达国家和地区。

公司建立了国家级技术中心，独立承担并完成了多项“国家科技攻关计划”项目、“国家火炬计划”项目、“国家重点新产品”开发项目及省市重点研究课题，被评为“国家重点高新技术企业”、“先进技术企业”、“出口型企业”。

公司坚持以诚信为本的理念，致力于不断创新、发展成为“设备一流”、“技术一流”、“管理一流”、“质量一流”、“服务一流”的现代化企业。

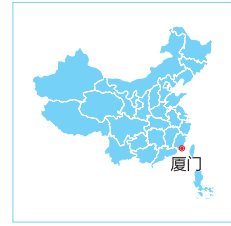
Xiamen Golden Egret Special Alloy Co., Ltd. (GESAC) was founded in 1989, and is one of the core subsidiaries of the listed state-owned corporation XTC group. GESAC specializes in the manufacture and sale of various types of tungsten powder, cemented carbide and carbide cutting tools. Up to now, GESAC has become the largest manufacturer and exporter of tungsten powder and tungsten carbide powder in the world. GESAC is also one of the world's largest manufacturers of premium cemented carbide rods and blanks and high performance cutting tools.

GESAC continuously pursues excellence through creative talents, advanced technologies, high-level manufacturing equipments and quality testing facilities. Driven by high quality products and superior service, our brand "Golden Egret" has become one of the leading brand in the market, enjoying famous reputation in more than 40 countries and regions.

A national level R&D center was established in 2008. GESAC took the complete responsibility for numerous national and provincial R&D projects and was awarded as "National Standard High-Tech Enterprise", "Enterprise with Advanced Technology" and "Export-Oriented Enterprise".

Based on sincerity and loyalty to our customers and partners, we are striving for continuous innovations to be a modernized enterprise with first-level equipments, advanced technologies, progressive administration, superb quality and excellent service.





● 金鹭工厂分布 GESAC Facilities

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## 编码体系

### GESAC Code Key

#### 棒材或板材 Rods or Plates

H2      U20      BR    2    040    050    A

①                      ②                      ③                      ⑤                      ⑦                      ⑧                      ⑪

#### 带内冷孔棒材 Rods with Coolant Holes

H2 U20 GD 30 2 040 075 020 050 A

①                      ②                      ③                      ④                      ⑥                      ⑦                      ⑧                      ⑨                      ⑩                      ⑪

① 产品类别 Product Category
H0-毛坯/ Unground
H1-半精磨/ Semi Fine Ground
H2-精磨h6/ Ground h6
H7-精磨h5/ Ground h5

② 金鹭牌号 GESAC Grade
U25U-GU25UF
U20F-GU20F
U20-GU20
K05A-GK05A
K20-GK20
.....

③ 产品规格种类 Type Classification
BR-圆棒/ Solid Rods
BQ-球头棒/ Ballnose Endmill Blanks
BT-台阶棒/ Combined Drill and Countersink Blanks
BK-带定位孔棒/ Rods with Center Holes
BZ-尖锥棒/ Rods with Tapered End
TS+形状代码-板材/TS + Shape Code-Plates
GA-单直孔棒材/ Rods with Central Coolant Hole
GB-双直孔棒材/ Rods with 2 Straight Coolant Holes
GD-双螺旋棒材/ Rods with 2 Helical Coolant Holes
GE-三螺旋棒材/ Rods with 3 Helical Coolant Holes
GN-“Y”形内冷孔棒材/ Milling Cutter Blanks with Axial Coolant Hole and Lateral Exits
.....

④ 螺旋角度或斜孔的孔数 Helix Angle or the Number of Holes
--

⑥ 形状代码 Shape Code (带内冷孔棒材/ Rods with Coolant Holes)
--

⑤ 形状代码 Shape Code (棒材或板材/ Rods or Plates)
1-不倒角/ No Chamfer
2-带倒角/ Chamfer
3-双倒角/ Double Chamfers
.....

1-不倒角/ No Chamfer
2-带倒角/ Chamfer
3-油槽/ Slot
4-尖锥/ Tapered End
5-油槽尖锥/ Slot and Tapered
.....

⑨ 孔径 Hole Diameter
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⑩ 孔间距 Bolt Circle
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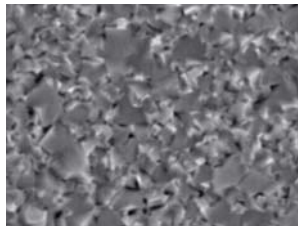
⑦ 直径 Diameter
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⑧ 长度 Length
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⑪ 流水号 Serial Number
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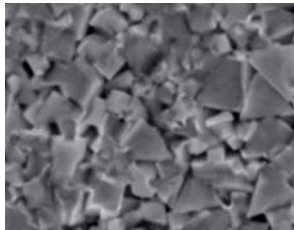
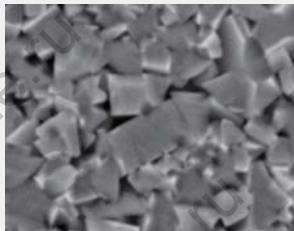
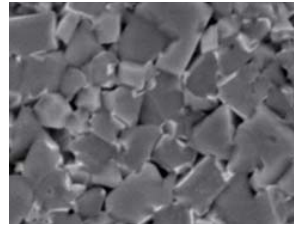
## 牌号介绍

### Grade Introduction

牌号 Grade	ISO牌号 ISO Application Area	晶粒度 Grain Size ( $\mu\text{m}$ )	钴含量 Cobalt Content (%)	硬度 Hardness (HRA)	密度 Density ( $\text{g}/\text{cm}^3$ )	抗弯强度 T.R.S ( $\text{N}/\text{mm}^2$ )	显微组织 Microstructure 10000 $\times$
GU10UF	K05-K10	0.4	6.0	94.0	14.80	3800	
		超细晶粒，具有优良的耐磨性，推荐用于制作具有高耐磨性要求的铣刀、雕刻刀，适用于加工PCB、复合材料 Ultrafine grain size, with amazing wear resistance. High wear resistance endmill and engraving tools are recommended. Suitable for cutting PCB and composite material.					
GU15UF	K10-K20	0.4	8.5	93.5	14.52	3800	
		超细晶粒，具有较好的耐磨性，推荐用于制作具有高耐磨性要求的铣刀、雕刻刀，适用于加工PCB和塑胶 Ultrafine grain size, with good wear resistance. High wear resistance endmill and engraving tools are recommended. Suitable for cutting PCB and plastic.					
GU25UF	K20-K40	0.4	12.0	92.5	14.10	4200	
		超细晶粒，兼容了良好的硬度和韧性，适用于制作立铣刀和铰刀，特别适用于精加工以及加工合金钢（HRC: 45-55）、铝合金、钛合金等 Ultrafine grain size, higher Co content; with excellent hardness and toughness. Endmill and reamer are recommended. Excellent performance for finishing. Especially suitable for cutting steel (HRC: 45-55), Al alloy and Ti alloy.					

## 牌号介绍

### Grade Introduction

牌号 Grade	ISO牌号 ISO Application Area	晶粒度 Grain Size ( $\mu\text{m}$ )	钴含量 Cobalt Content (%)	硬度 Hardness (HRA)	密度 Density ( $\text{g}/\text{cm}^3$ )	抗弯强度 T.R.S ( $\text{N}/\text{mm}^2$ )	显微组织 Microstructure 10000 $\times$
GU20F	K20-K40	0.6	10.3	92.3	14.30	3800	
		用于制作通用加工钻头、立铣刀，特别适用于不锈钢、耐热合金、铸铁等 Drill and endmill are recommended. Especially suitable for cutting stainless steel, heat resistant alloy, cast iron.					
GU20	K20-K40	0.8	10.3	91.7	14.40	3500	
		用于制作钻头、立铣刀，适用于普通合金钢 (HRC<48)、灰口铸铁、不锈钢和耐热合金 Drill and endmill are recommended. Suitable for cutting general steel (HRC<48)、grey cast iron, stainless steel and heat resistant alloy.					
GK05A	K15	1.0	6.0	92.5	14.95	2450	
		用于制作钻头、立铣刀和旋转锉刀，特别适用于加工有色金属和石墨制品 (需涂层) Drill, endmill and burr are recommended. Especially suitable for cutting non-ferrous metal and graphite (coating is needed).					

## 牌号推荐

### Grade Selection Guide

加工材料 Workpiece		刀具种类 Type of Cutting Tools		GU10UF	GU15UF	GU25UF	GU20F	GU20	GK05A
P	钢 Steel	钻头 Drill					○	★	
		立铣刀 Endmill	粗加工 Roughing					★	
			精加工 Finishing			★	★	○	
M	不锈钢 Stainless Steel	钻头 Drill					○	★	
		立铣刀 Endmill	粗加工 Roughing					○	
			精加工 Finishing				★		
K	铸铁 Cast Iron	钻头 Drill					○	★	
		立铣刀 Endmill	粗加工 Roughing					★	
			精加工 Finishing				○	○	★
N	有色金属 Nonferrous Material	钻头 Drill						★	▲
		立铣刀 Endmill	粗加工 Roughing					★	
			精加工 Finishing			★			▲
S	耐热合金 Heat Resistance Material	钻头 Drill					○	★	
		立铣刀 Endmill	粗加工 Roughing		★		○	○	
			精加工 Finishing			★	○	○	
H	高硬材料 Hardened Material	钻头 Drill		★	★		○		
		立铣刀 Endmill	粗加工 Roughing	○	○				
			精加工 Finishing	○	○	○			
Others	复合材料 Composite Material	钻头 Drill		★	★		○		
		立铣刀 Endmill	粗加工 Roughing	★	○				
			精加工 Finishing	○	★	○			

★首选First Choice ○次选Second Choice ▲需涂层with Coating

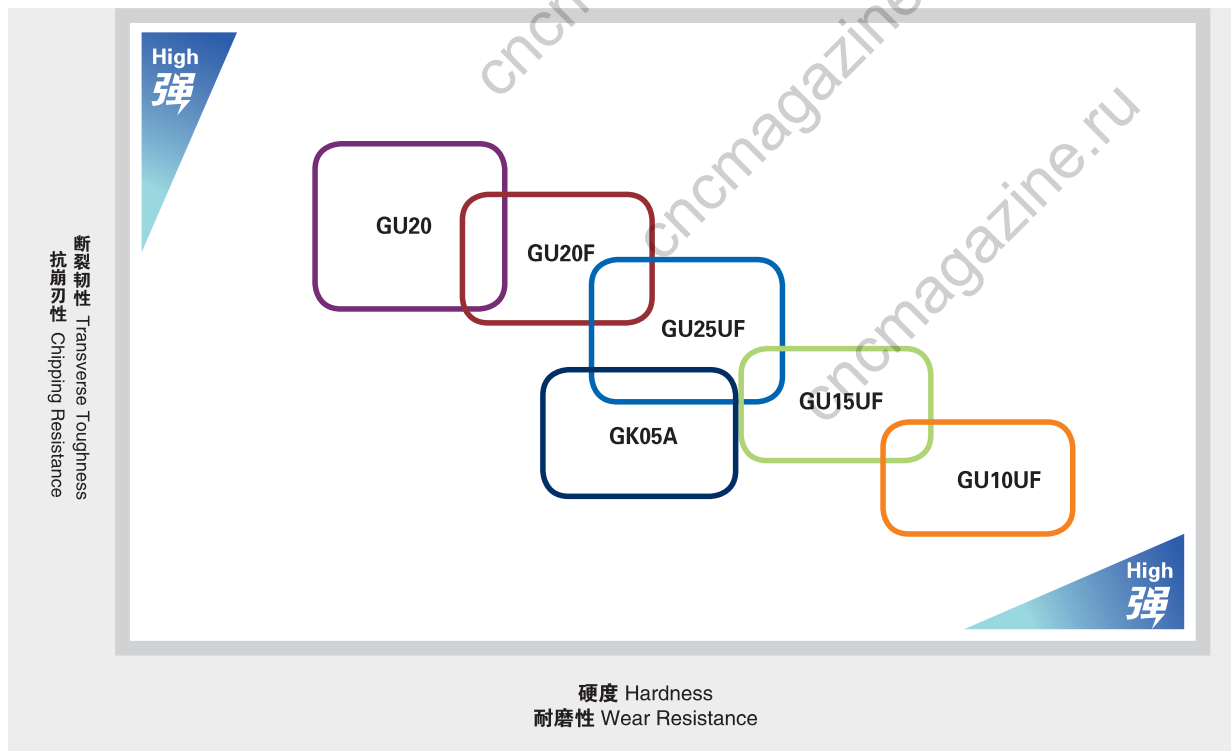
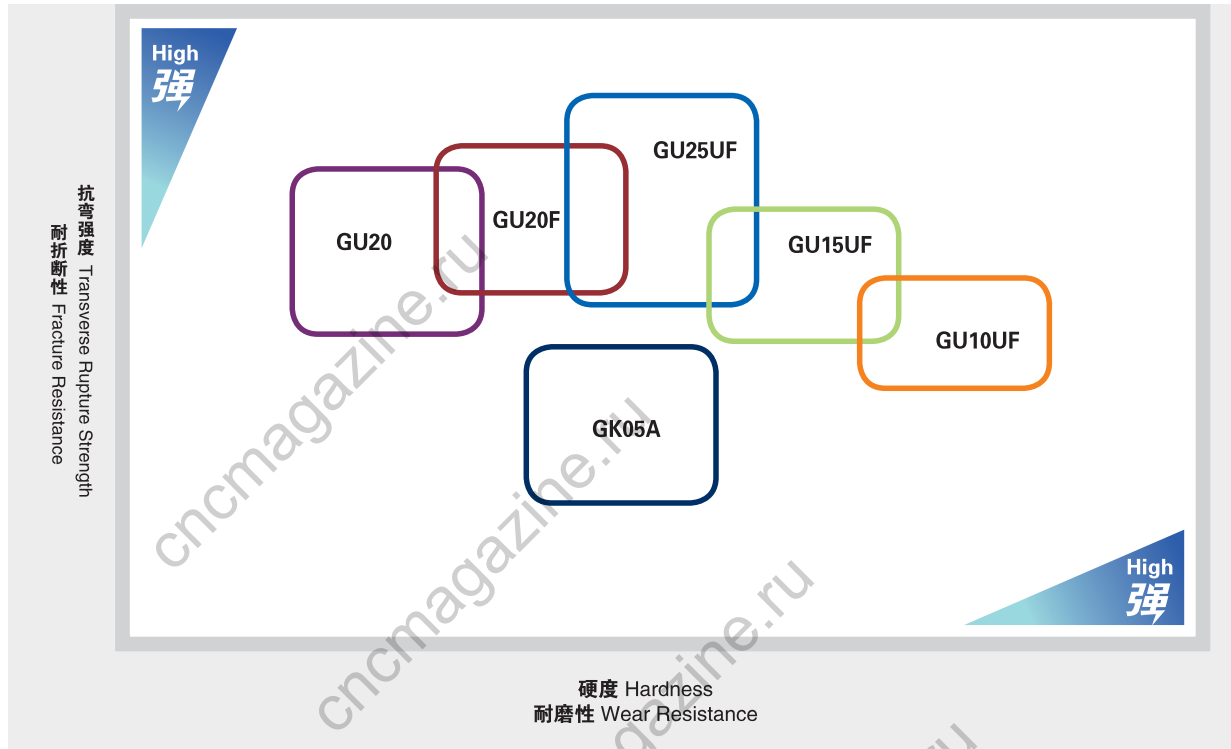
注：由于刀具的刀型和涂层对刀具的使用有较大影响，牌号推荐仅供参考。若需进一步选择调整，请参考牌号特性图

