



硬质合金 金刚石砂轮 机械加工/模具制造  
Cemented carbide Diamond abrasives Further machining / Mold manufacture



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## 企业简介 Company profile

株洲市超宇实业有限责任公司位于中国硬质合金之都—湖南省株洲市，成立于1998年6月，是一家科技型的生产企业。公司不仅拥有一支年轻、团结、锐意进取、崇尚科学的领导团队，还拥有一大批奉技术为企业生命的科研人才和奉质量为企业根基的操作能手，旨在通过不断充实企业生产力，打造不折不扣的“超宇”品牌。

公司下设三个分厂：硬质合金分厂、金刚石/CBN砂轮分厂、机械深加工分厂。2006年公司成功注册认证“超宇”牌商标；2010年顺利通过ISO9001:2008质量管理体系认证。公司生产的“超宇”牌硬质合金、金刚石/CBN砂轮等产品畅销全国，远销到东南亚、南美和欧盟部分国家和地区，受到广大客户的青睐。

公司坚持贯彻“专业制造 质量第一 不断创新 精益求精”的质量方针，严格按GB/T19001—ISO9001国际质量标准建立质量管理体系，从严控制生产工艺和产品质量，为顾客提供优质的产品，以顾客需求为目标，努力开发新产品，满足不断变化的市场需求。

公司成立以来，始终奉行“顾客至上 诚信为本 至善服务 互利双赢”的经营理念，不断加大技术投入，创新经营管理，扩大超宇品牌的影响力，大力拓展市场空间。由小到大，由弱变强，逐步发展成为株洲市硬质合金、超硬材料生产规模企业，先后多次荣获省市各类荣誉。公司全力朝着做强企业，持续发展的战略目标迈进。

Located in Zhuzhou city, the largest carbide base in China, Zhuzhou Chaoyu Industrial Co., Ltd has been focusing on research, manufacture, and development of tungsten carbide and diamond abrasive tools since established in 1998. Now we have more than 20 professional engineers and 140 staffs who work on three branches: tungsten carbide department, diamond abrasive tools department, further machining department.

Chaoyu brand is recognized by our customer worldwide as a trusted and reliable partner that delivers top quality products and services, smart management and cost-effective production techniques make us the partner of choice for extra-hard materials. With ISO9001:2000 certification, we've been always trying to improve the technology through strict standard facility system and experienced team members, and been stably supplying our "CHAOYU" brand carbide rods/plates/sealing rings/rollers and diamond grinding wheels to hundreds of clients in domestic and international market.

"Quality First, Client Oriented, Warm Service, Constant Innovation and Keep Improving" is our continuous spirit, your visit to our plant and specific inquiry will be more than welcome.





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## 机械加工/模具生产 Further machining /Mold manufacture



## ■ 硬质合金牌号、性能及推荐用途

### Cemented carbide grade and applications

牌号 Grade	物理机械性能 Physical and mechanical properties			推荐用途 Applications recommended
	密度 Density g/cm <sup>3</sup>	抗弯强度 TRS N/mm <sup>2</sup>	硬度 Hardness (HRA)	
YF10	14.80-15.10	≥1880	≥92.5	适于铸铁、有色金属及低合金钢的半精加工以及石墨刹车片方面的新型材料加工。 Used for semi-machining of cast iron, nonferrous metals and low alloy steel, machining of various new material, such as graphite brake pads.
YF10.1	14.80-15.15	≥1980	≥92.0	有较高的硬度和耐磨性, 适用于高速拉丝模, 竹木刀具, 棒材, 耐磨件等。 Higher hardness and wear resistance, mainly used for high speed wire drawing dies, woodworking inserts, rods, bars, and various special wear-resistant parts.
YF10.2	14.30-14.16	≥2650	≥91.8	有很高的综合性能, 广泛用于电子, 金属, 木工, 竹子等行业的刀具。也可用于高性能耐磨件领域。 Excellent combination property, widely used for inserts of metal machining, woodworking industry and higher performance wear-resistant field.
YF10.3	14.80-15.05	≥2200	≥91.8	有较高的硬度和强度, 适用于加工纤维板等行业的刀具。 Higher hardness and compressive strength, rightly used for inserts to machine fibreboard field.
YL80	13.75-14.05	≥3200	≥89.5	有很高的硬度和韧性, 适用于生产电子行业引线框架、各类薄片、引线框架、马达定子、转子、弹簧片、矽钢片等冲压模具, 及剃须刀片冲压模具。 Higher hardness and T.R.S, rightly used for punching mold of electronic lead frame, engine stator and rotor, springs, coiled silicon steel sheet and razor blade.
YL80.1	14.70-14.90	≥2550	≥90.5	有较高的耐磨性, 用于粉末冶金模具、耐磨件、密封环及可加工成钻头、铣刀等。 Higher wear resistance, widely used for powder metallurgy dies, wear-resistant parts, sealing rings. Also solid blanks for various drills, end mills, etc.
YL80.2	14.00-14.20	≥2800	≥87.5	适用于制作冲压凹模、凸模、电子级进模; 矽钢片, 冷轧板冲压模具, 适合制作拉制模具、耐磨零件及冲压配件和硬质合金自动压力机用模芯等 Widely used for manufacturing concave and convex punching dies, electronics grade wire threading dies, punching dies to machine silicon steel plate and cold-rolled sheet, various wire drawing dies, wear-resistant parts and punching mold accessories and mold for automatic press machine of tungsten carbide field.

