

联系方式 Contact Information



地址: 中国·四川省成都市龙泉驿区驿都中路299号
Address: No. 299, Middle Yidu Road, Longquanyi Distrit, Chengdu City, Sichuan Province, China
邮编/P.C: 610100
销售电话/Tel: 028-84885533 028-84885559
传真/Fax: 028-84885550
网址/http:// www.zgcc.com
E-mail: Sale_xc@zgcc.com



扫一扫二维码
关注公司微信平台

客户服务 Customer Service

专业的营销团队和技术服务队伍, 提供满足个性的专业产品和完整解决方案。

国内销售电话 Domestic Sales Tel.: (028)84885533 84885559

国际销售电话 International Sales Tel.: 0086-813-5516691



ZGCC

硬质合金型材

CEMENTED CARBIDE RODS AND BARS

GREAT WALL



中国五矿

CMT 自贡硬质合金有限责任公司成都分公司
ZIGONG CEMENTED CARBIDE CORP., LTD. CHENGDU BRANCH



APPLICATION
SECTOR



中国五矿

CMT 自贡硬质合金有限责任公司成都分公司



ISO9001:
CN-CQC08G10970
ISO14001:
CN-CQC08E22096



体系认证
CNAS C001-Q

品质成就未来

QUALITY ACCOMPLISHES THE FUTURE

自贡硬质合金有限责任公司

- 世界500强企业中国五矿的核心成员
- 中国第一家自主设计建设的大型硬质合金企业
- 国内领先的硬质合金及配套工具制造商
- 世界先进水平的表面工程技术服务提供商
- 国内领先的钨钼制品制造商



ZIGONG CEMENTED CARBIDE CO., LTD.

- Zigong Cemented Carbide Co., Ltd.(ZGCC) is a core member of China Minmetals which is one of the world 500 top companies.
- It is the first home-designed and built large scale cemented carbide manufacturing enterprise in China.
- It is one of the leading manufacturers of cemented carbides and related tools at home.
- It's a reliable supplier of the surface engineering technology with advanced world levels and their application services.
- It holds the leadership position in the tungsten and molybdenum product manufacture in China.



- 引进美国先进工艺
- 采用高品质专用原料
- 先进的生产技术和设备
- 严格的生产工艺控制和质量保证体系
- 积累三十年专业生产经验
- Advanced technology imported from the United States.
- Excellent sourcing of high quality virgin materials.
- Advanced manufacturing machinery and equipment.
- Stringent quality control and quality assurance regulations.
- 30 years of specialised experience in manufacturing and producing.

目录 Contents

01

硬质合金型材牌号

Grades of Cemented Carbide Rods and Bars

03

金属陶瓷

Cermet

15

深孔钻坯料

Blanks for Deep Hole Drills

18

挤压板条产品

Cemented Carbide Bars

20

附录
Appendix

02

硬质合金型材牌号推荐

Recommended Applications of the Grades

05

整体刀具用型材规格

Sizes and Dimensions of Cemented Carbide Rods and Bars

17

肾形孔枪钻钻头

Gun Drill Bits with Kidney-Shaped Hole

19

非常规材料/形状产品

Special Products

» 硬质合金型材牌号

Grades of Cemented Carbide Rods and Bars

“长城”牌硬质合金型材，牌号种类丰富、产品规格齐全，更有专业的开发设计能力，可以满足客户的多样化、定制化需求，成就高性能刀具是“长城”牌硬质合金型材对客户使命。

Our competitive products "Great Wall" cemented carbide rods and bars not only have a variety of grades and specifications, but also satisfy the diversified and customized demands of our customers. "Provide high quality cemented carbide rods and bars to our customer" is our mission!

牌号 Grade	ISO编码 ISO Code	晶粒度 Grain Size μm	钴 Cobalt wt %	密度 Density g/cm ³	硬度 Hardness		抗弯强度 TRS N/mm ²
					HRA	HV30	
ZS31	K20-K40	0.8	10.0	14.42	91.5	1550	4200
ZS40	K20-K30	0.4	12.0	14.15	92.5	1700	4000
ZS50	K30-K40	0.5	13.0	14.10	91.7	1560	4200
ZK15F	K10-K20	0.8	6.0	14.95	92.8	1720	3600
ZK10UF	K05-K10	0.6	6.0	14.85	93.0	1800	3500
ZK30UF	K30-K40	0.6	10.0	14.45	92.0	1630	3800
ZK31UF	K20-K40	0.7	10.0	14.40	91.8	1600	4000
ZK10SF	K05-K10	0.4	6.0	14.75	94.0	2000	3500
ZK25SF	K05-K10	0.2-0.3	9.0	14.30	94.0	1950	4400
ZK30SF	K10-K20	0.4	10.0	14.30	92.5	1750	3800
ZK40SF	K20-K30	0.4	12.0	14.15	92.2	1630	4000
ZK45SF	K20-K30	0.4	11.5	14.10	92.3	1670	4000

注/Note 1: 表中数据为典型值，仅供参考，我们保留因公司技术进步而修改数据权利。

The values displayed in the table above are for reference only. We reserve the eventual right to make alterations and modifications to the data with the aim of technological improvement.