This guide is for reference only. In addition to the grade, cutting tool geometries and coatings also strongly influence cutting tool performance. Please see Grade Characteristics on next page for further information.



## 牌号特性

### Grade Characteristics



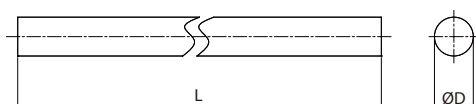


# SOLID RODS

实心圆棒

## 公制长棒

Solid Rods—Metric



毛坯 Unground



精磨 Ground



规格 Type	直径 ØD	长度 L	GU20/ GU25UF	GU20F
BR1020330	2	330	●	○
BR1030310	3	310	●	●
BR1030330	3	330	●	●
BR1040310	4	310	●	●
BR1040330	4	330	●	●
BR1050310	5	310	●	●
BR1050330	5	330	●	●
BR1060310	6	310	●	●
BR1060330	6	330	●	●
BR1070330	7	330	●	○
BR1080310	8	310	●	●
BR1080330	8	330	●	●
BR1090330	9	330	●	○

规格 Type	直径 ØD	长度 L	GU20/ GU25UF	GU20F
BR1100310	10	310	●	●
BR1100330	10	330	●	●
BR1110330	11	330	●	●
BR1120310	12	310	●	●
BR1120330	12	330	●	●
BR1130330	13	330	●	○
BR1140310	14	310	●	●
BR1140330	14	330	●	●
BR1150330	15	330	●	○
BR1160310	16	310	●	●
BR1160330	16	330	●	●
BR1170330	17	330	●	○
BR1180330	18	330	●	●

●=有库存 Stock ○=需订货 Order  
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单位unit (mm)

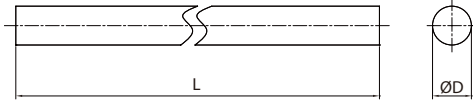
GESAC 标准 GESAC Standard	毛坯 Unground ØD (mm)		精磨 Ground ØD (mm)		长度L (mm)
	范围 (Range)	公差 (Tol.)	范围 (Range)	公差 (Tol.)	公差 (Tol.)
	2 ≤ ØD < 3	+0.15, +0.30	2 ≤ ØD ≤ 42	h5/h6	0, +5
	3 ≤ ØD ≤ 6	+0.30, +0.50			
	6 < ØD ≤ 12	+0.30, +0.60			
	12 < ØD ≤ 16	+0.30, +0.70			
	16 < ØD ≤ 42	+0.30, +0.80			

# 公制长棒

Solid Rods—Metric



实心棒 Solid Rods



毛坯 Unground



精磨 Ground



规格 Type	直径 ØD	长度 L	GU20/ GU25UF	GU20F
BR1190330	19	330	●	○
BR1200310	20	310	●	○
BR1200330	20	330	●	●
BR1210330	21	330	○	○
BR1220330	22	330	○	○
BR1230330	23	330	○	○
BR1240330	24	330	○	○
BR1250330	25	330	●	○
BR1260330	26	330	○	○
BR1270330	27	330	○	○
BR1280330	28	330	○	○
BR1290330	29	330	○	○
BR1300330	30	330	○	○

规格 Type	直径 ØD	长度 L	GU20/ GU25UF	GU20F
BR1310330	31	330	○	○
BR1320330	32	330	○	○
BR1330330	33	330	○	○
BR1340330	34	330	○	○
BR1350330	35	330	○	○
BR1360330	36	330	○	○
BR1370330	37	330	○	○
BR1380330	38	330	○	○
BR1390330	39	330	○	○
BR1400330	40	330	○	○
BR1410330	41	330	○	○
BR1420330	42	330	○	○

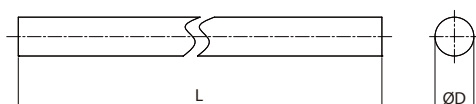
●=有库存 Stock ○=需订货 Order

单位unit (mm)

GESAC 标准 GESAC Standard	毛坯 Unground ØD ( mm )		精磨 Ground ØD ( mm )		长度L ( mm ) 公差 ( Tol. )
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )	
	2 ≤ ØD < 3	+0.15, +0.30	2 ≤ ØD ≤ 42	h5/h6	0, +5
	3 ≤ ØD ≤ 6	+0.30, +0.50			
	6 < ØD ≤ 12	+0.30, +0.60			
	12 < ØD ≤ 16	+0.30, +0.70			
	16 < ØD ≤ 42	+0.30, +0.80			

## 英制长棒

Solid Rods-Inch



毛坯 Unground



精磨 Ground



规格 Type	直径 ØD	长度 L	GU20/ GU25UF	GU20F
BR1031333	0.1250	13-1/8	○	○
BR1035333	0.1406	13-1/8	○	○
BR1039333	0.1563	13-1/8	○	○
BR1043333	0.1719	13-1/8	○	○
BR1047333	0.1875	13-1/8	○	○
BR1051333	0.2031	13-1/8	○	○
BR1055333	0.2188	13-1/8	○	○
BR1059333	0.2344	13-1/8	○	○
BR1063333	0.2500	13-1/8	○	○
BR1071307	0.2813	12-1/8	○	○
BR1075307	0.2969	12-1/8	○	○
BR1079307	0.3125	12-1/8	○	○
BR1083307	0.3281	12-1/8	○	○
BR1087307	0.3438	12-1/8	○	○
BR1091307	0.3594	12-1/8	○	○
BR1095307	0.3750	12-1/8	○	○
BR1099307	0.3906	12-1/8	○	○

规格 Type	直径 ØD	长度 L	GU20/ GU25UF	GU20F
BR1103307	0.4063	12-1/8	○	○
BR1107307	0.4219	12-1/8	○	○
BR1111307	0.4375	12-1/8	○	○
BR1115307	0.4531	12-1/8	○	○
BR1119307	0.4688	12-1/8	○	○
BR1123307	0.4844	12-1/8	○	○
BR1127307	0.5000	12-1/8	○	○
BR1134307	0.5313	12-1/8	○	○
BR1142307	0.5625	12-1/8	○	○
BR1158307	0.6250	12-1/8	○	○
BR1174307	0.6875	12-1/8	○	○
BR1190307	0.7500	12-1/8	○	○
BR1206307	0.8125	12-1/8	○	○
BR1222307	0.8750	12-1/8	○	○
BR1238307	0.9375	12-1/8	○	○
BR1254307	1.0000	12-1/8	○	○

●=有库存 Stock ○=需订货 Order

单位unit (inch)

GESAC 标准 GESAC Standard	毛坯 Unground ØD ( inch )		精磨 Ground ØD ( inch )		长度L ( inch )
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )	公差 ( Tol. )
	1/8 ≤ ØD ≤ 1/4	+0.012, +0.020	1/8 ≤ ØD ≤ 1	h5/h6	+1/8, +3/8
	1/4 < ØD ≤ 31/64	+0.012, +0.024			
	31/64 < ØD ≤ 5/8	+0.012, +0.028			
	5/8 < ØD ≤ 1	+0.012, +0.032			

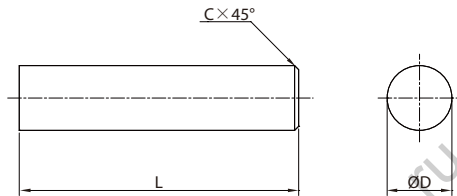
## 精磨倒角短棒

Ground Rods with Chamfer



公制精磨倒角短棒 (h5/h6)

Ground Rods with Chamfer-Metric (h5/h6)



规格 Type	直径 ØD	长度 L (公差Tol./ 0,+1)	倒角尺寸 C (公差Tol./ ±0.1)	倒角角度 Angle of Chamfer (公差Tol./ ±3°)
BR2030040	3	40	0.4	45°
BR2030050	3	50	0.4	45°
BR2030070	3	70	0.4	45°
BR2030100	3	100	0.4	45°
BR2030150	3	150	0.4	45°
BR2040040	4	40	0.4	45°
BR2040050	4	50	0.4	45°
BR2040075	4	75	0.4	45°
BR2040100	4	100	0.4	45°
BR2040150	4	150	0.4	45°
BR2050050	5	50	0.5	45°
BR2050055	5	55	0.5	45°
BR2050060	5	60	0.5	45°
BR2050070	5	70	0.5	45°
BR2050080	5	80	0.5	45°
BR2050100	5	100	0.5	45°
BR2050150	5	150	0.5	45°
BR2060050	6	50	0.5	45°
BR2060060	6	60	0.5	45°
BR2060075	6	75	0.5	45°
BR2060100	6	100	0.5	45°
BR2060150	6	150	0.5	45°
BR2070055	7	55	0.6	45°
BR2070060	7	60	0.6	45°
BR2080060	8	60	0.6	45°
BR2080075	8	75	0.6	45°

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单位unit (mm)

## 精磨倒角短棒

Ground Rods with Chamfer



公制精磨倒角短棒 (h5/h6)

Ground Rods with Chamfer—Metric (h5/h6)



规格 Type	直径 ØD	长度 L (公差Tol./ 0,+1)	倒角尺寸 C (公差Tol./ ±0.1)	倒角角度 Angle of Chamfer (公差Tol./ ±3°)
BR2080080	8	80	0.6	45°
BR2080090	8	90	0.6	45°
BR2080100	8	100	0.6	45°
BR2080150	8	150	0.6	45°
BR2100070	10	70	0.6	45°
BR2100075	10	75	0.6	45°
BR2100090	10	90	0.6	45°
BR2100100	10	100	0.6	45°
BR2100125	10	125	0.6	45°
BR2120110	11	110	0.8	45°
BR2120075	12	75	0.8	45°
BR2120090	12	90	0.8	45°
BR2120100	12	100	0.8	45°
BR2120120	12	120	0.8	45°
BR2140075	14	75	0.8	45°
BR2140110	14	110	0.8	45°
BR2140125	14	125	0.8	45°
BR2160100	16	100	0.8	45°
BR2160125	16	125	0.8	45°
BR2180100	18	100	0.8	45°
BR2180150	18	150	0.8	45°
BR2200100	20	100	1.0	45°
BR2200120	20	120	1.0	45°
BR2200150	20	150	1.0	45°
BR2250100	25	100	1.0	45°
BR2250150	25	150	1.0	45°

单位unit (mm)

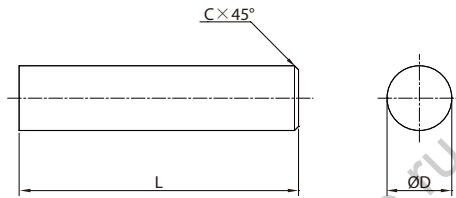
## 精磨倒角短棒

Ground Rods with Chamfer



英制精磨倒角短棒 (h5/h6)

Ground Rods with Chamfer-Inch (h5/h6)



规格 Type	直径 ØD	长度 L (公差 Tol./ 0,+1/16 )	倒角尺寸		倒角角度 Angle of Chamfer (公差 Tol./ ±3° )
			C	公差 Tol.	
BR2031038	0.1250	1-1/2	0.015	±0.004	45°
BR2031050	0.1250	2	0.015	±0.004	45°
BR2031063	0.1250	2-1/2	0.015	±0.004	45°
BR2031076	0.1250	3	0.015	±0.004	45°
BR2047050	0.1875	2	0.015	±0.004	45°
BR2047076	0.1875	3	0.015	±0.004	45°
BR2063050	0.2500	2	0.015	±0.004	45°
BR2063063	0.2500	2-1/2	0.015	±0.004	45°
BR2063076	0.2500	3	0.015	±0.004	45°
BR2063101	0.2500	4	0.015	±0.004	45°
BR2079063	0.3125	2-1/2	0.015	±0.004	45°
BR2095063	0.3750	2-1/2	0.015	±0.004	45°
BR2095076	0.3750	3	0.015	±0.004	45°
BR2127063	0.5000	2-1/2	0.031	±0.008	45°
BR2127076	0.5000	3	0.031	±0.008	45°
BR2127101	0.5000	4	0.031	±0.008	45°
BR2158088	0.6250	3-1/2	0.031	±0.008	45°
BR2190101	0.7500	4	0.031	±0.008	45°
BR2190127	0.7500	5	0.031	±0.008	45°
BR2254101	1.0000	4	0.031	±0.008	45°