## ■ 硬质合金牌号、性能及推荐用途

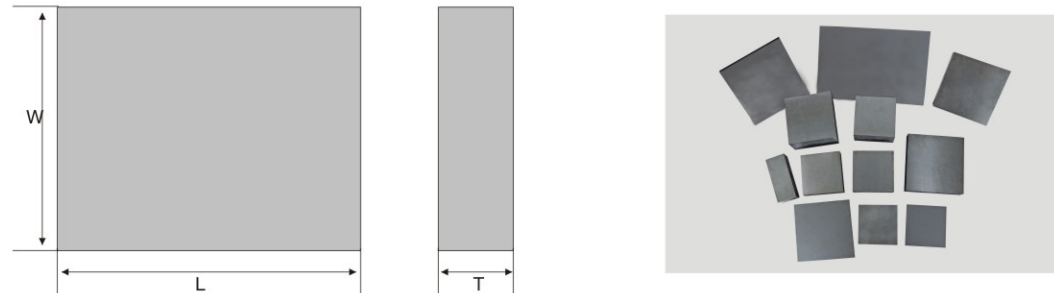
### Cemented carbide grade and applications

牌号 Grade	物理机械性能 Physical and mechanical properties			推荐用途 Applications recommended
	密度 Density g/cm <sup>3</sup>	抗弯强度 TRS N/mm <sup>2</sup>	硬度 Hardness (HRA)	
YL80.3	13.50-13.80	≥2750	≥85.0	适于生产在较大应力下冲压模具用板材。 Used for plates and strips which is applied under high pressure.
YL80.4	13.70-14.00	≥2850	≥86.0	具有较高的强韧性, 适用于形状复杂的模具、如齿轮模, 制作变压器用矽钢片圆剪辊剪刀。 Higher T.R.S, rightly used for complex molds, such as gear die, coiled silicon steel sheet and roller shear of transformer.
YL80.5	14.20-14.50	≥2750	≥88.0	具有较高的硬度, 适用于矽钢片矽钢片直剪刀具及铜片冲压等。 Higher hardness, used for inserts to machine silicon steel sheet and punching dies to machine copper sheet.
YL90	13.50-13.70	≥2500	≥83.0	具有较高的强度和抗疲劳韧性, 适于制作大规格缩颈模、六片模, 螺母模下仁。 Higher compressive strength and T.R.S, widely used for large dimension necking-down moulds, Hexagonal combination moulds, bottom part of nut moulds, etc.
YL90.1	13.90-14.10	≥2340	≥84.5	有较高的耐磨性和韧性, 适于制作一般耐冲击锻造模, 冷冲模具和螺母模上仁。 Higher wear resistance and T.R.S, widely used for general cold forging mould, punching moulds, and top part of nut moulds, etc.
YL90.2	13.40-13.90	≥2400	≥83.5	适于中规格螺栓缩颈模和螺母模上仁。 Widely used for medium dimension necking-down moulds and top part of nut moulds, etc.
YL90.4	13.20-13.40	≥2600	≥82.0	具有很高的强度和抗疲劳韧性, 用于螺母模下仁、全钨一冲等有较大冲击力的冷墩、冷冲、冷压模具。 High compressive strength and T.R.S, rightly used for bottom part of nut dies, cold forging die, cold punching dies, cold stamping dies.
YL90L	13.20-13.40	≥2450	≥82.0	用于一般冷冲螺丝模具和切断刀片。 Widely used for cold punching screw moulds and shear blade.