2: 表中抗弯强度检测样品尺寸为φ3.25mm×38.5mm,

The size of TRS specimens is φ3.25mm×38.5mm.

» 硬质合金型材牌号推荐

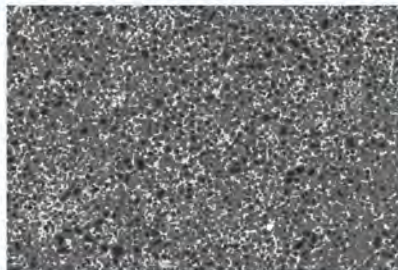
Recommended Applications of the Grades

近纳米 晶合金 Near Nano Grades	牌号 Grade	使用推荐 Applications
	ZK25SF	适用于淬硬钢 (HRC55以上)，不锈钢，铝合金。纤维增强复合材料等加工。 Suitable for finish-machining of hardened steel (above HRC55), stainless steel, aluminum alloy, as well as composite materials, eg. GFRP.

超细晶合金 Ultrafine Grades	牌号 Grade	使用推荐 Applications
	ZK10SF	适用于高硬材料、复合材料加工，推荐制作软刀、PCB刀具、雕刻刀。 Suitable for high hardness materials, composite materials, making reamers, PCB tools, gravers.
	ZS40	高硬度、高强度和耐磨性的最佳组合，适用铝合金、钛合金、耐热合金及淬硬钢的加工。 Grade with an excellent combination of high hardness, high strength and wear resistance. Suitable for aluminum alloy, titanium alloy and heat-resistant alloy and hardened steel.
	ZK45SF	推荐制作高速铣刀，推荐用于不锈钢、合金钢、铝合金、钛合金的铣削加工。 Recommended for milling of stainless steel, alloy steel, aluminum alloy, titanium alloy.
	ZK40SF	适用于不锈钢、模具钢、铝合金、钛合金的铣削加工。 Suitable for milling of stainless steel, die steel, aluminum alloy, titanium alloy.
ZS50	具有优异的韧性，适用于不锈钢、合金钢等材料的粗、精加工。 With high toughness for high performance machining of stainless steel, alloy steel etc.	

亚微米合金 Submicron Grades	牌号 Grade	使用推荐 Applications
	ZK10UF	适用于有色金属、铝合金、塑料材料、石墨（金刚石涂层）的切削加工。 Suitable for machining nonferrous metals, aluminum alloy, various plastics and graphite (with diamond coating).
	ZK15F	适用于金刚石涂层，具有优异的耐磨性，适用于铝合金、复合材料有色金属、的切削加工。 Formulated for use with diamond coating, offering outstanding wear resistance. Suitable for aluminum alloy, composites and non-ferrous materials.
	ZS31	具有优异的韧性，适用于不锈钢、合金钢、钛合金、高温合金等材料的切削加工。 Offering high toughness for cutting stainless steel, alloy steel, titanium alloy, high temperature alloy etc. materials.
	ZK31UF	通用材质，适用于不锈钢、合金钢、有色金属等材料的切削加工。 For general use of milling and drilling, suitable for cutting stainless steel, alloy steel, die steel, nonferrous metals etc. materials.
ZK30UF	适用于不锈钢、模具钢、铸铁等材料的切削加工。 Suitable for cutting stainless steel, die steel, grey cast iron.	

» 金属陶瓷
Cermet



» 磨削加工建议

Grinding Operation of Cermet

金属陶瓷属于硬脆性材料，导热性、抗热冲击性比WC基硬质合金差，在加工时应特别注意散热，并避免受到大的机械应力及热交变应力的冲击。建议使用高刚度、高稳定的磨床，并采用粗磨、半精磨和精磨分步加工工艺，选用散热性、自锐性好的烧结金刚石砂轮，陶瓷结合剂金刚石砂轮最佳。

As a kind of brittle material, the thermal conductivity and thermal shock resistance of Cermet relatively weaker in comparison with WC based Cemented Carbide. Thus, more attention must be used to heat dispersion when grinding, avoiding too high mechanical or heatless shock. Step by step grinding process, such as rough, pre-finishing finish grinding, is recommended. Use a heavy, stable and rigid machine where you can control your speed and feeds. The metal bond diamond wheel with good thermal conductivity and self-sharpening is chosen, ceramic bond ground wheel is preferred.