单位unit (inch)



## 精磨倒角短棒

Ground Rods with Chamfer



### DIN精磨倒角短棒 (h5/h6)

Ground Rods with Chamfer-DIN (h5/h6)



■ 应用于铣刀 For Mill

规格 Type	直径 ØD	长度 L (公差 Tol./ 0,+1)	倒角尺寸 C (公差 Tol./ ±0.1)	倒角角度 Angle of Chamfer (公差 Tol./ ±3°)	标准 Standard
BR2030038	3	38	0.4	45°	D6527K/D6527L
BR2035050	3.5	50	0.4	45°	D6528
BR2040050	4	50	0.4	45°	D6528
BR2045050	4.5	50	0.5	45°	D6528
BR2050050	5	50	0.5	45°	D6528
BR2055057	5.5	57	0.5	45°	D6528
BR2060050	6	50	0.5	45°	D6527K
BR2060057	6	57	0.5	45°	D6527L/D6528
BR2060054	6	54	0.5	45°	D6527K
BR2065060	6.5	60	0.6	45°	D6528
BR2070060	7	60	0.6	45°	D6528
BR2075063	7.5	63	0.6	45°	D6528
BR2080058	8	58	0.6	45°	D6527K
BR2080063	8	63	0.6	45°	D6527L/D6528
BR2085067	8.5	67	0.6	45°	D6528
BR2090067	9	67	0.6	45°	D6528

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单位unit (mm)

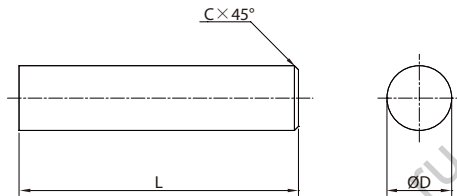
## 精磨倒角短棒

Ground Rods with Chamfer



DIN精磨倒角短棒 (h5/h6)

Ground Rods with Chamfer-DIN (h5/h6)



■ 应用于铣刀 For Mill

规格 Type	直径 ØD	长度 L (公差 Tol./ 0,+1)	倒角尺寸 C (公差 Tol./ ± 0.1)	倒角角度 Angle of Chamfer (公差 Tol./ ± 3°)	标准 Standard
BR2095072	9.5	72	0.6	45°	D6528
BR2100066	10	66	0.6	45°	D6527K
BR2100072	10	72	0.6	45°	D6527L/D6528
BR2110083	11	83	0.8	45°	D6528
BR2120073	12	73	0.8	45°	D6527K
BR2120083	12	83	0.8	45°	D6527L/D6528
BR2130083	13	83	0.8	45°	D6528
BR2140075	14	75	0.8	45°	D6527K
BR2140083	14	83	0.8	45°	D6527L/D6528
BR2150092	15	92	0.8	45°	D6528
BR2160082	16	82	0.8	45°	D6527K
BR2160092	16	92	0.8	45°	D6527L/D6528
BR2180084	18	84	0.8	45°	D6527K
BR2180092	18	92	0.8	45°	D6527L/D6528
BR2200092	20	92	1.0	45°	D6527K
BR2200104	20	104	1.0	45°	D6527L/D6528

单位unit (mm)

## 精磨倒角短棒

Ground Rods with Chamfer



### DIN精磨倒角短棒

Ground Rods with Chamfer-DIN



■ 应用于钻头 For Drill

规格 Type	直径 ØD	长度 L (公差 Tol./ 0,+1)	倒角尺寸 C (公差 Tol./ ±0.1)	倒角角度 Angle of Chamfer (公差 Tol./ ±3°)	标准 Standard
BR2030047	3	47	0.4	45°	D6539
BR2040056	4	56	0.4	45°	D6539
BR2050063	5	63	0.5	45°	D6539
BR2060063	6	63	0.5	45°	D6537K
BR2060067	6	67	0.5	45°	D6537K/D6537L/D6539
BR2060075	6	75	0.5	45°	D6537L
BR2060083	6	83	0.5	45°	D6537L
BR2070075	7	75	0.6	45°	D6539
BR2080080	8	80	0.6	45°	D6537K/D6539
BR2080092	8	92	0.6	45°	D6537L
BR2090085	9	85	0.6	45°	D6539
BR2100090	10	90	0.6	45°	D6537K/D6539
BR2100104	10	104	0.6	45°	D6537L
BR2110096	11	96	0.8	45°	D6539
BR2120103	12	103	0.8	45°	D6537K/D6539
BR2120119	12	119	0.8	45°	D6537L
BR2130103	13	103	0.8	45°	D6539
BR2140108	14	108	0.8	45°	D6537K/D6539
BR2140125	14	125	0.8	45°	D6537L
BR2150112	15	112	0.8	45°	D6539
BR2160116	16	116	0.8	45°	D6537K/D6539
BR2160134	16	134	0.8	45°	D6537L
BR2170120	17	120	0.8	45°	D6539
BR2180124	18	124	0.8	45°	D6537K/D6539
BR2180144	18	144	0.8	45°	D6537L
BR2190128	19	128	1.0	45°	D6539
BR2200132	20	132	1.0	45°	D6537K/D6539
BR2200154	20	154	1.0	45°	D6537L

单位unit (mm)

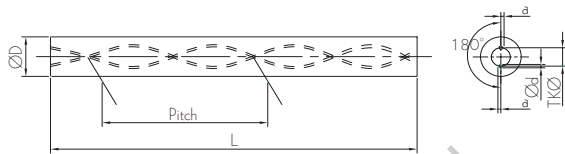


# RODS WITH COOLANT HOLES

带内冷孔棒材

## 30° 双螺旋孔棒材

Rods with 2 Helical Coolant Holes ( 30° )



毛坯 Unground



精磨 Ground



规格 Type	直径 ØD	长度 L (公差 Tol. / 0,+5)	内孔径 Ød	孔间距 TKØ	螺距(±0.5°) Pitch		孔中心 偏离 a	GU20	GU20F	
					P	公差 Tol.				
GD301030330040017A	3	330	0.40	1.70	16.32	-0.32	+0.33	0.15	●	○
GD301040330060022A	4	330	0.60	2.20	21.77	-0.43	+0.45	0.15	●	○
GD301050330070026A	5	330	0.70	2.60	27.21	-0.54	+0.56	0.15	●	○
GD301060330070026A	6	330	0.70	2.60	32.65	-0.65	+0.67	0.15	●	○
GD301070330100037A	7	330	1.00	3.70	38.09	-0.76	+0.78	0.15	●	○
GD301080330100040A	8	330	1.00	4.00	43.53	-0.86	+0.89	0.15	●	○
GD301090330140048A	9	330	1.40	4.80	48.97	-0.97	+1.00	0.20	●	○
GD301100330140048A	10	330	1.40	4.80	54.41	-1.08	+1.11	0.20	●	○
GD301110330140053A	11	330	1.40	5.30	59.86	-1.19	+1.22	0.30	●	○
GD301120330140062A	12	330	1.40	6.25	65.30	-1.30	+1.34	0.30	●	○
GD301130330175065A	13	330	1.75	6.50	70.74	-1.40	+1.45	0.37	●	○

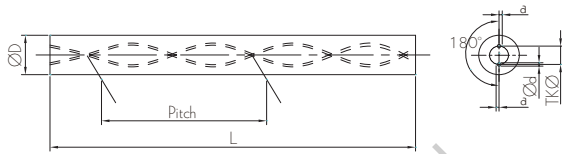
●=有库存 Stock ○=需订货 Order  
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单位 unit (mm)

GESAC 标准 GESAC Standard	毛坯 Unground ØD (mm)		精磨 Ground ØD (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	3 ≤ ØD ≤ 6	+0.60, +1.00	3 ≤ ØD ≤ 25	h6
	6 < ØD ≤ 24	+0.70, +1.10		
	ØD=25	+0.80, +1.20		
GESAC 标准 GESAC Standard	内孔径 Ød (mm)		孔间距 TKØ (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	0.40 ≤ Ød ≤ 0.90	± 0.10	TKØ ≤ 4.00	+0, -0.40
	0.90 < Ød ≤ 1.70	± 0.15	4.00 < TKØ ≤ 5.00	+0, -0.60
	Ød=1.75	± 0.20	5.00 < TKØ ≤ 10.10	+0, -0.80
	Ød=2.00	± 0.25	10.10 < TKØ ≤ 13.30	+0, -1.00

# 30° 双螺旋孔棒材

Rods with 2 Helical Coolant Holes ( 30° )



毛坯 Unground



精磨 Ground



规格 Type	直径 ØD	长度 L (公差 Tol. / 0,+5)	内孔径 Ød	孔间距 TKØ	螺距(±0.5°) Pitch		孔中心 偏离 a	GU20	GU20F	
					P	公差 Tol.				
GD301140330175071A	14	330	1.75	7.10	76.18	-1.51	+1.56	0.40	●	○
GD301150330175077A	15	330	1.75	7.70	81.62	-1.62	+1.67	0.40	●	○
GD301160330175083A	16	330	1.75	8.30	87.06	-1.73	+1.78	0.40	●	○
GD301170330175089A	17	330	1.75	8.90	92.50	-1.84	+1.89	0.45	●	○
GD301180330200095A	18	330	2.00	9.55	97.95	-1.94	+2.00	0.50	●	○
GD301190330200101A	19	330	2.00	10.10	103.39	-2.05	+2.12	0.50	●	○
GD301200330200104A	20	330	2.00	10.40	108.83	-2.16	+2.23	0.50	●	○
GD301210330200111A	21	330	2.00	11.15	114.27	-2.27	+2.34	0.50	○	○
GD301220330200116A	22	330	2.00	11.60	119.71	-2.38	+2.45	0.50	○	○
GD301230330200122A	23	330	2.00	12.20	125.15	-2.48	+2.56	0.50	○	○
GD301240330200128A	24	330	2.00	12.80	130.59	-2.59	+2.67	0.50	○	○
GD301250330200133A	25	330	2.00	13.30	136.03	-2.70	+2.78	0.50	○	○

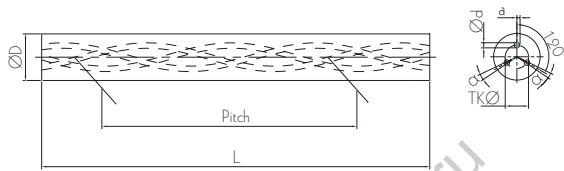
●=有库存 Stock ○=需订货 Order

单位unit (mm)

GESAC 标准 GESAC Standard	毛坯 Unground ØD (mm)		精磨 Ground ØD (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	3 ≤ ØD ≤ 6	+0.60, +1.00	3 ≤ ØD ≤ 25	h6
	6 < ØD ≤ 24	+0.70, +1.10		
	ØD=25	+0.80, +1.20		
GESAC 标准 GESAC Standard	内孔径 Ød (mm)		孔间距 TKØ (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	0.40 ≤ Ød ≤ 0.90	± 0.10	TKØ ≤ 4.00	+0, -0.40
	0.90 < Ød ≤ 1.70	± 0.15	4.00 < TKØ ≤ 5.00	+0, -0.60
	Ød=1.75	± 0.20	5.00 < TKØ ≤ 10.10	+0, -0.80
	Ød=2.00	± 0.25	10.10 < TKØ ≤ 13.30	+0, -1.00

## 30° 三螺旋孔棒材

Rods with 3 Helical Coolant Holes ( 30° )



毛坯 Unground



精磨 Ground



规格 Type	直径 ØD	长度 L (公差 Tol. /0,+5)	内孔径 Ød	孔间距 TKØ	螺距(±0.5°) Pitch			孔中心 偏离		GU20	GU20F
					P	公差 Tol.	a	α			
GE301060330070027A	6	330	0.70	2.75	32.65	-0.65	+0.67	0.15	±4°	○	○
GE301080330100040A	8	330	1.00	4.00	43.53	-0.86	+0.89	0.15	±4°	○	○
GE301100330140050A	10	330	1.40	5.00	54.41	-1.08	+1.11	0.20	±4°	○	○
GE301120330140060A	12	330	1.40	6.00	65.30	-1.30	+1.34	0.30	±4°	○	○
GE301140330175070A	14	330	1.75	7.00	76.18	-1.51	+1.56	0.40	±4°	○	○
GE301160330175080A	16	330	1.75	8.00	87.06	-1.73	+1.78	0.40	±4°	○	○
GE301180330200095A	18	330	2.00	9.55	97.95	-1.94	+2.00	0.50	±4°	○	○
GE301200330200100A	20	330	2.00	10.00	108.83	-2.16	+2.23	0.50	±4°	○	○

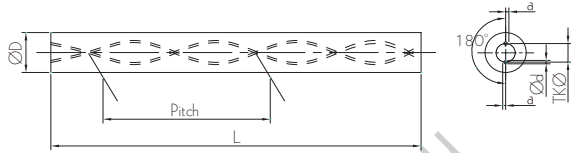
●=有库存 Stock ○=需订货 Order

单位 unit (mm)