## ■ 硬质合金板材

### Cemented carbide plates



推荐牌号: YL80 YL80.1 YL80.2 YL80.3 YG8 YG15 YG20

- 主要适用于电子行业、半导体行业的接插件和马达转子、定子、EI硅钢片的精密高速冲孔。
- 产品性能稳定, 质量可靠。
- 压制模具规格齐全, 工艺成熟, 设备先进。
- 精坯、毛坯均能供应。

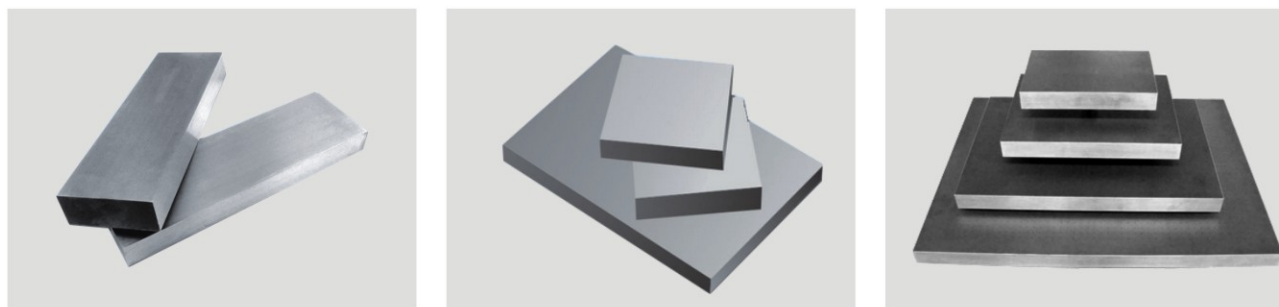
Recommended quality grade :

- Mainly used for wear-resistant parts of electronic and semi-conductor field, high precision punching of engine stators, engine rotors, and EI silicon steel sheet.
- Stable property, credible quality.
- Complete range of specification with mature procedure and improved facilities.
- Blank and well finished plates are both available here.

基本尺寸 ( mm ) Dimension			基本尺寸 ( mm ) Dimension		
L	W	T	L	W	T
50	50	100	150	150	2-60
80	80	110	180	180	2-60
100	100	150	200	200	2-60
105	105	200	250	250	2-35
120	120		300	300	2-40
125	125		324	133	2-30

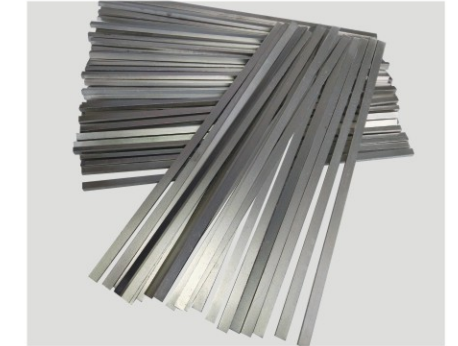
注: 以上为常用规格, 我公司也可根据用户提供图样或者尺寸生产其它规格!

Remark: We could produce as your drawing and special specification.



## ■ 硬质合金长条薄片

### Cemented carbide bars



推荐牌号: YF10 YF10.1 YF10.2 YG8 YG15 YG20

适用范围: 适用于制作木工刀具中的成型刀、铰孔刀、锯齿刀、牙签刀以及各类异型刀具、耐磨件。

我们能根据客户需要加工各种规格型号的长条。请提供以下数据:

- 1 牌号
- 2 尺寸要求
- 3 尺寸公差
- 4 表面要求等。

recommended quality grade : YF10 YF10.1 YF10.2 YG8 YG15 YG20

application field: forming woodworking inserts, reaming inserts, saw blades, various wear-resistant parts and special carbide inserts. OEM is more than welcome here, we could produce as your specific grade, dimension, tolerance and roughness request.

W(mm)	T(mm)	L(mm)	W(mm)	T(mm)	L(mm)
4	1.2 ~ 10	10 ~ 330	18	1.2 ~ 10	10 ~ 330
5	1.2 ~ 10	10 ~ 330	20	1.2 ~ 10	10 ~ 330
6	1.2 ~ 10	10 ~ 330	22	1.2 ~ 10	10 ~ 330
7	1.2 ~ 10	10 ~ 330	25	1.2 ~ 10	10 ~ 330
8	1.2 ~ 10	10 ~ 330	28	1.2 ~ 10	10 ~ 330
9	1.2 ~ 10	10 ~ 330	30	1.2 ~ 10	10 ~ 330
10	1.2 ~ 10	10 ~ 330	32	1.2 ~ 10	10 ~ 330
11	1.2 ~ 10	10 ~ 330	35	1.2 ~ 10	10 ~ 330
12	1.2 ~ 10	10 ~ 330	38	1.2 ~ 10	10 ~ 330
13	1.2 ~ 10	10 ~ 330	40	1.2 ~ 10	10 ~ 330
14	1.2 ~ 10	10 ~ 330	50	1.2 ~ 10	10 ~ 330
15	1.2 ~ 10	10 ~ 330	70	1.2 ~ 10	10 ~ 330
16	1.2 ~ 10	10 ~ 330	80	1.2 ~ 10	10 ~ 330
17	1.2 ~ 10	10 ~ 330	100	1.2 ~ 10	10 ~ 330