牌号 Grades	ISO 范围 ISO Class	硬度* Hardness*		密度* Density* g/cm ³	抗弯强度* TRS* MPa	断裂韧性* Density* MPa·m ^{1/2}	孔隙度 Porosity
		HRA	HV30				
ZYT10	P01-P10	93.5	1620	6.4	1980	7.8	A02800C00
ZYT10A	P01-P10	92.8	1580	7.0	2250	8.1	A02800C00
ZYT15	P10-P20	92.0	1520	6.5	2140	8.8	A02800C00
ZYT15A	P10-P20	91.8	1500	6.7	2400	9.0	A02800C00

工序 Procedure	砂轮种类 Grinding wheel	砂轮粒度 Particle size of diamond wheel	进给量 Feed	冷却方式 Coolant
粗磨 Rough		80#-100#	≤0.020	
半精磨 Pre-finishing	陶瓷或金属结合剂金刚石砂轮， 浓度75-100% Ceramic or metal bond diamond wheel with 75-100 concentration	120#-200#	≤0.010	均匀充分冷却 或干磨 Good and rich coolant or Dry machining
精磨 Finishing		200#-400#	≤0.005	

注/Note: 1. 表中数据为典型值，仅供参考，我们保留因公司技术进步而修改数据的权利。

The values displayed in the table above are for reference only. We reserve the eventual right to make alterations and modifications to the data with the aim of technological improvement.

2. 表中抗弯强度检测试样尺寸为φ3.25mm×38.5mm,

The size of TRS specimen is φ3.25mm×38.5mm.

» 整体刀具用型材规格

Sizes and Dimensions of Cemented Carbide Rods and Bars

» 标准尺寸毛坯棒材

Normal Dimension Unground Rods



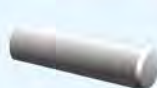
单位: mm

尺寸与公差/Dimension & Tolerance			
直径 D	直径公差 Tol. D	长度 L	长度公差 Tol. L
0.5			
1.0			
1.5			
2.0	+0.50		
2.5	+0.20		
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0	+0.55		
6.5	+0.20		
7.0			
7.5		310/330	+5.0
8.0			+0
8.5			
9.0			
9.5			
10.0			
10.5			
11.0			
11.5			
12.0	+0.55		
12.5	+0.25		
13.0			
13.5			
14.0			
14.5			

尺寸与公差/Dimension & Tolerance			
直径 D	直径公差 Tol. D	长度 L	长度公差 Tol. L
15.0			
15.5			
16.0			
16.5			
17.0			
18.0			
19.0			
20.0			
21.0			
22.0			
23.0			
24.0			
25.0			
26.0	+0.55	310/330	+5.0
27.0	+0.25		0
28.0			
29.0			
30.0			
31.0			
32.0			
33.0			
34.0			
35.0			
36.0			
37.0			
38.0			
39.0			
40.0			

» 公制精度倒角定尺寸棒材 (h5/h6)

Ground Rods with Chamfer-Metric(h5/h6)



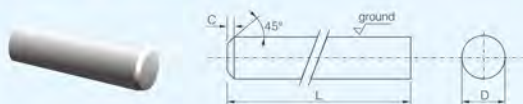
单位: mm

直径D	长度L	倒角C	直径D	长度L	倒角C
3	35	0.4	10	65	0.6
3	50	0.4	10	75	0.6
3	75	0.4	10	100	0.6
3	100	0.4	10	120	0.6
4	45	0.4	10	150	0.6
4	50	0.4	12	75	0.8
4	75	0.4	12	100	0.8
4	100	0.4	12	120	0.8
5	50	0.5	12	150	0.8
5	75	0.5	14	82	0.8
5	100	0.5	14	100	0.8
6	50	0.5	14	150	0.8
6	60	0.5	16	93	0.8
6	75	0.5	16	100	0.8
6	100	0.5	16	150	0.8
6	120	0.5	16	200	0.8
6	150	0.5	18	100	0.8
8	60	0.6	18	150	0.8
8	75	0.6	20	100	1.0
8	80	0.6	20	104	1.0
8	100	0.6	20	150	1.0
8	120	0.6	20	200	1.0
8	150	0.6	25	150	1.0

直径 Diameter		长度 Length		倒角角度 Angle of Chamfer
范围 Range (mm)	公差 Tol. (mm)	范围 Range (mm)	公差 Tol. (mm)	公差 Tol.
3.0 ≤ ΦD ≤ 25.0	h5/h6	L ≤ 200.0	+1.5 -0	+3°

» 英制精磨倒角定尺寸棒材 (h5/h6)

Ground Rods with Chamfer-Inch(h5/h6)