GESAC 标准 GESAC Standard	毛坯 Unground ØD (mm)		精磨 Ground ØD (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	ØD=6	+0.60,+1.00	6 ≤ ØD ≤ 20	h6
	6 < ØD ≤ 20	+0.70,+1.10		
GESAC 标准 GESAC Standard	内孔径 Ød (mm)		孔间距 TKØ (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	0.40 ≤ Ød ≤ 0.90	±0.10	TKØ ≤ 4.00	+0, -0.40
	0.90 < Ød ≤ 1.70	±0.15	4.00 < TKØ ≤ 6.00	+0, -0.60
	Ød=1.75	±0.20	6.00 ≤ TKØ ≤ 9.55	+0, -0.80
Ød=2.00	±0.25	TKØ=10.00	+0, -1.00	

# 40° 双螺旋孔棒材

Rods with 2 Helical Coolant Holes ( 40° )



毛坯 Unground



精磨 Ground



规格 Type	直径 ØD	长度 L (公差 Tol. / 0,+5)	内孔径 Ød	孔间距 TKØ	螺距(±0.5°) Pitch		孔中心 偏离 a	GU20	GU20F
					P	公差 Tol.			
GD401060330050022A	6	330	0.50	2.20	22.46	-0.39 +0.40	0.15	●	○
GD401080330065027A	8	330	0.65	2.70	29.95	-0.53 +0.54	0.15	●	○
GD401100330080035A	10	330	0.80	3.50	37.44	-0.66 +0.67	0.20	●	○
GD401120330090042A	12	330	0.90	4.20	44.93	-0.79 +0.80	0.30	●	○
GD401140330100047A	14	330	1.00	4.70	52.42	-0.92 +0.94	0.40	●	○
GD401160330120055A	16	330	1.20	5.50	59.90	-1.05 +1.07	0.40	●	○
GD401180330140063A	18	330	1.40	6.30	67.39	-1.18 +1.21	0.50	●	○
GD401200330150071A	20	330	1.50	7.10	74.88	-1.31 +1.34	0.50	●	○

●=有库存 Stock ○=需订货 Order

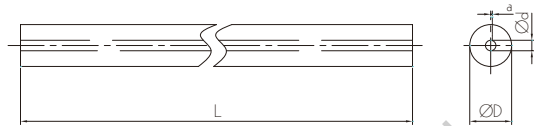
单位 unit (mm)

GESAC 标准 GESAC Standard	毛坯 Unground ØD (mm)		精磨 Ground ØD (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	6 ≤ ØD ≤ 20	+1.10, +1.50	6 ≤ ØD ≤ 20	h6
内孔径 Ød (mm)		孔间距 TKØ (mm)		
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	0.40 ≤ Ød ≤ 0.60	± 0.10	TKØ ≤ 2.20	+0, -0.40
	0.60 < Ød ≤ 0.90	± 0.15	2.20 < TKØ ≤ 2.70	+0, -0.60
	0.90 < Ød ≤ 1.20	± 0.20	2.70 < TKØ ≤ 6.30	+0, -0.80
	1.20 < Ød ≤ 1.50	± 0.25	TKØ = 7.10	+0, -1.00



## 单直孔棒材

Rods with Central Coolant Hole



毛坯 Unground



精磨 Ground

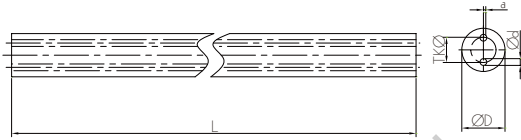


规格 Type	直径 Diameter			长度 L (公差 Tol. / 0,+5)	内孔径 Hole Diameter		孔中心 偏离 a
	ØD	毛坯公差 Tol. of Unground	精品公差 Tol. of Ground		Ød	公差 Tol.	
GA1030330050	3	+0.30,+0.50	h6	330	0.50	± 0.10	0.10
GA1040330080	4	+0.30,+0.50	h6	330	0.80	± 0.10	0.10
GA1050330080	5	+0.30,+0.50	h6	330	0.80	± 0.10	0.13
GA1060330100	6	+0.30,+0.50	h6	330	1.00	± 0.15	0.15
GA1070330100	7	+0.30,+0.60	h6	330	1.00	± 0.15	0.15
GA1080330100	8	+0.30,+0.60	h6	330	1.00	± 0.15	0.15
GA1090330140	9	+0.30,+0.60	h6	330	1.40	± 0.15	0.20
GA1100330140	10	+0.30,+0.60	h6	330	1.40	± 0.15	0.20
GA1110330140	11	+0.30,+0.60	h6	330	1.40	± 0.15	0.28
GA1120330175	12	+0.30,+0.60	h6	330	1.75	± 0.15	0.30
GA1130330175	13	+0.30,+0.70	h6	330	1.75	± 0.15	0.34
GA1140330175	14	+0.30,+0.70	h6	330	1.75	± 0.15	0.37
GA1150330200	15	+0.30,+0.70	h6	330	2.00	± 0.20	0.40
GA1160330200	16	+0.30,+0.70	h6	330	2.00	± 0.20	0.40
GA1170330200	17	+0.30,+0.80	h6	330	2.00	± 0.20	0.47
GA1180330200	18	+0.30,+0.80	h6	330	2.00	± 0.20	0.50
GA1190330200	19	+0.30,+0.80	h6	330	2.00	± 0.20	0.50
GA1200330250	20	+0.30,+0.80	h6	330	2.50	± 0.25	0.50
GA1210330250	21	+0.30,+0.80	h6	330	2.50	± 0.25	0.50
GA1220330250	22	+0.30,+0.80	h6	330	2.50	± 0.25	0.50
GA1230330250	23	+0.30,+0.80	h6	330	2.50	± 0.25	0.50
GA1240330300	24	+0.30,+0.80	h6	330	3.00	± 0.25	0.50
GA1250330300	25	+0.30,+0.80	h6	330	3.00	± 0.25	0.50
GA1260330300	26	+0.30,+0.80	h6	330	3.00	± 0.25	0.50
GA1270330300	27	+0.30,+0.80	h6	330	3.00	± 0.25	0.50
GA1280330300	28	+0.30,+0.80	h6	330	3.00	± 0.25	0.50
GA1290330300	29	+0.30,+0.80	h6	330	3.00	± 0.25	0.50
GA1300330300	30	+0.30,+0.80	h6	330	3.00	± 0.25	0.50

单位unit (mm)

## 双直孔棒材

Rods with Two Straight Coolant Holes



毛坯 Unground



精磨 Ground



■ 标准孔间距系列 Standard Bolt Circle (TK) Series

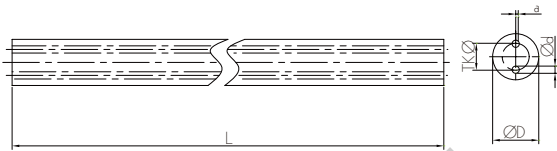
规格 Type	直径 Diameter			长度 L (公差 Tol. (0,+5))	内孔径 Hole Diameter		孔间距 Bolt Circle		孔中心 偏离 a
	$\varnothing D$	毛坯公差 Tol. of Unground	精品公差 Tol. of Ground		$\varnothing d$	公差 Tol.	TK $\varnothing$	公差 Tol.	
GB1040330080018	4	+0.30,+0.50	h6	330	0.80	$\pm 0.10$	1.80	+0,-0.15	0.10
GB1050330080020	5	+0.30,+0.50	h6	330	0.80	$\pm 0.10$	2.00	+0,-0.15	0.13
GB1060330100030	6	+0.30,+0.50	h6	330	1.00	$\pm 0.15$	3.00	+0,-0.20	0.15
GB1070330100035	7	+0.30,+0.60	h6	330	1.00	$\pm 0.15$	3.50	+0,-0.20	0.15
GB1080330100040	8	+0.30,+0.60	h6	330	1.00	$\pm 0.15$	4.00	+0,-0.30	0.15
GB1090330140040	9	+0.30,+0.60	h6	330	1.40	$\pm 0.15$	4.00	+0,-0.30	0.20
GB1100330140050	10	+0.30,+0.60	h6	330	1.40	$\pm 0.15$	5.00	+0,-0.30	0.20
GB1110330140050	11	+0.30,+0.60	h6	330	1.40	$\pm 0.15$	5.00	+0,-0.30	0.28
GB1120330175060	12	+0.30,+0.60	h6	330	1.75	$\pm 0.15$	6.00	+0,-0.30	0.30
GB1130330175060	13	+0.30,+0.70	h6	330	1.75	$\pm 0.15$	6.00	+0,-0.30	0.34
GB1140330175070	14	+0.30,+0.70	h6	330	1.75	$\pm 0.15$	7.00	+0,-0.30	0.37
GB1150330200070	15	+0.30,+0.70	h6	330	2.00	$\pm 0.20$	7.00	+0,-0.30	0.40
GB1160330200080	16	+0.30,+0.70	h6	330	2.00	$\pm 0.20$	8.00	+0,-0.30	0.40
GB1170330200080	17	+0.30,+0.80	h6	330	2.00	$\pm 0.20$	8.00	+0,-0.30	0.47
GB1180330200090	18	+0.30,+0.80	h6	330	2.00	$\pm 0.20$	9.00	+0,-0.30	0.50
GB1190330200090	19	+0.30,+0.80	h6	330	2.00	$\pm 0.20$	9.00	+0,-0.30	0.50
GB1200330250100	20	+0.30,+0.80	h6	330	2.50	$\pm 0.25$	10.00	+0,-0.40	0.50
GB1210330250100	21	+0.30,+0.80	h6	330	2.50	$\pm 0.25$	10.00	+0,-0.40	0.50
GB1220330250110	22	+0.30,+0.80	h6	330	2.50	$\pm 0.25$	11.00	+0,-0.40	0.50
GB1230330250110	23	+0.30,+0.80	h6	330	2.50	$\pm 0.25$	11.00	+0,-0.40	0.50
GB1240330300120	24	+0.30,+0.80	h6	330	3.00	$\pm 0.25$	12.00	+0,-0.50	0.50
GB1250330300120	25	+0.30,+0.80	h6	330	3.00	$\pm 0.25$	12.00	+0,-0.50	0.50
GB1260330300130	26	+0.30,+0.80	h6	330	3.00	$\pm 0.25$	13.00	+0,-0.50	0.50

•  $3 \leq \varnothing D \leq 30$  mm 可订制 Additional dimension on request (  $3 \leq \varnothing D \leq 30$ mm )

单位 unit (mm)

## 双直孔棒材

Rods with Two Straight Coolant Holes



毛坯 Unground



精磨 Ground



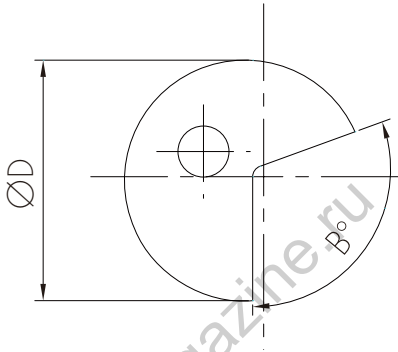
■ 窄孔间距系列 Narrow Bolt Circle (TK) Series

规格 Type	直径 Diameter			长度 L (公差 Tol. /0,+5)	内孔径 Hole Diameter		孔间距 Bolt Circle		孔中心 偏离 a
	ØD	毛坯公差 Tol. of Unground	精品公差 Tol. of Ground		Ød	公差 Tol.	TKØ	公差 Tol.	
GB1060330080015	6	+0.30,+0.50	h6	330	0.80	±0.10	1.50	+0,-0.20	0.15
GB1070330080015	7	+0.30,+0.60	h6	330	0.80	±0.10	1.50	+0,-0.20	0.15
GB1080330100015	8	+0.30,+0.60	h6	330	1.00	±0.15	1.50	+0,-0.30	0.15
GB1090330100026	9	+0.30,+0.60	h6	330	1.00	±0.15	2.60	+0,-0.30	0.20
GB1100330100026	10	+0.30,+0.60	h6	330	1.00	±0.15	2.60	+0,-0.30	0.20
GB1110330120036	11	+0.30,+0.60	h6	330	1.20	±0.15	3.60	+0,-0.30	0.28
GB1120330120036	12	+0.30,+0.60	h6	330	1.20	±0.15	3.60	+0,-0.30	0.30
GB1130330120036	13	+0.30,+0.70	h6	330	1.20	±0.15	3.60	+0,-0.30	0.34
GB1140330150050	14	+0.30,+0.70	h6	330	1.50	±0.15	5.00	+0,-0.30	0.37
GB1150330150050	15	+0.30,+0.70	h6	330	1.50	±0.15	5.00	+0,-0.30	0.40
GB1160330150050	16	+0.30,+0.70	h6	330	1.50	±0.15	5.00	+0,-0.30	0.40
GB1170330200062	17	+0.30,+0.80	h6	330	2.00	±0.20	6.20	+0,-0.30	0.47
GB1180330200062	18	+0.30,+0.80	h6	330	2.00	±0.20	6.20	+0,-0.30	0.50
GB1190330200062	19	+0.30,+0.80	h6	330	2.00	±0.20	6.20	+0,-0.30	0.50
GB1200330200062	20	+0.30,+0.80	h6	330	2.00	±0.20	6.20	+0,-0.40	0.50
GB1210330200062	21	+0.30,+0.80	h6	330	2.00	±0.20	6.20	+0,-0.40	0.50
GB1220330200062	22	+0.30,+0.80	h6	330	2.00	±0.20	6.20	+0,-0.40	0.50
GB1230330200075	23	+0.30,+0.80	h6	330	2.00	±0.20	7.50	+0,-0.40	0.50
GB1240330200075	24	+0.30,+0.80	h6	330	2.00	±0.20	7.50	+0,-0.50	0.50
GB1250330200075	25	+0.30,+0.80	h6	330	2.00	±0.20	7.50	+0,-0.50	0.50
GB1260330200075	26	+0.30,+0.80	h6	330	2.00	±0.20	7.50	+0,-0.50	0.50