## ■ 硬质合金冲压冷墩模

### Cemented carbide dies

冷墩、冷冲模具/Tungsten carbide cylindrical dies

规格/Specification :

外径Outer dia:  $\Phi 3 - \Phi 200\text{mm}$

内孔Inner bore:  $\Phi 0.5 - \Phi 180\text{mm}$

高Height: 2-150mm (semi-finish machining & HIP sintered)

冷墩冷冲模主要用于螺栓、螺母、异型件的制造

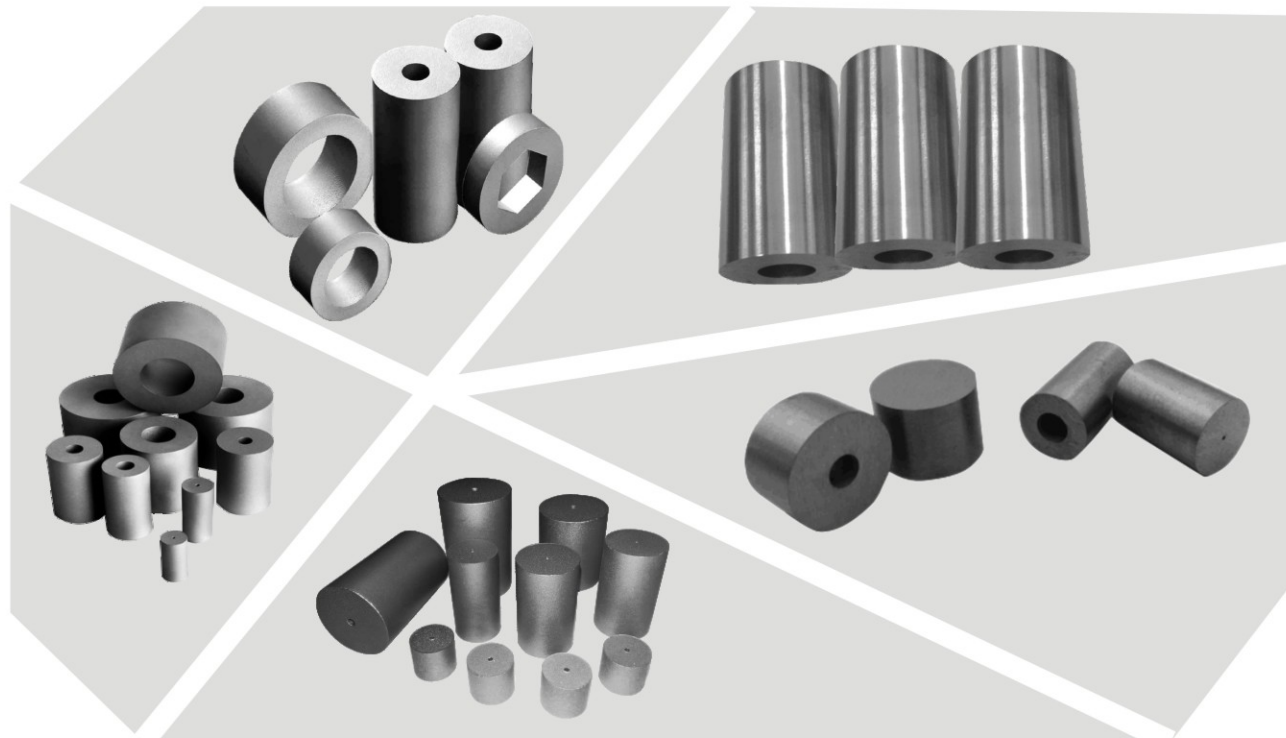
硬质合金是用粉末冶金方法制造的复合材料,其硬度很高、耐磨性好,用于制作冷墩模具,其使用寿命可提高数倍和数百倍。

我公司可根据客户需要进行定制生产各类型号规格的产品。

Semi-finish machining makes various standard and special cold forging and punching dies available in our factory, all items are sintered by HIP furnace and widely used in metal industry, such as fasteners and special accessories.

Tungsten carbide is composite material with high hardness and wear resistance produced through powder metallurgy, whose service life is decuple even hundreds of times than that of steel dies.

Customized products are more than welcome as your special specification and tolerance.