单位: inch

直径D	长度L	倒角C	直径D	长度L	倒角C
1/8	1-1/2	0.015	3/8	3	0.024
1/8	2	0.015	3/8	3-1/2	0.024
1/8	2-1/2	0.015	3/8	4	0.024
1/8	3	0.015	3/8	6	0.024
3/16	1-1/2	0.020	1/2	2-1/2	0.031
3/16	2	0.020	1/2	3	0.031
3/16	2-1/2	0.020	1/2	4	0.031
3/16	3	0.020	1/2	5	0.031
1/4	1-1/2	0.024	5/8	3	0.031
1/4	2	0.024	5/8	3-1/2	0.031
1/4	2-1/2	0.024	5/8	5	0.031
1/4	3	0.024	3/4	3	0.039
1/4	4	0.024	3/4	3-1/2	0.039
5/16	2	0.024	3/4	4	0.039
5/16	2-1/2	0.024	3/4	5	0.039
5/16	3	0.024	3/4	6	0.039
5/16	3-1/2	0.024	1	4	0.039
5/16	4	0.024	1	5	0.039
3/8	2	0.024	1	6	0.039
3/8	2-1/2	0.024			

直径 Diameter		长度 Length		倒角角度 Angle of Chamfer
范围Range (inchi)	公差Tol. (inchi)	范围Range (inchi)	公差Tol. (inchi)	公差Tol.
0.125 ≤ ΦD ≤ 1.000	h5/h6	L ≤ 6.0	+1/16 0	±3°

» 单直孔棒材

Unground Rods with Central Coolant Hole



单位: mm

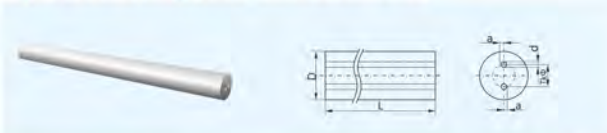
D	d	L	D	d	L
4.5	0.6		12.3	2.0	
6.0	1.0		13.0	3.0	
	1.5		14.3	2.0	
7.0	1.5			3.0	
	2.0			2.0	
8.0	1.3		16.3	2.5	
	2.5			4.0	
8.5	1.5		17.0	2.0	
	2.0		17.5	2.0	
9.0	1.0	L ≤ 330	18.0	3.0	
	1.5		18.5	3.0	L ≤ 330
	2.0		20.0	3.0	
	2.5		22.0	3.0	
	1.5		24.0	4.0	
9.5	2.0		26.0	4.0	
	2.5		28.0	4.0	
10.0	2.0		30.0	5.0	
	3.0		32.0	5.0	
10.5	1.5				
	2.0				
	2.5				

单位: mm

直径公差 Tol. D	孔径公差 Tol. d	长度公差 Tol. L
D < 5.0	+0.70 +0.30	d: 3.0 ±0.20
5.0 < D < 12.0	+1.00 +0.40	3.0 < d < 4.0 ±0.25
12.0 < D < 25.0	+1.10 +0.50	50 < L < 100 +3.5 +0
D ≥ 25.0	+1.20 +0.50	100 < L < 200 +4.5 +0
	d > 4.0 ±0.30	L > 200 +6.0 +0

» 双直孔棒材 (标准孔间距)

Unground Rods with 2 Straight Coolant Holes (Standard Bolt Circle)



单位: mm

直径 D	直径公差 Tol. D	孔位偏差 a	孔距 TK-D	孔距公差 Tol. TK-D	孔径 d	孔径公差 Tol. d	长度 L	长度公差 Tol. L
4.3			1.8		0.80			
5.3	+0.3	0.15	2.0	-0.15	0.80	±0.10		
6.4			3.0		1.00			
7.4			3.5	-0.20	1.00			
8.4	+0.3	0.20	4.0		1.00			
9.4			4.0		1.40			
10.4			5.0		1.40			
11.4			5.0		1.40	±0.15		
12.4			6.0		1.75			
13.4	+0.4		6.0	-0.30	1.75			
14.4			7.0		1.75			
15.4			7.0		2.00			
16.4			8.0		2.00			
17.4			8.0		2.00	±0.20	L≤330	+5.0 0
18.4			9.0		2.00			
19.4			9.0		2.00			
20.4		0.40	10.0		2.50			
21.4			10.0	-0.40	2.50			
22.4			11.0		2.50			
23.4	+0.5		11.0		2.50			
24.4			12.0		3.00			
25.4			12.0		3.00	±0.25		
26.4			13.0		3.00			
28.4			14.0	-0.50	3.00			
30.4			14.0		3.00			
32.4			14.0		3.00			
34.4			14.0		3.00			

» 双直孔棒材 (窄孔间距)

Unground Rods with 2 Straight Coolant Holes (Narrow Bolt Circle)