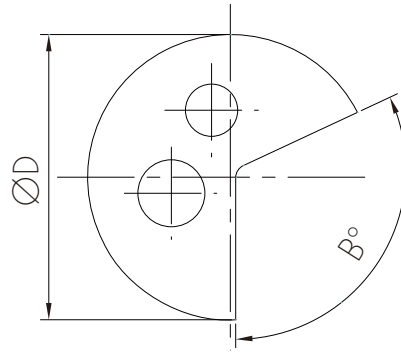
• 3≤ØD≤30 mm 可订制 Additional dimension on request ( 3≤ØD≤30mm )

单位unit (mm)

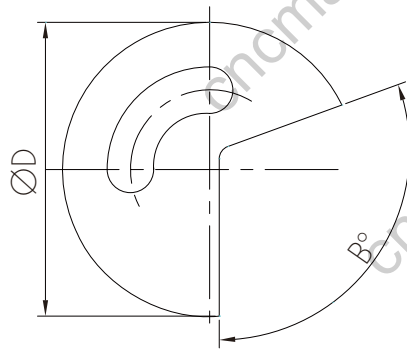
## 毛坯枪钻 (深孔钻) Gun Drill Blanks



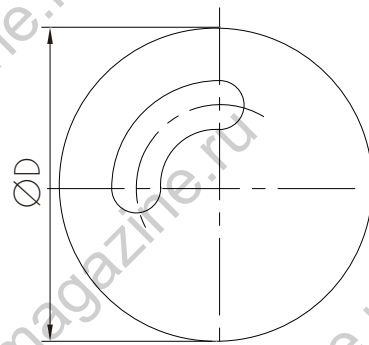
带槽单孔型  
Gun Drill Blank-I



带槽双孔型  
Gun Drill Blank-II



带槽肾形  
Gun Drill Blank-III



无槽肾形  
Gun Drill Blank-IV

- 适用范围 Application area: 深孔钻 Gun drill
- 产品规格 Production type: 直径 Diameter  $\varnothing 6\text{--}\varnothing 25$  mm、长度 Length 30–330 mm
- 尺寸公差 Tolerance: 具体尺寸根据图纸定制 To Customer Specification



# PREFORMS

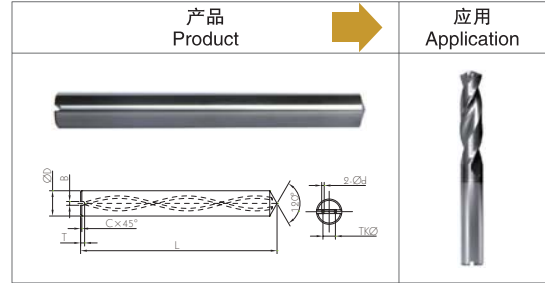
异型棒

# 精磨油槽尖锥螺旋孔棒材

Ground Drill Blanks with Point, Slot and Helical Coolant Holes ( 30° )



- 适用范围 Application: 内冷麻花钻 Drill with Helical Coolant Holes
- 产品优点 Advantages: 减少油槽磨削及成型磨尖工序, 提高加工效率, 降低生产成本。Reduce time for point and slot grinding, improve processing efficiency, reduce production costs.



规格 Type	直径 ØD	长度 L	槽宽 B (公差 Tol. / ± 0.20)	槽深 T (公差 Tol. / 0,+0.40)	倒角尺寸 C (公差 Tol. / ± 0.10)	内孔径 Ød	孔间距 TK Ø	螺距( ± 0.5° ) Pitch		系列 Series
								P	公差 Tol.	
GD305060067070026A	6	67.0	1.50	0.90	0.50	0.70	2.60	32.65	-0.65,+0.67	3 × D
GD305080080100040A	8	80.5	2.00	1.40	0.60	1.00	4.00	43.53	-0.86,+0.89	
GD305100090140048A	10	90.5	2.50	1.65	0.60	1.40	4.80	54.41	-1.08,+1.12	
GD305120104140062A	12	104.0	2.50	1.75	0.80	1.40	6.25	65.30	-1.30,+1.33	
GD305140109175071A	14	109.0	3.00	2.15	0.80	1.75	7.10	76.18	-1.51,+1.56	
GD305160117175083A	16	117.5	3.00	2.30	0.80	1.75	8.30	87.06	-1.73,+1.78	
GD305180125200095A	18	125.5	3.50	2.50	0.80	2.00	9.55	97.95	-1.95,+2.00	
GD305200134200104A	20	134.0	3.50	2.70	1.00	2.00	10.40	108.83	-2.16,+2.22	
GD305060083070026A	6	83.0	1.50	0.90	0.50	0.70	2.60	32.65	-0.65,+0.67	5 × D
GD305080092100040A	8	92.5	2.00	1.40	0.60	1.00	4.00	43.53	-0.86,+0.89	
GD305100104140048A	10	104.5	2.50	1.65	0.60	1.40	4.80	54.41	-1.08,+1.12	
GD305120120140062A	12	120.0	2.50	1.75	0.80	1.40	6.25	65.30	-1.30,+1.33	
GD305140126175071A	14	126.0	3.00	2.15	0.80	1.75	7.10	76.18	-1.51,+1.56	
GD305160135175083A	16	135.5	3.00	2.30	0.80	1.75	8.30	87.06	-1.73,+1.78	
GD305180145200095A	18	145.5	3.50	2.50	0.80	2.00	9.55	97.95	-1.95,+2.00	
GD305200156200104A	20	156.0	3.50	2.70	1.00	2.00	10.40	108.83	-2.16,+2.22	

• 其它尺寸根据图纸定制 Customized

单位unit (mm)

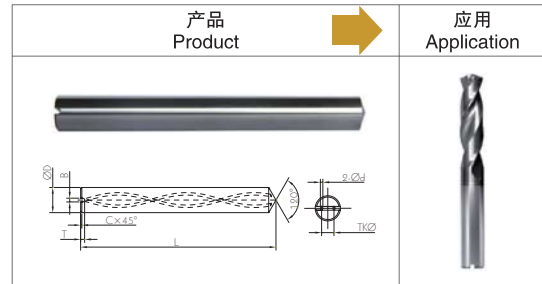
GESAC 标准 GESAC Standard	精磨 Ground ØD (mm)		长度 L (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	6 ≤ ØD ≤ 20	h6	L < 120	0,+1.50
			120 ≤ L	0,+2.00
	内孔径 Ød (mm)		孔间距 TKØ (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	Ød ≤ 0.70	± 0.10	TKØ ≤ 4.00	+0,-0.40
	0.70 < Ød ≤ 1.40	± 0.15	TKØ = 4.80	+0,-0.60
	Ød = 1.75	± 0.20	4.80 < TKØ ≤ 9.55	+0,-0.80
	Ød = 2.00	± 0.25	TKØ = 10.40	+0,-1.00

## 精磨油槽尖锥螺旋孔棒材

Ground Drill Blanks with Point, Slot and Helical Coolant Holes ( 30° )



- 适用范围 Application: 内冷麻花钻 Drill with Helical Coolant Holes
- 产品优点 Advantages: 减少油槽磨削及成型磨尖工序, 提高加工效率, 降低生产成本。Reduce time for point and slot grinding, improve processing efficiency, reduce production costs.



规格 Type	直径 ØD	长度 L	槽宽 B (公差 Tol. / ± 0.20)	槽深 T (公差 Tol. / 0,+0.40)	倒角尺寸 C (公差 Tol. / ± 0.10)	内孔径 Ød	孔间距 TK Ø	螺距 (± 0.5°) Pitch		系列 Series
								P	公差 Tol.	
GD305060098070026A	6	98.0	1.50	0.90	0.50	0.70	2.60	32.65	-0.65,+0.67	7 × D
GD305080107100040A	8	107.5	2.00	1.40	0.60	1.00	4.00	43.53	-0.86,+0.89	
GD305100132140048A	10	132.5	2.50	1.65	0.60	1.40	4.80	54.41	-1.08,+1.12	
GD305120157140062A	12	157.0	2.50	1.75	0.80	1.40	6.25	65.30	-1.30,+1.33	
GD305140184175071A	14	184.0	3.00	2.15	0.80	1.75	7.10	76.18	-1.51,+1.56	
GD305160206175083A	16	206.5	3.00	2.30	0.80	1.75	8.30	87.06	-1.73,+1.78	
GD305180225200095A	18	225.5	3.50	2.50	0.80	2.00	9.55	97.95	-1.95,+2.00	
GD305200247200104A	20	247.0	3.50	2.70	1.00	2.00	10.40	108.83	-2.16,+2.22	

• 其它尺寸根据图纸定制 Customized

单位unit (mm)

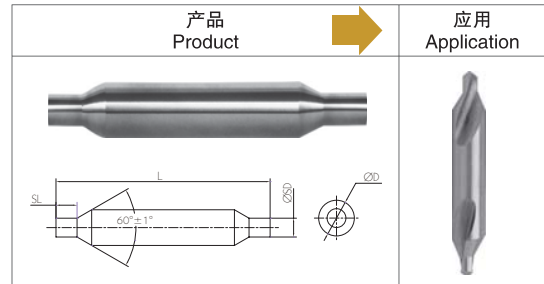
GESAC 标准 GESAC Standard	精磨 Ground ØD (mm)		长度 L (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	6 ≤ ØD ≤ 20	h6	L < 120	0,+1.50
			120 ≤ L	0,+2.00
	内孔径 Ød (mm)		孔间距 TKØ (mm)	
	范围 ( Range )	公差 ( Tol. )	范围 ( Range )	公差 ( Tol. )
	Ød ≤ 0.70	± 0.10	TKØ ≤ 4.00	+0,-0.40
	0.70 < Ød ≤ 1.40	± 0.15	TKØ = 4.80	+0,-0.60
	Ød = 1.75	± 0.20	4.80 ≤ TKØ ≤ 9.55	+0,-0.80
	Ød = 2.00	± 0.25	TKØ = 10.40	+0,-1.00

## 精磨台阶棒

Combined Drill and Countersink Blanks



- 适用范围 Application: 中心钻 Center Drill
- 产品优点 Advantages: 减少刀型对台阶部分磨削时间, 提高生产效率  
Reduce grinding time, improve production efficiency.



规格 Type	直径 ØD (公差 Tol./ h6)	长度 Length		台阶直径 Step Diameter		台阶长度 Step Length	
		L	公差 Tol.	ØSD	公差 Tol.	SL	公差 Tol.
BT0404704701	4.763	47.75	0,+0.79	3.12	± 0.13	2.54	0,+0.41
BT0406305001	6.350	50.80	0,+0.79	3.91	± 0.13	3.56	0,+0.41
BT0407905301	7.938	53.85	0,+0.79	4.32	± 0.13	4.06	0,+0.41
BT0411106901	11.113	69.85	0,+0.79	5.89	± 0.13	6.10	0,+0.41
BT0412707601	12.700	76.20	0,+0.79	6.68	± 0.13	7.24	0,+0.41

• 4.5 ≤ ØD ≤ 25 mm 可订制 Additional dimension on request ( 4.5 ≤ ØD ≤ 25 mm )  
其它尺寸根据图纸定制 Customized

单位 unit (mm)

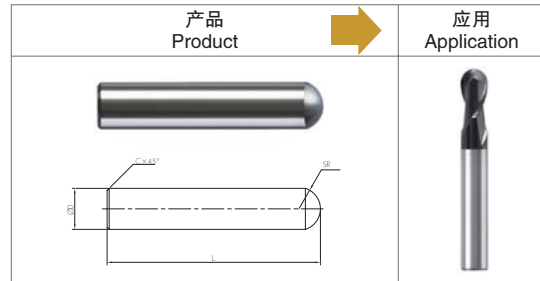


## 精磨球头棒

Ground Ballnose Endmill Blanks



- 适用范围 Application Area: 球头立铣刀 Ballnose Endmill
- 产品优点 Advantages: 减少刀型对球头部分研磨时间提高生产效率; 减少研磨时间提高合金砂轮使用寿命、降低生产成本 Reduce grinding time, improve production efficiency and reduce production costs.



规格 Type	尺寸(公制) Dimension (Metric)					
	直径 Diameter		长度 Length		球头半径 Probe-radius	
	ØD	公差 Tol.	L	公差 Tol.	SR	公差 Tol.
BQ3060058	6	h6	58	0,+1	3.15	0,+0.38
BQ3060080	6	h6	80	0,+1	3.15	0,+0.38
BQ3060064	8	h6	64	0,+1	4.19	0,+0.38
BQ3080100	8	h6	100	0,+1	4.19	0,+0.38
BQ3100073	10	h6	73	0,+1	5.24	0,+0.38
BQ3100100	10	h6	100	0,+1	5.24	0,+0.38
BQ3120084	12	h6	84	0,+1	6.29	0,+0.38
BQ3120120	12	h6	120	0,+1	6.29	0,+0.38
BQ3140084	14	h6	84	0,+1	7.34	0,+0.38
BQ3140120	14	h6	120	0,+1	7.34	0,+0.38
BQ3160093	16	h6	93	0,+1	8.39	0,+0.38
BQ3160140	16	h6	140	0,+1	8.39	0,+0.38
BQ3180093	18	h6	93	0,+1	9.44	0,+0.38
BQ3180160	18	h6	160	0,+1	9.44	0,+0.38
BQ3200105	20	h6	105	0,+1	10.49	0,+0.38
BQ3200160	20	h6	160	0,+1	10.49	0,+0.38

• 其它尺寸根据图纸定制 Customized

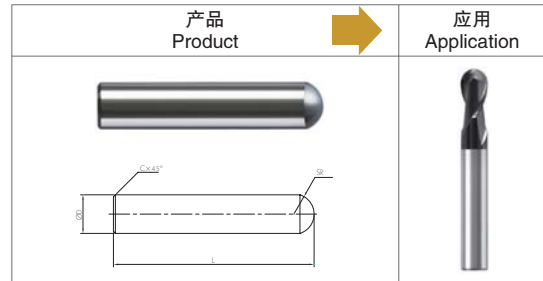
单位unit (mm)

## 精磨球头棒

Ground Ballnose Endmill Blanks

GU20

- 适用范围 Application Area: 球头立铣刀 Ballnose Endmill
- 产品优点 Advantages: 减少刀型对球头部分研磨时间提高生产效率; 减少研磨时间提高合金砂轮使用寿命、降低生产成本 Reduce grinding time, improve production efficiency and reduce production costs.