## ■ 硬质合金棒材类

### Cemented carbide rods



硬质合金圆棒推荐牌号: YG6, YG8, YG6X, YL80, YL80.1, YL80.2, YF10, YF10.2 等

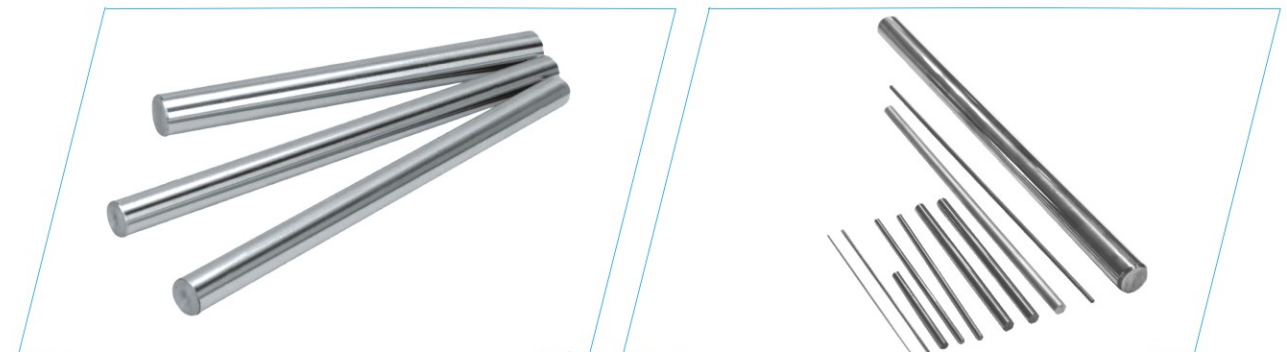
主要用途: 硬质合金棒可用于加工制作铰刀、钻头、铣刀、摇杆、镗刀、沉头铣刀、枪钻, 雕刻用钻头等等。

我公司为顾客提供各类优质硬质合金圆棒: 圆棒毛坯, 无孔毛坯和精加工圆棒。同时我公司还能为客户提供带一个孔, 两个或者三个以上孔的棒材。我公司能提供长度为2-330mm长度范围, 直径 $\Phi 0.4 - \Phi 330\text{mm}$ 范围的圆棒。同时也可以根据客户的要求定制生产。

Recommended quality grade : YG6, YG8, YG6X, YL80, YL80.1, YL80.2, YF10, YF10.2 etc

Main application: Blank rods are widely used to produce shock-resistant turning tool bar, milling tool bar, reamer, drill bit, end mill, rocker, boring cutter, countersink, gun driller, graver bit, etc.

We supply solid carbide rods, carbide rods with ducts and well machined carbide rods with outer diameter from 0.4mm to 330mm, length from 2mm to 330mm. And we also could produce as your special specification.





## ■ 硬质合金轧辊类

### Cemented carbide roller rings

硬质合金轧辊采用高硬度，高光洁度，高耐磨性的硬质合金作为工作面。硬质合金加以镜面抛光，保证了压出的片材光滑漂亮，尺寸精确。在挤压不锈钢网，五金线材压片，金银压片压线等广泛使用。异型金属丝用碳化钨轧辊。主要用于高精度、高光洁度，各类黑色、有色、稀有金属丝棒材的轧制。

可根据客户要求定制各种压线轮。

Tungsten carbide rolls are widely used in production of stainless steel mesh, hardware sheet, gold and silver wires and sheet, etc, its high precision mirror polished working surface with high hardness, fine finish and high wear resistance makes the machined items smooth and precise with good look. Some special rolls are mainly applied in metal industry, and used for rolling of ferrous metals, nonferrous metals and rare metals, which has higher request on precision and roughness.

Various wires and rods guiding rolls are available with your special request.