单位: mm

直径 D	直径公差 Tol. D	孔位偏差 a	孔距 TK-D	孔距公差 Tol. TK-D	孔径 d	孔径公差 Tol. d	长度 L	长度公差 Tol. L
6.4			1.5		0.80			
7.4			1.5		0.80			
8.4			2.6		1.00			
8.4	+0.3	0.20	1.5		0.80	+0.10		
8.4			2.0	-0.20	0.80			
9.4			2.6		1.00			
10.4			2.6		1.00			
11.4			3.5		1.20			
12.4			3.5		1.20			
13.4	+0.4		3.5		1.20	±0.15		
14.4			5.0		1.50			
15.3			5.0		1.50		L≤330	+5.0 0
16.4			5.0		1.50			
17.4			6.2		2.00			
18.4		0.40	6.2		2.00			
19.4			6.2		2.00			
20.4			6.2	-0.30	2.00			
21.4	+0.5		6.2		2.00	±0.20		
22.4			6.2		2.00			
23.4			7.5		2.00			
24.4			7.5		2.00			
25.4			7.5		2.00			
26.4			7.5		2.00			

» 双螺旋孔棒材 (30°)

Unground Rods with 2 Helical Coolant Holes (30°)



单位: mm

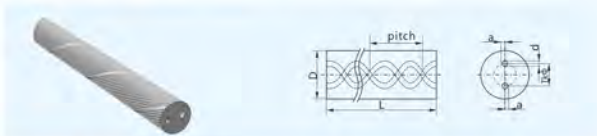
直径 D	直径公差 Tol. D	孔距 TK Φ	孔距公差 Tol. TK Φ	孔径 d	孔径公差 Tol. d	圆心偏离 a	长度 L \pm 5	螺距 Pitch
4.20	+1.0 +0.3	2.20	0 -0.4	0.60	+0.15	0.10	330	21.76
5.20	+1.1 +0.3	2.60	0 -0.4	0.70	+0.15	0.13	330	27.20
6.20	+1.1 +0.3	2.00	0 -0.4	0.70	+0.15	0.15	330	32.65
6.20	+1.1 +0.3	2.60	0 -0.4	0.70	+0.15	0.15	330	32.65
6.20	+1.1 +0.3	2.60	0 -0.4	1.00	+0.20	0.15	330	32.65
7.20	+1.1 +0.3	3.70	0 -0.4	1.00	+0.20	0.15	330	38.09
8.20	+1.2 +0.3	3.50	0 -0.4	1.00	+0.20	0.15	330	43.53
8.20	+1.2 +0.3	4.00	0 -0.4	1.00	+0.20	0.15	330	43.53
9.20	+1.2 +0.3	4.80	0 -0.6	1.40	+0.20	0.20	330	48.97
10.20	+1.2 +0.4	4.50	0 -0.6	1.40	+0.20	0.20	330	54.41
10.20	+1.2 +0.4	4.80	0 -0.6	1.40	+0.20	0.20	330	54.41
10.20	+1.2 +0.4	5.20	0 -0.6	1.40	+0.20	0.20	330	54.41
11.20	+1.2 +0.4	5.30	0 -0.8	1.40	+0.20	0.28	330	59.86
12.20	+1.2 +0.4	5.30	0 -0.8	1.40	+0.20	0.30	330	65.29

单位: mm

直径 D	直径公差 Tol. D	孔距 TK Φ	孔距公差 Tol. TK Φ	孔径 d	孔径公差 Tol. d	圆心偏离 a	长度 L \pm 5	螺距 Pitch
12.20	+1.2 +0.4	6.25	0 -0.8	1.40	\pm 0.20	0.30	330	65.29
13.20	+1.2 +0.4	6.50	0 -0.8	1.75	\pm 0.20	0.34	330	70.73
14.20	+1.3 +0.4	7.10	0 -0.8	1.75	\pm 0.20	0.37	330	76.17
14.20	+1.3 +0.4	7.10	0 -0.8	2.00	\pm 0.20	0.37	330	76.17
15.20	+1.3 +0.4	7.70	0 -0.8	1.75	\pm 0.20	0.40	330	81.61
16.20	+1.4 +0.4	8.30	0 -0.8	1.75	\pm 0.20	0.40	330	87.05
16.20	+1.4 +0.4	8.30	0 -0.8	2.00	\pm 0.20	0.40	330	87.05
17.20	+1.4 +0.4	8.90	0 -0.8	1.75	\pm 0.20	0.47	330	92.50
18.20	+1.4 +0.4	9.55	0 -0.8	2.00	\pm 0.20	0.50	330	97.94
19.20	+1.4 +0.4	10.00	0 -0.8	2.00	\pm 0.20	0.50	330	103.38
20.20	+1.4 +0.4	10.40	0 -1.0	2.00	\pm 0.20	0.50	330	108.82
21.20	+1.4 +0.4	11.15	0 -1.0	2.00	\pm 0.20	0.50	330	114.26
22.20	+1.4 +0.4	11.60	0 -1.0	2.00	\pm 0.20	0.50	330	119.70

» 双螺旋孔棒材 (40°)

Unground Rods with 2 Helical Coolant Holes (40°)