规格 Type	尺寸(英制) Dimension (Inch)					
	直径 Diameter		长度 Length		球头半径 Probe-radius	
	ØD	公差 Tol.	L	公差 Tol.	SR	公差 Tol.
BQ3063050	0.2500	h6	2.0	0,+1/16	0.13	0,+0.015
BQ3063063	0.2500	h6	2.5	0,+1/16	0.13	0,+0.015
BQ3079050	0.3125	h6	2.0	0,+1/16	0.16	0,+0.015
BQ3079063	0.3125	h6	2.5	0,+1/16	0.16	0,+0.015
BQ3095063	0.3750	h6	2.5	0,+1/16	0.20	0,+0.015
BQ3095076	0.3750	h6	3.0	0,+1/16	0.20	0,+0.015
BQ3095101	0.3750	h6	4.0	0,+1/16	0.20	0,+0.015
BQ3111069	0.4375	h6	2.8	0,+1/16	0.23	0,+0.015
BQ3127076	0.5000	h6	3.0	0,+1/16	0.26	0,+0.015
BQ3127101	0.5000	h6	4.0	0,+1/16	0.26	0,+0.015
BQ3158088	0.6250	h6	3.5	0,+1/16	0.33	0,+0.015
BQ3190101	0.7500	h6	4.0	0,+1/16	0.39	0,+0.015
BQ3254101	1.0000	h6	4.0	0,+1/16	0.52	0,+0.015

• 其它尺寸根据图纸定制 Customized

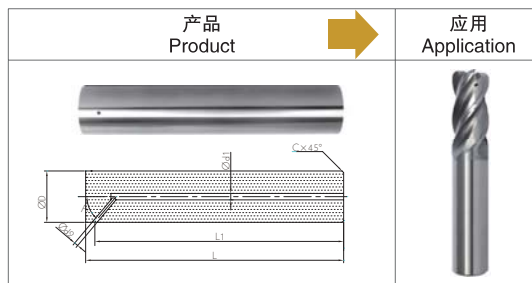
单位unit (inch)

## 精磨Y形孔棒材

Ground Milling Cutter Blanks with Axial Coolant Hole and Lateral Exits



- 适用范围 Application: 前端带多个内冷孔刀具 Milling cutter with center coolant duct and lateral exits
- 产品优点 Advantages: 刀具提供冷却口, 有更好排屑和冷却效果, 更高的刀具使用寿命 The tool provides cooling, better removal and cooling effect of row, Improved chip evacuation and increased tool life.



规格 Type	直径 ØD	长度 L	内孔径 Ød1	其它尺寸 L1	斜孔径 Ød2	倒角尺寸 C
GN3206005817501	6	58.0	1.75	55.0	1.00	0.50
GN3206006517501	6	65.0	1.75	62.0	1.00	0.50
GN3208006417501	8	64.2	1.75	60.0	1.20	1.00
GN3208007917501	8	79.0	1.75	74.8	1.20	1.00
GN3210007320001	10	73.2	2.00	68.0	1.20	1.00
GN3210010120001	10	101.2	2.00	96.0	1.20	1.00
GN3212008420001	12	84.2	2.00	78.0	1.50	1.00
GN3212010120001	12	101.1	2.00	95.0	1.50	1.00
GN3216009340001	16	93.2	4.00	85.0	1.50	1.50
GN3216012840001	16	128.0	4.00	119.8	1.50	1.50
GN3216013340001	16	133.2	4.00	125.0	1.50	1.50
GN3220011040001	20	110.0	4.00	99.8	2.00	1.50
GN3220015140001	20	151.5	4.00	141.0	2.00	1.50
GN3220016141501	20	161.2	4.00	151.0	2.00	1.50
GN3225013040001	25	130.0	4.00	117.5	2.00	1.50
GN3225018540001	25	185.0	4.00	172.5	2.00	1.50
GN3225018641501	25	186.0	4.00	173.5	2.00	1.50

•  $6 \leq \text{ØD} \leq 32$  mm 可订制 Additional dimension on request (  $6 \leq \text{ØD} \leq 32$  mm )  
其它尺寸根据图纸定制 Customized

单位unit (mm)

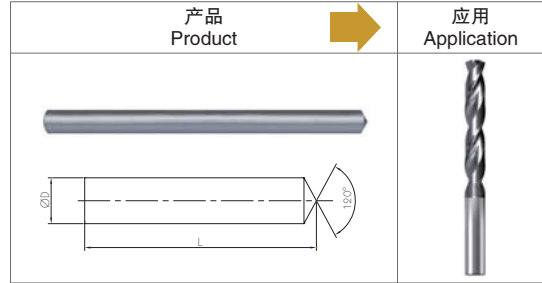
GESAC 标准 GESAC Standard	毛坯 Unground 范围 ( Range )	尺寸公差 Dimension ( Tol. ) (mm)		
		直径 ØD	长度 L	内孔径 Ød1
		h6	0,+1.0	0,+0.30
6 ≤ ØD ≤ 32	长度 L1	斜孔径 Ød2	倒角尺寸 C	
	-0.30,+0.30	-0.15,+0.15	-0.10,+0.10	

# 毛坯尖锥棒

Rods with Tapered End



- 适用范围 Application: 直柄短麻花钻(DIN1897) For Twist Drill with Parallel Shank(DIN1897)
- 产品优点 Advantages: 减少成型磨尖工序, 提高加工效率, 降低生产成本  
Reduce time for point grinding, improve processing efficiency, reduce production costs.



规格 Type	尺寸 Dimension ( DIN1897 )			
	直径 Diameter		长度 Length	
	ØD	公差 Tol.	L	公差 Tol.
BZ1050063	5	+0.30,+0.50	63	0,+1
BZ1060067	6	+0.30,+0.50	67	0,+1
BZ1070075	7	+0.30,+0.60	75	0,+1
BZ1080080	8	+0.30,+0.60	80	0,+1
BZ1090085	9	+0.30,+0.60	85	0,+1
BZ1100090	10	+0.30,+0.60	90	0,+1
BZ1110096	11	+0.30,+0.60	96	0,+1
BZ1120103	12	+0.30,+0.60	103	0,+1
BZ1130103	13	+0.30,+0.70	103	0,+1
BZ1140108	14	+0.30,+0.70	108	0,+1
BZ1150112	15	+0.30,+0.70	112	0,+1
BZ1160116	16	+0.30,+0.70	116	0,+1
BZ1170120	17	+0.30,+0.80	120	0,+1
BZ1180124	18	+0.30,+0.80	124	0,+1
BZ1190128	19	+0.30,+0.80	128	0,+1
BZ1200132	20	+0.30,+0.80	132	0,+1
BZ1210137	21	+0.30,+0.80	137	0,+1
BZ1200142	22	+0.30,+0.80	142	0,+1

规格 Type	尺寸 Dimension ( DIN1897 )			
	直径 Diameter		长度 Length	
	ØD	公差 Tol.	L	公差 Tol.
BZ1230147	23	+0.30,+0.80	147	0,+1
BZ1240152	24	+0.30,+0.80	152	0,+1
BZ1250152	25	+0.30,+0.80	152	0,+1
BZ1260157	26	+0.30,+0.80	157	0,+1
BZ1270163	27	+0.30,+0.80	163	0,+1
BZ1280163	28	+0.30,+0.80	163	0,+1
BZ1290169	29	+0.30,+0.80	169	0,+1
BZ1300169	30	+0.30,+0.80	169	0,+1
BZ1310175	31	+0.30,+0.80	175	0,+1
BZ1320181	32	+0.30,+0.80	181	0,+1
BZ1330181	33	+0.30,+0.80	181	0,+1
BZ1340187	34	+0.30,+0.80	187	0,+1
BZ1350187	35	+0.30,+0.80	187	0,+1
BZ1360194	36	+0.30,+0.80	194	0,+1
BZ1370194	37	+0.30,+0.80	194	0,+1
BZ1380201	38	+0.30,+0.80	201	0,+3
BZ1390201	39	+0.30,+0.80	201	0,+3
BZ1400201	40	+0.30,+0.80	201	0,+3

• 其它尺寸根据图纸定制 Customized

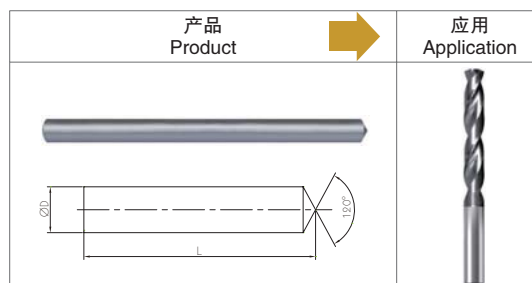
单位unit (mm)

## 毛坯尖锥棒

Rods with Tapered End



- 适用范围 Application: 直柄麻花钻(DIN338), 台阶直柄麻花钻 (DIN6537)  
For Twist Drill with Parallel Shank (DIN338), For Twist Drill with Stepped Parallel Shank (DIN6537)
- 产品优点 Advantages: 减少成型磨尖工序, 提高加工效率, 降低生产成本  
Reduce time for point grinding, improve processing efficiency, reduce production costs.



规格 Type	尺寸 Dimension (DIN338)			
	直径 Diameter		长度 Length	
	ØD	公差 Tol.	L	公差 Tol.
BZ1050087	5	+0.30,+0.50	87	0,+1
BZ1060094	6	+0.30,+0.50	94	0,+1
BZ1070110	7	+0.30,+0.60	110	0,+1
BZ1080118	8	+0.30,+0.60	118	0,+1
BZ1090126	9	+0.30,+0.60	126	0,+1
BZ1100134	10	+0.30,+0.60	134	0,+1
BZ1110143	11	+0.30,+0.60	143	0,+1
BZ1120152	12	+0.30,+0.60	152	0,+1
BZ1130152	13	+0.30,+0.70	152	0,+1
BZ1140161	14	+0.30,+0.70	161	0,+1
BZ1150170	15	+0.30,+0.70	170	0,+1
BZ1160179	16	+0.30,+0.70	179	0,+1
BZ1170185	17	+0.30,+0.80	185	0,+1
BZ1180192	18	+0.30,+0.80	192	0,+1
BZ1190199	19	+0.30,+0.80	199	0,+1
BZ1200206	20	+0.30,+0.80	206	0,+3

规格 Type	尺寸 Dimension (DIN6537)			
	直径 Diameter		长度 Length	
	ØD	公差 Tol.	L	公差 Tol.
BZ1060063	6	+0.30,+0.50	63	0,+1
BZ1080080	8	+0.30,+0.60	80	0,+1
BZ1100090	10	+0.30,+0.60	90	0,+1
BZ1120103	12	+0.30,+0.60	103	0,+1
BZ1140108	14	+0.30,+0.70	108	0,+1
BZ1160116	16	+0.30,+0.70	116	0,+1
BZ1180124	18	+0.30,+0.80	124	0,+1
BZ1200132	20	+0.30,+0.80	132	0,+1

• 其它尺寸根据图纸定制 Customized

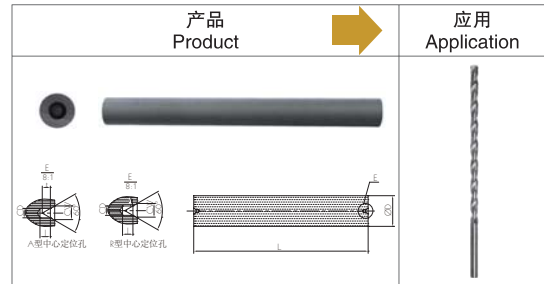
单位unit (mm)

## 毛坯带定位孔棒材

Rods with Centers



- 适用范围 Application: 大长径比刀具/Long Tools with Large L:D ratios.
- 产品优点 Advantages: 为大长径比刀具开槽提供定位 Precision grinding of long tools between centers.



规格 Type	直径 Diameter		长度 Length	
	ØD	公差 Tol.	L	公差 Tol.
BK01030125	3	+0.30,+0.50	125	0,+1
BK01040105	4	+0.30,+0.50	105	0,+1
BK01040125	4	+0.30,+0.50	125	0,+1
BK01050105	5	+0.30,+0.50	105	0,+1
BK01050125	5	+0.30,+0.50	125	0,+1
BK01060105	6	+0.30,+0.50	105	0,+1
BK01060125	6	+0.30,+0.50	125	0,+1
BK01060145	6	+0.30,+0.50	145	0,+1
BK01070100	7	+0.30,+0.60	100	0,+1
BK01070105	7	+0.30,+0.60	105	0,+1
BK01070145	7	+0.30,+0.60	145	0,+1
BK01080100	8	+0.30,+0.60	100	0,+1
BK01090100	9	+0.30,+0.60	100	0,+1
BK01100100	10	+0.30,+0.60	100	0,+1
BK01100120	10	+0.30,+0.60	120	0,+1
BK01100125	10	+0.30,+0.60	125	0,+1

•  $3 \leq \text{ØD} \leq 40$  mm 可订制 Additional dimension on request ( $3 \leq \text{ØD} \leq 40$  mm)  
其它尺寸根据图纸定制 Customized

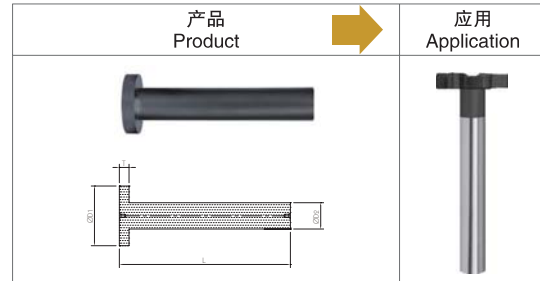
单位unit (mm)

## 毛坯T形棒

T-Slot Endmill Blanks



- 适用范围 Application area: T型刀/T-Slot Endmills
- 产品优点 Advantages: 减少砂轮磨损, 提高加工效率, 降低生产成本  
Reduce grinding time, improve processing efficiency, reduce production costs.