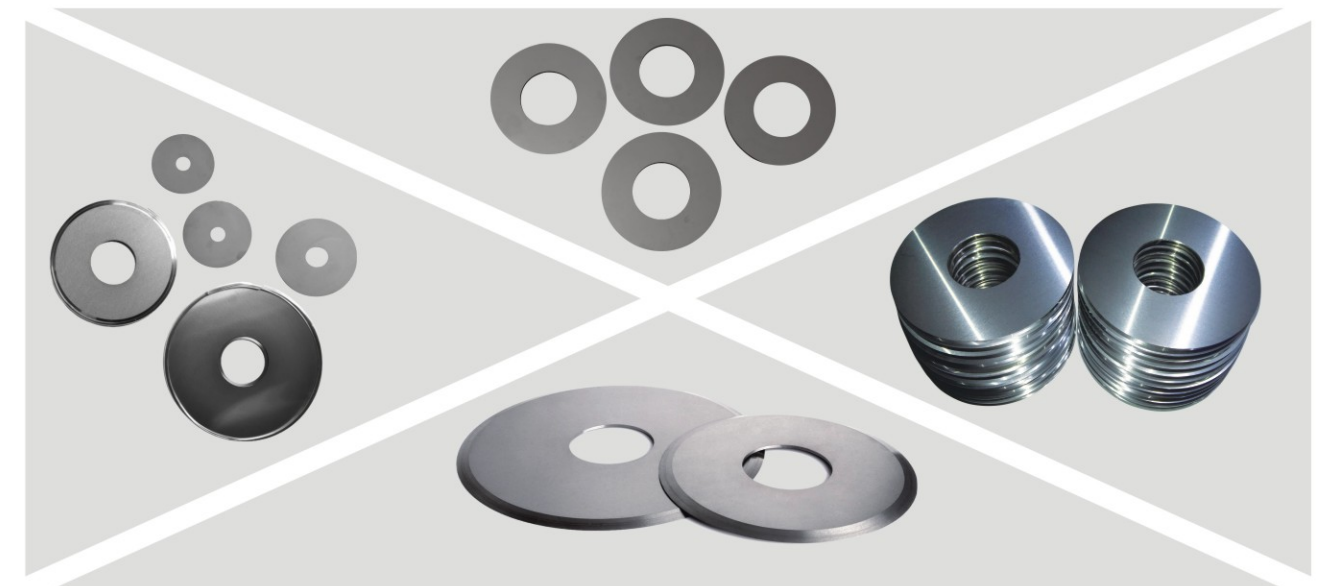
## ■ 硬质合金分条刀

### Cemented carbide cutting discs

硬质合金分切刀片，硬度高、耐磨性好，使用寿命长。采用高精度磨床精磨刃口，加工精度高，光洁度达到镜面效果，刃口锋利，被切割截面平整，光滑无毛刺。用于塑料、胶带、瓦楞纸、包装纸箱、薄膜、金、银箔、铜箔、铝箔、磁带等物品的分割切割的分切刀具。

With high hardness, superior wear resistance, mirror polished surface, high precision and fine finished sharp cutting edge, Tungsten carbide cutting discs has its excellent performance on cutting of plastic material, adhesive tapes, corrugated boards, paper boards, thin films, metal foils and other materials with long service life.

Φ 50* $\phi$ 18*8	Φ 104* $\phi$ 11.5*11.5	Φ 150* $\phi$ 90*20
Φ 50* $\phi$ 25*2.4	Φ 117* $\phi$ 45*5	Φ 150* $\phi$ 95*20
Φ 52* $\phi$ 24*2.5	Φ 117* $\phi$ 70*5	Φ 167* $\phi$ 105*8
Φ 61* $\phi$ 12*1.5	Φ 120.4* $\phi$ 80*5	Φ 195* $\phi$ 125*15
Φ 61* $\phi$ 23*15	Φ 125* $\phi$ 10*5	Φ 195* $\phi$ 150*15
Φ 65* $\phi$ 27*9	Φ 125* $\phi$ 45*5	Φ 202* $\phi$ 160*11
Φ 67.3* $\phi$ 34*10	Φ 125* $\phi$ 60*5	Φ 204* $\phi$ 158*11
Φ 70* $\phi$ 32*15	Φ 130* $\phi$ 50*25	Φ 208* $\phi$ 132*8
Φ 71* $\phi$ 44*6.8	Φ 130* $\phi$ 60*25	Φ 210* $\phi$ 85*15
Φ 75* $\phi$ 40*10	Φ 130* $\phi$ 80*25	Φ 210* $\phi$ 88*5
Φ 80* $\phi$ 20*4.5	Φ 130* $\phi$ 85.9*25	Φ 230* $\phi$ 120*6
Φ 100* $\phi$ 64*5	Φ 130* $\phi$ 88*1.5	Φ 250* $\phi$ 140*20



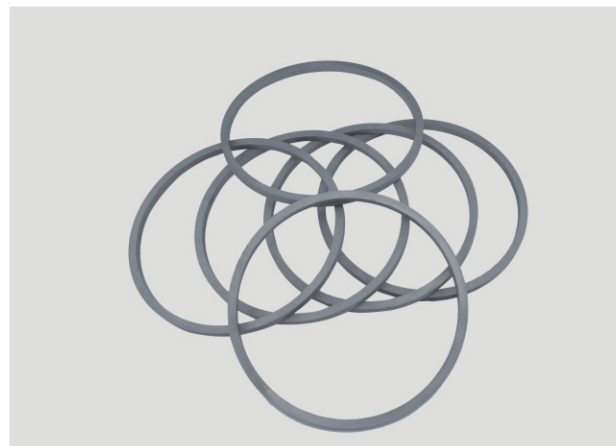


## ■ 硬质合金圆环/密封环

### Cemented carbide sealing rings

硬质合金密封环被广泛的用作机械密封件，例如炼油行业、石油化工厂、化肥机械制造行业、以及药物制药行业的泵、压缩机和搅拌机中。机械密封环经过不断的发展能耐高温，耐高压，同时能耐高浓度的化学腐蚀物。我公司能制作各类形状的密封环比如说平行环、DA型、T型、L型等。同时也能根据客户要求定制生产各类密封环。

After several years' research and improvement, we mainly supply tungsten carbide mechanical sealing rings which conform to ISO, ANSI, API standard with high heat resistance, high pressure resistance, and excellent corrosion resistance, tungsten carbide mechanical sealing rings are widely used in petrochemical, electric power, steel, pharmacy, paper making, ship building and other industrial field.