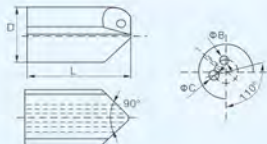


单位: mm

直径 D	直径公差 Tol. D	孔距 TK Φ	孔距公差 Tol. TK Φ	孔径 d	孔径公差 Tol. d	偏心偏差 a	长度 L \pm 5	螺距 Pitch
6.00	+1.1 +0.5	2.20	0 -0.4	0.50	\pm 0.15		330	22.46
7.00	+1.1 +0.5	2.40	0 -0.4	0.70	\pm 0.15	0.15	330	26.21
8.00	+1.1 +0.5	2.70	0 -0.6	0.70	\pm 0.15		330	29.95
9.00	+1.1 +0.5	3.20	0 -0.6	0.80	\pm 0.15		330	33.70
10.00	+1.1 +0.5	3.50	0 -0.8	0.80	\pm 0.15	0.20	330	37.44
11.00	+1.1 +0.5	3.70	0 -0.8	0.80	\pm 0.15	0.28	330	41.18
12.00	+1.1 +0.5	4.20	0 -0.8	0.90	\pm 0.20	0.30	330	44.93
13.00	+1.1 +0.5	4.40	0 -0.8	0.90	\pm 0.20	0.34	330	48.67
14.00	+1.1 +0.5	4.70	0 -0.8	1.00	\pm 0.20	0.37	330	52.42
15.00	+1.1 +0.5	5.10	0 -0.8	1.10	\pm 0.20	0.40	330	56.16
16.00	+1.2 +0.5	5.50	0 -0.8	1.20	\pm 0.20		330	59.90
17.00	+1.2 +0.5	5.90	0 -0.8	1.20	\pm 0.25	0.47	330	63.65
18.00	+1.2 +0.5	6.30	0 -0.8	1.40	\pm 0.25		330	67.39
19.00	+1.2 +0.5	6.70	0 -0.8	1.40	\pm 0.25	0.50	330	71.14
20.00	+1.2 +0.5	7.10	0 -1.0	1.50	\pm 0.25		330	74.88

» 深孔钻头料

Blanks of Deep Hole Drill Bit



单位: mm

型号 Type	直径 D	直径公差 Tol. D	φB	公差 Tol. φB	φC	公差 Tol. φC	长度 L	长度公差 Tol. L
QSφ10.5R0*36	10.5		1.9		2.3		36.0	
QSφ11.0R0*38	11.0		2.0		2.4		38.0	
QSφ11.5R0*38	11.5		2.0		2.4		38.0	
QSφ12.0R0*40	12.0		2.2		2.5		40.0	
QSφ12.5R0*40	12.5		2.2		2.5		40.0	
QSφ13.0R0*40	13.0		2.4		2.7		40.0	
QSφ13.5R0*40	13.5		2.4		2.7		40.0	
QSφ14.0R0*40	14.0	+0.50 -0.10	2.5	±0.20	2.8	±0.20	40.0	+3.0 +0.0
QSφ14.5R0*40	14.5		2.5		2.8		40.0	
QSφ15.0R0*42	15.0		2.4		3.3		42.0	
QSφ15.5R0*42	15.5		2.8		3.3		42.0	
QSφ16.0R0*45	16.0		2.5		3.5		45.0	
QSφ16.5R0*45	16.5		3.0		3.5		45.0	
QSφ17.0R0*45	17.0		2.6		3.7		45.0	
QSφ17.5R0*45	17.5		2.6		3.7		45.0	

单位: mm

型号 Type	直径 D	直径公差 Tol. D	φB	公差 Tol. φB	φC	公差 Tol. φC	长度 L	长度公差 Tol. L
QSφ18.0R0*51	18.0		3.2		3.9		51.0	
QSφ19.0R0*51	19.0		3.2		3.9		51.0	
QSφ20.0R0*55	20.0		3.5		4.2		55.0	
QSφ21.0R0*55	21.0		3.5		4.2		55.0	
QSφ22.0R0*58	22.0		3.5		4.5		58.0	
QSφ23.0R0*58	23.0		3.5		4.5		58.0	
QSφ24.0R0*58	24.0		4.0		5.0		58.0	
QSφ25.0R0*61	25.0		4.0		5.0		61.0	
QSφ26.0R0*61	26.0		4.0		5.0		61.0	
QSφ27.0R0*61	27.0		4.5		5.5		61.0	
QSφ28.0R0*63	28.0		4.5		5.5		63.0	
QSφ29.0R0*63	29.0	+1.5 +0.5	4.5	±0.35	5.5	±0.35	63.0	+3.0 +0.0
QSφ30.0R0*65	30.0		5.0		6.0		65.0	
QSφ31.0R0*65	31.0		5.0		6.0		65.0	
QSφ32.0R0*65	32.0		5.0		6.0		65.0	
QSφ33.0R0*65	33.0		5.0		6.0		65.0	
QSφ34.0R0*65	34.0		5.5		6.5		65.0	
QSφ35.0R0*65	35.0		5.5		6.5		65.0	
QSφ36.0R0*65	36.0		6.0		7.0		65.0	
QSφ37.0R0*65	37.0		6.0		7.0		65.0	
QSφ38.0R0*65	38.0		6.0		7.0		65.0	
QSφ39.0R0*65	39.0		6.5		7.5		65.0	
QSφ40.0R0*65	40.0		6.5		7.5		65.0	