规格 Type	直径 Diameter		长度 Length		台阶长度 Step Length		台阶直径 Step Diameter	
	ØD1	公差 Tol.	L	公差 Tol.	T	公差 Tol.	ØD2	公差 Tol.
BT0317010401	17.0	0,+0.4	104	0,+2	4.0	± 0.3	10.3	± 0.3
BT0321010801	21.0	0,+0.4	108	0,+2	8.0	± 0.3	10.3	± 0.3
BT0327011001	27.0	0,+0.4	110	0,+2	10.0	± 0.3	12.3	± 0.3
BT0333015401	33.0	0,+0.4	154	0,+2	4.0	± 0.3	16.3	± 0.3
BT0337015801	37.0	0,+0.4	158	0,+2	8.0	± 0.3	16.3	± 0.3
BT0341316001	41.3	0,+0.4	160	0,+2	10.0	± 0.3	20.3	± 0.3

• 15 ≤ ØD1 ≤ 42 mm 可订制 Additional dimension on request ( 15 ≤ ØD1 ≤ 42 mm )  
其它尺寸根据图纸定制 Customized

单位unit (mm)

## 其他

### Other Preformed Blanks

	定制 Custom Made								
	L	L1	L2	A1	A2	D1	D2	a	
	定制 Custom Made								
	L1	L2	A1	A2	D1	D2	a		
	定制 Custom Made								
	L	D	A						
	定制 Custom Made								
	L	D1	D2	D3	A	B			



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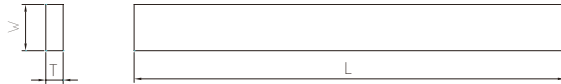
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# Plates

板材产品

# 四边型材

STB



规格 Type	宽度 W	厚度 T	长度 L
TS0103003001	3	3	330
TS0104002001	4	2	330
TS0104004001	4	4	330
TS0105002001	5	2	330
TS0105003001	5	3	330
TS0105004001	5	4	330
TS0105005001	5	5	330
TS0106002001	6	2	330
TS0106002501	6	2.5	330
TS0106003001	6	3	330
TS0106004001	6	4	330
TS0106005001	6	5	330
TS0106006001	6	6	330
TS0107002001	7	2	330
TS0107003001	7	3	330
TS0107004001	7	4	330
TS0107005001	7	5	330
TS0108002001	8	2	330
TS0108002501	8	2.5	330
TS0108003001	8	3	330
TS0108004001	8	4	330
TS0108005001	8	5	330

规格 Type	宽度 W	厚度 T	长度 L
TS0108006001	8	6	330
TS0108008001	8	8	330
TS0109002001	9	2	330
TS0110002001	10	2	330
TS0110002501	10	2.5	330
TS0110003001	10	3	330
TS0110004001	10	4	330
TS0110005001	10	5	330
TS0110006001	10	6	330
TS0110010001	10	10	330
TS0112002001	12	2	330
TS0112002501	12	2.5	330
TS0112003001	12	3	330
TS0112004001	12	4	330
TS0112005001	12	5	330
TS0112006001	12	6	330
TS0112012001	12	12	330
TS0113004001	13	4	330
TS0113005001	13	5	330
TS0113006001	13	6	330
TS0114002001	14	2	330
TS0114002501	14	2.5	330

续/continued on next page

单位unit (mm)

## 四边型材

STB



规格 Type	宽度 W	厚度 T	长度 L
TS0114003001	14	3	330
TS0114004001	14	4	330
TS0114005001	14	5	330
TS0114006001	14	6	330
TS0114014001	14	14	330
TS0115003001	15	3	330
TS0115005001	15	5	330
TS0115006001	15	6	330
TS0116002001	16	2	330
TS0116002501	16	2.5	330
TS0116003001	16	3	330
TS0116004001	16	4	330
TS0116005001	16	5	330
TS0116006001	16	6	330
TS0116016001	16	16	330
TS0118002001	18	2	330
TS0118002501	18	2.5	330
TS0118003001	18	3	330
TS0118004001	18	4	330
TS0118005001	18	5	330
TS0118006001	18	6	330
TS0120002001	20	2	330

规格 Type	宽度 W	厚度 T	长度 L
TS0120002501	20	2.5	330
TS0120003001	20	3	330
TS0120004001	20	4	330
TS0120005001	20	5	330
TS0120006001	20	6	330
TS0122003001	22	3	330
TS0122004001	22	4	330
TS0122005001	22	5	330
TS0122006001	22	6	330
TS0125003001	25	3	330
TS0125004001	25	4	330
TS0125005001	25	5	330
TS0126006001	26	6	330
TS0128003001	28	3	330
TS0128004001	28	4	330
TS0128005001	28	5	330
TS0128006001	28	6	330
TS0130003001	30	3	330
TS0130004001	30	4	330
TS0130005001	30	5	330
TS0130006001	30	6	330

单位unit (mm)

## 四边型材

STB



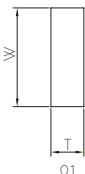
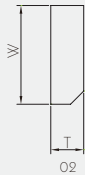

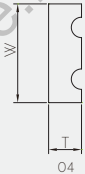
规格 Type	宽度 W	厚度 T	长度 L
TS0104703101	3/16	1/8	12
TS0104704701	3/16	3/16	12
TS0106303101	1/4	1/8	12
TS0106304701	1/4	3/16	12
TS0106306301	1/4	1/4	12
TS0107903101	5/16	1/8	12
TS0107904701	5/16	3/16	12
TS0109503101	3/8	1/8	12
TS0109504701	3/8	3/16	12
TS0109506301	3/8	1/4	12
TS0109509501	3/8	3/8	12
TS0112703101	1/2	1/8	12
TS0112704701	1/2	3/16	12
TS0112706301	1/2	1/4	12

规格 Type	宽度 W	厚度 T	长度 L
TS0112709501	1/2	3/8	12
TS0115803101	5/8	1/8	12
TS0115804701	5/8	3/16	12
TS0115806301	5/8	1/4	12
TS0119003101	3/4	1/8	12
TS0119004701	3/4	3/16	12
TS0119006301	3/4	1/4	12
TS0119009501	3/4	3/8	12
TS0125403101	1	1/8	12
TS0125404701	1	3/16	12
TS0125406301	1	1/4	12
TS0125409501	1	3/8	12
TS0131706301	1-1/4	3/16	12
TS0131706301	1-1/4	1/4	12

单位unit (inch)

## 四边型材

STB

形状代码 Shape Code	说明 Illustration	截面图示 Cross Section
01	表示矩形截面 Rectangular Cross Section	
02	表示矩形截面带单倒角 Rectangular Cross Section with Chamfer	
03	表示矩形截面带双倒角 Rectangular Cross Section with Two Chamfers	
04	表示宽面带圆弧 Width with Circular Arc	

## 订货示例

### Ordering Example

以物料编码H0U20BR1020330为例,订货需求表见以下范例

Take H0U20BR1020330 for example,see the following Ordering Table

订货需求表 Ordering Table						
序号 NO.	牌号 Grade	产品类别 Product Category	规格 Type	公差 Tol.	数量 Amounts	备注 Remark
1	GU20	H0	BR1020330	GESAC 标准	500	
2						

\* 不注明公差, 则默认GESAC 标准 It will be taken as GESAC standard, if no tolerance is offered.

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## 公差等级

### Carbide Rod Tolerances

#### 精磨外径公差

#### Tol. of Ground Rods' Diameter

DIAMETER	h5	h6	h7
0-3.0mm 0-0.1181 in.	0.004 mm 0.00015 in.	0.006 mm 0.00024 in.	0.010 mm 0.00039 in.
3.001-6.0mm 0.1181 - 0.2362 in.	0.005 mm 0.00020 in.	0.008 mm 0.00031 in.	0.012 mm 0.00047 in.
6.001-10.0 mm 0.2363 - 0.3937 in.	0.006 mm 0.00024 in.	0.009 mm 0.00035 in.	0.015 mm 0.00059 in.
10.001-18.0 mm 0.3938 - 0.7087 in.	0.008 mm 0.00031 in.	0.011 mm 0.00043 in.	0.018 mm 0.00071 in.
18.001-30.0 mm 0.7088 - 1.1811 in.	0.009 mm 0.00035 in.	0.013 mm 0.00051 in.	0.021 mm 0.00083 in.
30.001-50.0 mm 1.1812 - 1.9685 in.	0.011 mm 0.00043 in.	0.016 mm 0.00063 in.	0.025 mm 0.00098 in.

“h” 的公差均为+0.0/-  
“h” Tolerance all +0.0/-

#### 棒材表面粗糙度

#### Surface Roughness of Rods

类型 Type	精度 Accuracy
镜面棒材 Polished Rods	0.00-0.05 $\mu$ m
亚光洁度 Dull Finished	0.10-0.20 $\mu$ m
精磨棒材 Ground Rods	0.00-0.10 $\mu$ m

#### 圆度

#### Roundness Tolerance

不论外径、长度，精磨圆棒圆度标准均为0.002 mm  
The standard roundness tolerance of the ground rod is 0.002 mm.

## 材质项目名词解释 Definitions of Physical Properties

### ★ 硬度 Hardness

金属材料抵抗其它更硬物体压入表面的能力称为硬度，主要采用洛氏或维氏硬度测量法，两种硬度值转换时需要注意换算  
The Hardness of material is defined as the ability to fight against the hard pressed into surface of the object, mainly using measurements of Rockwell and Vickers. As the principles of the Vickers and Rockwell tests are different, care must be taken when converting from one system to the other.

### ★ 矫顽磁力 Coercive Field Strength

矫顽磁力测量的是合金试样完全去磁化所需的反向磁场大小，它可用来评定合金的组织状况，矫顽力随钴含量降低而增大，当钴含量一定时，碳化钨晶粒越细，钴相分散程度越高，矫顽力也越大  
Coercive Field Strength is a measure of the residual magnetism in the hysteresis loop when the Cobalt (Co) binder in grade of cemented carbide is magnetized and then demagnetized. It can be used to assess the status of alloy organization. The finer the grain size of the carbide phase the higher will be the coercive force value.

### ★ 密度 Density

材料的密度（比重）是材料质量与其体积的比率，使用液体置换法进行测定，硬质合金密度随WC-Co相中钴含量增加而增加  
The Density (specific gravity) of a material is the ratio of its mass to its volume. It is measured using a water displacement technique. Cemented carbide density decreases linearly with increasing Cobalt content for the Wc-Co grades.

### ★ 抗弯强度 Transverse Rupture Strength

抗弯强度是表征材料抵抗弯曲不断裂的能力，即试样跨距中点加载负荷至断裂时，单位面积上所受的力大小  
Transverse Rupture Strength (TRS) is the ability of material to resist bending, measured at the breaking point of a material in a standard three point bend test.

### ★ 金相 Metallographic Analysis

硬质合金烧结钴相粘结后，过量钴可能在某些结构区域中存在，形成“钴池”；而当粘结相不完全粘结，则将形成一些少量残余孔隙，合金中钴池及孔隙率使用金相显微镜检验得到  
Cobalt Lakes will bond after sintering, excess cobalt may exist in certain area of the structure, forming the cobalt pool; If bonding phase is incompletely adhesive, there will form some residual pores. Cobalt pools and porosity can be detected by using metallographic microscope.

### ★ 磁饱和 Magnetic Saturation

磁饱和是最大磁化强度与质量的比值，通过测定硬质合金中具有磁性的钴（Co）粘结相的磁饱和，可以评定合金成份。低磁饱和值表示合金含碳量低，或者含有 $\eta$ 相碳化物，高磁饱和值表示存在“游离碳或石墨”  
Magnetic Saturation: is the ratio of magnetic intensity to quality. Magnetic Saturation measurements on the Cobalt (Co) binder phase in cemented carbide are used by the industry to evaluate its composition. Low Magnetic Saturation values indicate a low carbon level and/or the presence of Eta-Phase Carbides. High Magnetic Saturation values indicate the presence of 'free-carbon' or Graphite.

### ★ 断裂韧性 Toughness

断裂韧性 $K_{Ic}$ 是含有临界尺寸缺陷的试样的强度测量尺度，它反映材料塑性变形和断裂全过程中吸收能量的能力，是强度和塑性的综合表现，使用维氏压痕法测定  
Fracture toughness reflects the ability of material to absorb energy in the process of plastic deformation and fracture. Fracture toughness is the performance of strength and the plasticity, which is measured by Vickers.