## ■ 硬质合金喷嘴

### Cemented carbide nozzles

#### 特性 Advantages:

1. 硬质合金喷嘴采用超细颗粒碳化钨，添加抗磨、耐腐蚀微量元素，抗弯强度达到3000 N/mm<sup>2</sup>以上，具有硬度高、耐腐蚀、使用寿命长、性价比高等优点。
  2. 硬质合金喷嘴被广泛应用于表面处理，喷砂，喷漆，石油、电子，化工，环保（脱硫、脱硝、脱氮、除尘等），食品喷嘴等行业。
1. Ultrafine particles are usually used for tungsten carbide nozzles, hard-wearing and erosion-resisting trace element added, which make its T.R.S more than 3000 N/mm<sup>2</sup> with excellent erosion resistance, long service life and high cost performance.
  2. Tungsten carbide nozzles are widely used for surface treatment, sand blasting, paint, petroleum, electronics, chemistry, environmental protection fields (desulfuration, denitration, denitrification, dedusting, etc), food nozzles, etc.





## ■ 横剪切刀具产品

### Cemented carbide inserts

横剪切刀具产品企业标准

Quality standard of transverse cutting inserts

横剪切刀具 Transverse cutting inserts	工作面平行度 end-side parallelism	长度 < 750mm Length < 750mm	<0.005mm
		长度 > 800mm Length > 800mm	≤0.01mm
	工作面垂直度 end-face perpendicularity		<0.01 mm
	角度公差 Angle tolerance		< 2°
	表面粗糙度 Surface roughness		Ra=0.2
	刀片连接无缝痕 Blades connect up seamlessly	承诺： 1、在正常操作使用情况下，每刃磨一次剪切0.2-0.5mm硅钢片料可达到100-150万次，毛利≤0.02mm  Quality assurance: 1. It could get 100-150 million times' machining to 0.2-0.5mm silicon steel sheet with right operation, damage and burs are controlled within 0.02mm	

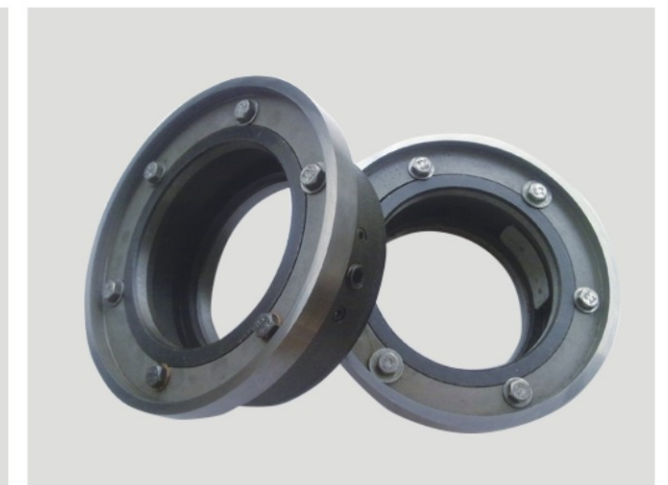
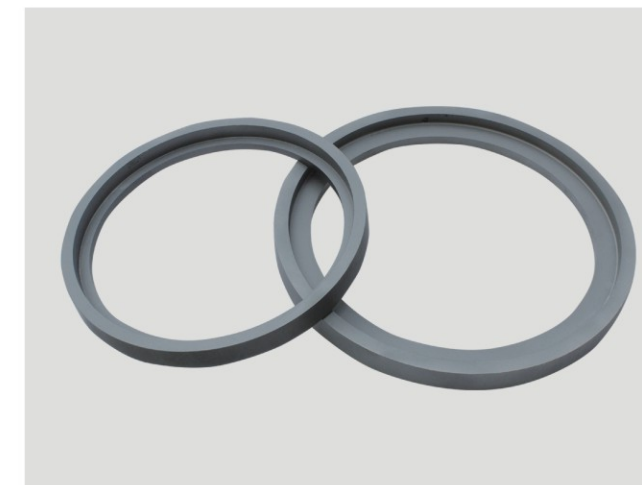
## ■ 滚剪刀具产品

### Cemented carbide inserts

滚剪刀具产品企业标准

Quality standard of roll cutting inserts

纵滚剪 切刀具 Roll cutting inserts	径向跳动 radial run-out	<0.01mm
	端面跳动 end-face run-out	≤0.01mm
	内孔公差 Inner bore tolerance	Ha
	表面粗糙度 Surface roughness	Ra=0.2
	承诺： 1、三点结构式纵剪刀具，在正常操作适应情况下，每刃磨一次剪切0.2-0.35mm硅钢片料可达到6-9万米以上，毛利≤0.02mm 2、自动锁扣式纵剪刀具，在正常操作使用情况下，每刃磨一次剪切0.2-0.35mm硅钢片料可达到23-28万米以上，毛利≤0.02mm  Quality assurance: 1. Three-point structured blades could get 60,000-90,000 meters machining to 0.2-0.35mm silicon steel sheet with right operation, damage and burs are controlled within 0.02mm. 2. 230,000-280,000 meters of 0.2-0.35mm silicon steel sheet could be finished by automatic lock catch type blades in proper correct way, once for each of the cutting edges.	