» 肾型孔枪钻钻头

Gun Drill Bits with Kidney-Shaped Hole



单位: mm

型号 Type	D +0.4 -0.1	RA = 0.15	B ± 0.20	L +3.0 +0
QYΦ4.5R0°32	4.5	1.1	0.7	
QYΦ5.5R0°32	5.5	1.3	0.8	32
QYΦ6.3R0°32	6.3	1.6	0.9	
QYΦ6.9R0°32	6.9	1.7	1.2	
QYΦ7.6R0°34	7.6	1.7	1.2	34
QYΦ8.0R0°34	8.0	1.8	1.3	
QYΦ8.6R0°36	8.6	1.9	1.3	
QYΦ9.0R0°36	9.0	2.0	1.4	36
QYΦ9.7R0°36	9.7	2.2	1.4	
QYΦ10.5R0°36	10.5	3.2	2.4	

» 挤压板条产品

Cemented Carbide Bars



单位: mm

宽度 W	厚度 T	长度 L	宽度 W	厚度 T	长度 L
1.0	1.0-5.0		11.0		
1.5	1.5-6.0		11.5		
2.0			12.0		
2.5	2.0-25.0		12.5		
3.0			13.0		
3.5			13.5		
4.0			14.0		
4.5			14.5		
5.0	4.0-30.0		15.0		
5.5		≤330	15.5	7.0-30.0	≤330
6.0			16.0		
6.5			16.5		
7.0			17.0		
7.5			17.5		
8.0			18.0		
8.5	7.0-30.0		18.5		
9.0			19.0		
9.5			19.5		
10.0			20.0		
10.5					

» 非常规材料/形状产品 Special Products



» 附录 Appendix

» 硬质合金常用名词解释

Physical and Mechanical Properties of Cemented Carbide

☆ 密度

硬质合金的密度(比重)是合金质量与其体积之比,采用阿基米德排水法进行测量 (ISO3369)。

硬质合金的密度通常用于确定牌号的主要成分,对于WC-Co系列硬质合金而言,合金密度随着钴含量的增加而减少。

☆ 硬度

硬质合金的硬度是指合金抵抗金刚石压头压入表面的能力,主要采用洛氏硬度 (HRA) 或维氏硬度 (HV) 来表示 (ISO3738/ISO3878)。

洛氏硬度 (HRA) 或维氏硬度 (HV) 测量的原理不同,两种硬度的转换需特别注意。

☆ 抗弯强度

硬质合金的抗弯强度是指合金抵抗弯曲断裂的能力,即合金标准试样在规定跨距的中点加载负荷至断裂时单位面积上所承受的力的大小 (ISO3327)。

硬质合金的抗弯强度随试样的形状、表面状态及检测设备不同,检测值会有很大变化。

硬质合金的抗弯强度只适合作为牌号选择的参考。

☆ Density

The density (specific gravity) of a cemented carbide is the ratio of the mass of the alloy to its volume, measured by the Archimedes drainage method (ISO3369) / Water Displacement Technique. The density of cemented carbide is generally used to determine the main components of the grade. For WC-Co grades of cemented carbide, the alloy density decreases in a linear correlation with the increase in cobalt content.

☆ Hardness

The hardness of cemented carbide material refers to the capacity of the alloy to resist the indentation of the diamond indenter into the surface of an object and is measured mainly using the Rockwell (HRA) and Vickers (HV) (ISO3738 OR ISO3878). The measurement methodologies of the Vickers and Rockwell tests differ from each other; therefore, special attention must be paid when converting from one system to another.

☆ TRS

The Transverse Rupture Stress (TRS) refers to the mechanical strength of the carbide material to resist bending or fracturing, measured at the breaking point of a material in a standard three point bend test.