### ★ 总碳含量 Carbon Content

碳化钨（WC）中理想碳含量范围是6.05-6.14%，高于6.14%，将导致组分中明显的碳过量，超过化学计量值，形成“游离碳”，少于6.02%，将形成 $\eta$ 相碳化物  
The ideal amount of Carbon in Tungsten Carbide (WC) is 6.13% by weight. An acceptable range of Carbon is 6.05-6.14%, any amount less than 6.02% will result in visible Carbon deficiency by the formation of the Eta-Phase carbides, any amount greater than 6.14% will result in a visible Carbon excess by the formation of free-carbon, graphite in the microstructure.



## 材质检测仪器

Inspection and Test Equipment



### CBT305型微机控制电子抗折试验机 Electronic Universal Testing Machine

GB/T3851-1983≈ISO3327-1982  
ASTM B406-1996



### RB2000R型洛氏硬度计 Rockwell Hardness Tester

美国威尔逊 (USA Wilson)  
GB/T3849-1983≈ISO3788/1-1982  
ASTM B294-1992



### LDJ-5800型磁性能仪 Magnetometer

进口磁饱和矫顽磁力测试一体机



### XS105电子天平 Electronic Balance

瑞士梅特勒 (METTLER TOLEDO)  
GB/T3850≈ISO3369  
ASTM B294

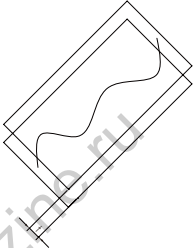
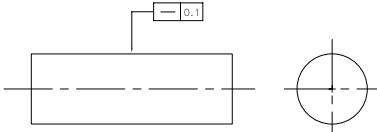
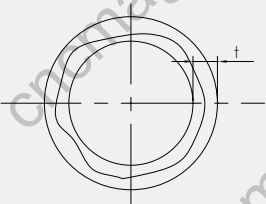
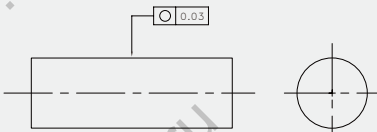
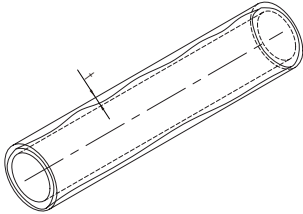
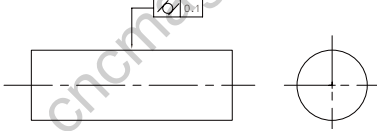


### Imager.A2m金相显微镜 Metallographic Microscope

蔡司光学仪器 (CarlZeiss)  
GBT3479-1983≈ISO4505-1978 ASTM B276-2005  
高倍 GBT3448-1983≈ISO4499-1978 ASTM B390-1992

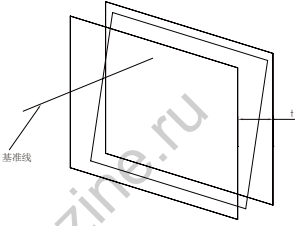
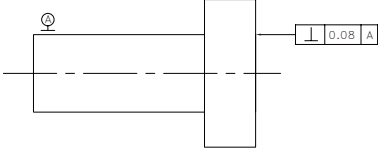
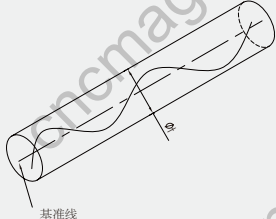
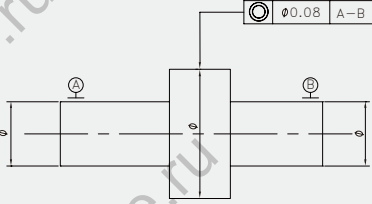
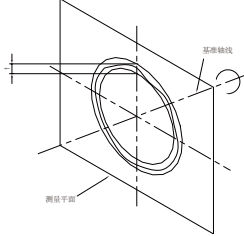
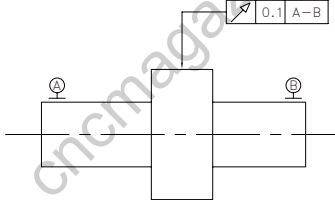
## 尺寸项目名词

### Definitions of Geometrical Tolerance

	公差带定义 Definition of Tolerance Zone	标注和解释 Indication and Explanation
<p>直线度 Straightness Tolerance</p>	 <p>在给定方向上公差带是距离为公差值t的两平行平面之间的区域 The tolerance zone, in the considered plane, is limited by two parallel straight lines a distance t apart and in the specified direction only.</p>	 <p>被测圆柱面的任一素线必须位于距离为公差值0.1的两平行平面之内 Any extracted (actual) line on the upper surface, parallel to the plane of projection in which the indication is shown, shall be contained between two parallel straight lines 0.1 apart.</p>
<p>圆度 Roundness Tolerance</p>	 <p>公差带是在同一正截面上，半径值为公差值t的两同心圆之间的区域 The tolerance zone, in the considered cross-section, is limited by two concentric circles with a difference in radii of t.</p>	 <p>被测圆柱面任一正截面的圆周必须位于半径差为公差值0.03的两同心圆之间 The extracted (actual) circumferential line, in any cross-section of the cylindrical and conical surfaces, shall be contained between two co-planar concentric circles, with a difference in radii of 0.03.</p>
<p>圆柱度 Cylindricity</p>	 <p>公差带是半径差为公差值t的两同轴圆柱面之间的区域 The tolerance zone is limited by two coaxial cylinders with a difference in radii of t.</p>	 <p>公差带是在同一正截面上，半径值为公差值t的两同心圆之间的区域 The tolerance zone, in the considered cross-section, is limited by two concentric circles with a difference in radii of t.</p>

## 尺寸项目名词

### Definitions of Geometrical Tolerance

	公差带定义 Definition of Tolerance Zone	标注和解释 Indication and Explanation
<p>垂直度 Perpendicularity Tolerance of a Surface</p>	 <p>公差带是距离为公差值t且垂直于基准线的两平行平面之间的区域 The tolerance zone is limited by two parallel planes a distance apart and perpendicular to the datum.</p>	 <p>被测面必须位于距离为公差值0.08且垂直于基准线A(基准轴线)的两平行平面之间 The extracted (actual) surface shall be contained between two parallel planes 0.08 apart that is perpendicular to datum axis A.</p>
<p>同轴度 Concentricity Tolerance of a Point</p>	 <p>公差带是直径为公差值<math>\phi t</math>的圆柱面内区域, 该圆柱面的轴线与基准轴线同轴 The tolerance zone is limited by a circle of diameter t; the tolerance value shall be preceded by the symbol <math>\phi</math>. The centre of the circular tolerance zone coincides with the datum point.</p>	 <p>大圆柱面的轴线必须位于直径为公差值<math>\phi 0.08</math>且与公共基准线A-B(公共基准轴线)同轴的圆柱面内 The extracted (actual) median line of the tolerance cylinder shall be within a cylindrical zone of diameter 0.08 the axis of which is the common datum straight line A-B.</p>
<p>圆跳动 Circular run-out Tolerance</p>	 <p>公差带是在垂直于基准轴线的任一半径位置的测量平面内、半径差为公差值t且圆心在基准轴线上的两同心圆之间的区域 The tolerance zone is limited within any cross-section perpendicular to the datum axis by two concentric circles with a difference in radii of t, the centers of which coincide with the datum.</p>	 <p>当被测要素围绕公共基准线A-B(公共基准轴线)旋转一周时, 在任一测量平面内的径向圆跳动均不得大于0.1 The extracted (actual) line in any cross-section plane perpendicular to common datum straight line A-B shall be contained between two coplanar concentric circles with a difference in radii of 0.1.</p>

## 硬度换算表

### Hardness Comparison

布氏硬度10mm球 荷重3000kg			洛氏硬度(3R)				维氏硬度 HV 荷重 30kg
标准球 Standard Ball	Hult Green 球	碳化钨球 Carbide Ball	HRA 荷重60kg 金刚石	HRB 荷重100kg 1/6"球	HRC 荷重150kg 金刚石	HRD 荷重100kg 金刚石	
-	-	-	92.5	-	80.5	-	1700
-	-	-	92.0	-	80.0	-	1600
-	-	-	91.5	-	79.0	-	1550
-	-	-	91.0	-	78.0	-	1500
-	-	-	90.5	-	77.0	-	1450
-	-	-	90.0	-	76.0	-	1400
-	-	-	89.5	-	75.0	-	1350
-	-	-	89.0	-	74.0	-	1300
-	-	-	88.5	-	73.0	-	1250
-	-	-	88.0	-	72.0	-	1200
-	-	-	87.5	-	71.5	-	1150
-	-	-	87.0	-	71.0	-	1140
-	-	-	86.5	-	70.0	-	1076
-	-	-	86.0	-	69.0	-	1004
-	-	-	85.6	-	68.0	76.9	940
-	-	-	85.3	-	67.5	76.5	920
-	-	-	85.0	-	67.0	76.1	900
-	-	767	84.7	-	66.4	75.7	880
-	-	757	84.4	-	65.9	75.3	860
-	-	745	84.1	-	65.3	74.8	840
-	-	733	83.8	-	64.7	74.3	820
-	-	722	83.4	-	64.0	73.8	800
-	-	710	83.0	-	63.3	73.3	780
-	-	698	82.6	-	62.5	72.6	760
-	-	684	82.2	-	61.8	72.1	740
-	-	670	81.8	-	61.0	71.5	720
-	615	656	81.3	-	60.1	70.8	700
-	610	647	81.1	-	59.7	70.5	690
-	603	638	80.8	-	59.2	70.1	680
-	597	630	80.6	-	58.8	69.8	670
-	590	620	80.3	-	58.3	69.4	660
-	585	611	80.0	-	57.8	69.0	650
-	578	601	79.8	-	57.3	68.7	640
-	571	591	79.5	-	56.8	68.3	630

## 硬度换算表 Hardness Comparison

布氏硬度10mm球 荷重3000kg			洛氏硬度(3R)				维氏硬度 HV 荷重 30kg
标准球 Standard Ball	Hult Green 球	碳化钨球 Carbide Ball	HRA 荷重60kg 金刚石	HRB 荷重100kg 1/6"球	HRC 荷重150kg 金刚石	HRD 荷重100kg 金刚石	
-	564	582	79.2	-	56.3	67.9	620
-	557	573	78.9	-	55.7	67.5	610
-	550	564	78.6	-	55.2	67.0	600
-	542	554	78.4	-	54.7	66.7	590
-	535	545	78.0	-	54.1	66.2	580
-	527	535	77.8	-	53.6	65.8	570
-	519	525	77.4	-	53.0	65.4	560
505	512	517	77.0	-	52.3	64.8	550
496	503	507	76.7	-	51.7	64.4	540
488	495	497	76.4	-	51.1	63.9	530
480	487	488	76.1	-	50.5	63.5	520
473	479	479	75.7	-	49.8	62.9	510
465	471	471	75.3	-	49.1	62.2	500
456	460	460	74.9	-	48.4	61.6	490
448	452	452	74.5	-	47.7	61.3	480
441	442	442	74.1	-	46.9	60.7	470
433	433	433	73.6	-	46.1	60.1	460
425	425	425	73.3	-	45.3	59.4	450
415	415	425	72.8	-	44.5	58.8	440
405	405	405	72.3	-	43.6	58.2	430
397	397	397	71.8	-	42.7	57.7	420
388	388	388	71.4	-	41.8	56.8	410
379	379	379	70.8	-	40.8	56.0	400
369	369	369	70.3	-	39.8	55.2	390
360	360	360	69.8	(110.0)	38.8	54.4	380
350	350	350	69.2	-	37.7	53.6	370
341	341	341	69.7	(109.0)	36.6	52.8	360
331	331	331	68.1	-	35.5	51.9	350
322	322	322	67.6	(108.0)	34.4	51.1	340
313	313	313	67.0	-	33.3	50.2	330
303	303	303	66.4	(107.0)	32.2	49.4	320
294	294	294	65.8	-	31.0	48.4	310
284	284	284	65.2	(105.5)	29.8	47.5	300
280	280	280	64.8	-	29.2	47.1	295

## 硬度换算表

### Hardness Comparison

布氏硬度10mm球 荷重3000kg			洛氏硬度(3R)				维氏硬度 HV 荷重 30kg
标准球 Standard Ball	Hult Green 球	碳化钨球 Carbide Ball	HRA 荷重60kg 金刚石	HRB 荷重100kg 1/6"球	HRC 荷重150kg 金刚石	HRD 荷重100kg 金刚石	
275	275	275	64.5	(104.5)	28.5	46.5	290
270	270	270	62.4	-	27.8	46.0	285
265	265	265	63.8	(103.5)	27.1	45.3	280
261	261	261	63.5	-	26.4	44.9	275
256	256	256	63.1	(102.0)	25.6	44.3	270
252	252	252	62.7	-	24.8	43.7	265
247	247	247	62.4	(101.0)	24.0	43.1	260
243	243	243	62.0	-	23.1	42.2	255
238	238	238	61.6	99.5	22.2	41.7	250
233	233	233	61.2	-	21.3	41.1	245
228	228	228	60.7	98.1	20.3	40.3	240
219	219	219	-	96.7	(18.0)	-	230
209	209	209	-	95.0	(15.7)	-	220
200	200	200	-	93.4	(13.4)	-	210
190	190	190	-	91.5	(11.0)	-	200
181	181	181	-	89.5	(8.5)	-	190
171	171	171	-	87.1	(6.0)	-	180
162	162	162	-	85.0	(3.0)	-	170
152	152	152	-	81.7	(0.0)	-	160
143	143	143	-	78.7	-	-	150
133	133	133	-	75.8	-	-	140
124	124	124	-	71.2	-	-	130
114	114	114	-	66.7	-	-	120
105	105	105	-	62.3	-	-	110
95	95	95	-	56.2	-	-	100
90	90	90	-	52.0	-	-	95
86	86	86	-	48.0	-	-	90
81	81	81	-	41.0	-	-	85





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