» 国际标准 (ISO) 硬质合金成分性能分类
ISO Standard (Classified by Compositions)

ISO	美国工业分类号 (USA)	WC	TiC	TaC(NbC)	Co	Ni	Mo	密度 Density (g/cm ³)	硬度 Hardness (HV)	抗弯强度 TRS (N/mm ²)
P01	C8	—	80	—	—	10	10	5.8	1900	850
P01	C8	50	35	7	6	—	—	8.5	1900	1100
P05	C7	78	16	—	6	—	—	11.4	1820	1300
P10	C7	69	15	8	8	—	—	11.5	1740	1400
P15	C6	78	12	3	7	—	—	11.7	1660	1500
P20	C6	79	8	5	8	—	—	12.1	1580	1600
P25	C6	82	6	4	8	—	—	12.9	1530	1700
P30	C5	84	5	2	9	—	—	13.3	1490	1850
P40	C5	85	5	—	10	—	—	13.4	1420	1950
P50	—	78	3	3	16	—	—	13.1	1250	2300
M10	—	85	5	4	6	—	—	13.4	1590	1800
M20	—	82	5	5	8	—	—	13.3	1540	1900
M30	—	86	4	—	10	—	—	13.6	1440	2000
M40	—	84	4	2	10	—	—	14.0	1380	2100
K01	C4	97	—	—	3	—	—	15.2	1850	1450
K05	C4	95	—	1	4	—	—	15.0	1780	1550
K10	C3	92	—	2	6	—	—	14.9	1730	1700
K20	C2	94	—	—	6	—	—	14.8	1650	1950
K30	C1	91	—	—	9	—	—	14.4	1400	2250
K40	C1	89	—	—	11	—	—	14.1	1320	2500

» 国际标准 (ISO) 硬质合金的用途
ISO Standards (Classified by Applications)

主要排屑类别 Sort of chips removal		使用类别 Application		性能提高方向 Performance advanced	
合金类别 Sort of alloy	机械加工材料大类 Suitable for machining (general)	ISO应用 分类号/应用	机械加工材料 Suitable for machining	合金性能 Alloy physical property	切削性能 Cutting performance
P	长切屑的黑色金属 Black metal with long chips	P01	钢, 铸钢件 steel and steel casting	↑ 耐 磨 性 ↓ ↑ 切 削 速 度 ↓ ↑ 切 削 性 能 ↓ ↑ 进 给 量 ↓	↑ 切 削 速 度 ↓ ↑ 切 削 性 能 ↓ ↑ 进 给 量 ↓
		P10	钢, 铸钢件 steel and steel casting		
		P20	钢, 铸钢件, 长切屑的可锻铸铁 steel, steel casting and malleable cast iron with long chips		
		P30	钢, 铸钢件, 长切屑的可锻铸铁 steel, steel casting and malleable cast iron with long chips		
		P40	钢, 有色合金和铝基的铸钢件 steel, steel casting iron with alloy and grit		
M	长或短切屑的黑色金属; 有色金属 Black metal with long and short chips, nonferrous metal	P50	钢, 有色合金和铝基的铸钢件 steel, low to medium strength of aluminum steel casting iron with alloy and grit	↑ 耐 磨 性 ↓ ↑ 切 削 速 度 ↓ ↑ 切 削 性 能 ↓ ↑ 进 给 量 ↓	↑ 切 削 速 度 ↓ ↑ 切 削 性 能 ↓ ↑ 进 给 量 ↓
		M10	钢, 铸钢件, 铸钢, 灰口铸铁, 合金铸铁 steel, steel casting, iron/aluminum alloy, grey cast iron and cast alloy iron		
		M20	钢, 铸钢件, 奥氏体不锈钢, 灰口铸铁 steel, steel casting, austenitic steel or iron/aluminum alloy and grey cast iron		
		M30	钢, 铸钢件, 奥氏体不锈钢, 灰口铸铁, 超硬合金 steel, steel casting, austenitic steel, grey cast iron and high temperature resistance alloy		
K	短切屑的黑色金属, 有色金属, 非金属材料 Black metal with short chips, nonferrous metal and non-metallic materials	M40	高速切削碳钢, 低合金钢, 有色金属和钛合金 free-cutting soft steel, low strength of aluminum alloy, titanium alloy and light alloy	↑ 耐 磨 性 ↓ ↑ 切 削 速 度 ↓ ↑ 切 削 性 能 ↓ ↑ 进 给 量 ↓	↑ 切 削 速 度 ↓ ↑ 切 削 性 能 ↓ ↑ 进 给 量 ↓
		K10	非排屑的灰口铸铁, 冷硬铸铁, 高硅铝合金, 淬火钢, 磨料 grey cast iron with high hardness, chilled cast iron, high silicon aluminum alloy, quenched steel, high temperature alloy, hard superalloy and ceramic		
		K20	布氏硬度≥220以上的灰口铸铁, 有色金属, 非金属材料 grey cast iron of Brinell hardness(HV)≥220, nonferrous metal, ceramic alloy and aluminum		
		K30	低硬度的灰口铸铁, 低合金钢, 铸钢, 压缩木材 low Brinell hardness grey cast iron, low strength of aluminum alloy and compressed wood		
K40	软木或胶木, 有色金属 soft and hard wood, nonferrous metal				





“长城”从这里向世界延伸
 “GREAT WALL” IS EXTENDING FROM HERE TO THE WORLD