■ 硬质合金产品

Cemented carbide products

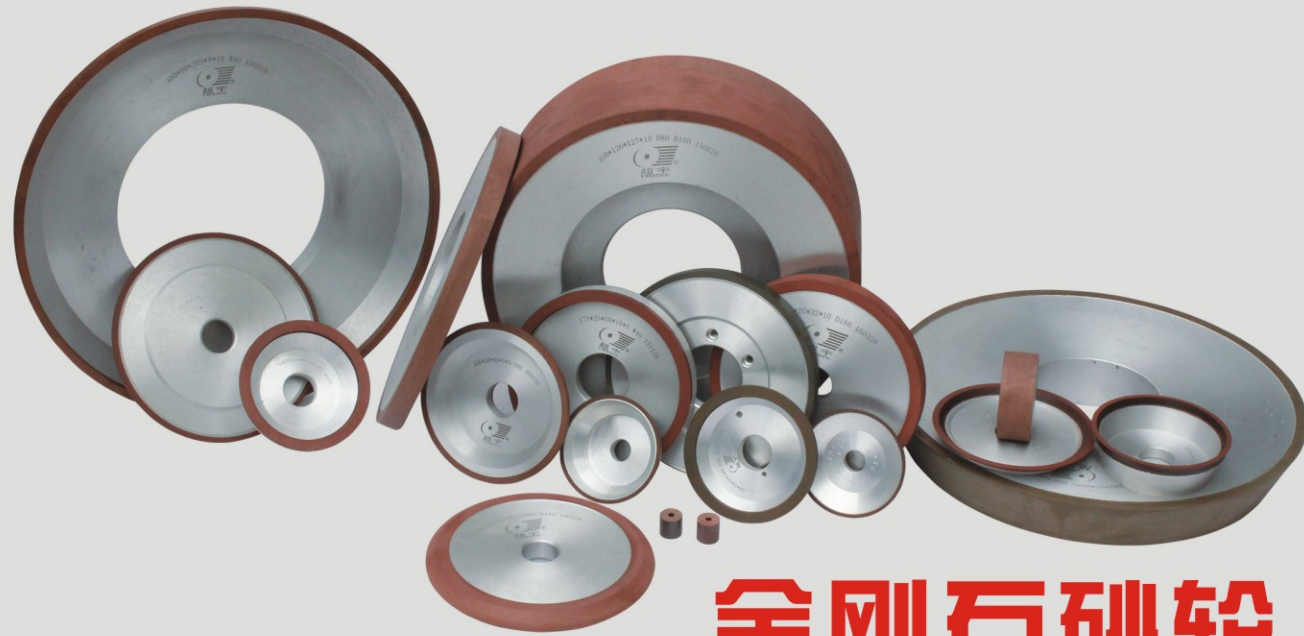


■ 硬质合金特殊性能产品

Cemented carbide special parts







# 金刚石砂轮

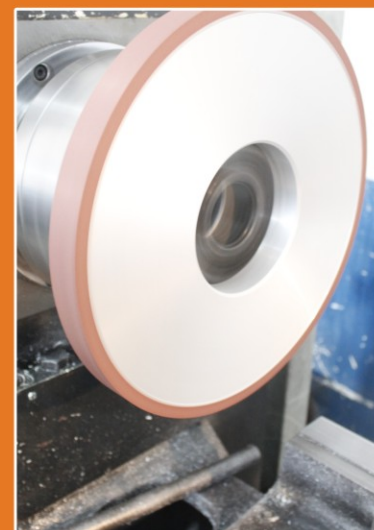
## Diamond abrasives

### ■ 金刚石砂轮标准形状代号总览

Overview of sketch and type code

<b>平行系列</b> Plain series	1A8型	1A1/T2型	
	1A1/T3型	14E1型	4B1型
	14A1型	3A1型	1F1型
	1A1R型		
<b>杯、碗、碟形、双面凹系列</b> Cupulat, taper cup, dish, recess series	6A2型	6A9型	
	11V9型	11A2型	12A2/45° 型
	12A2/20型	12D1型	12V9型
	12V2型	11EE9型	11C9型
	9A3型	2A2型	

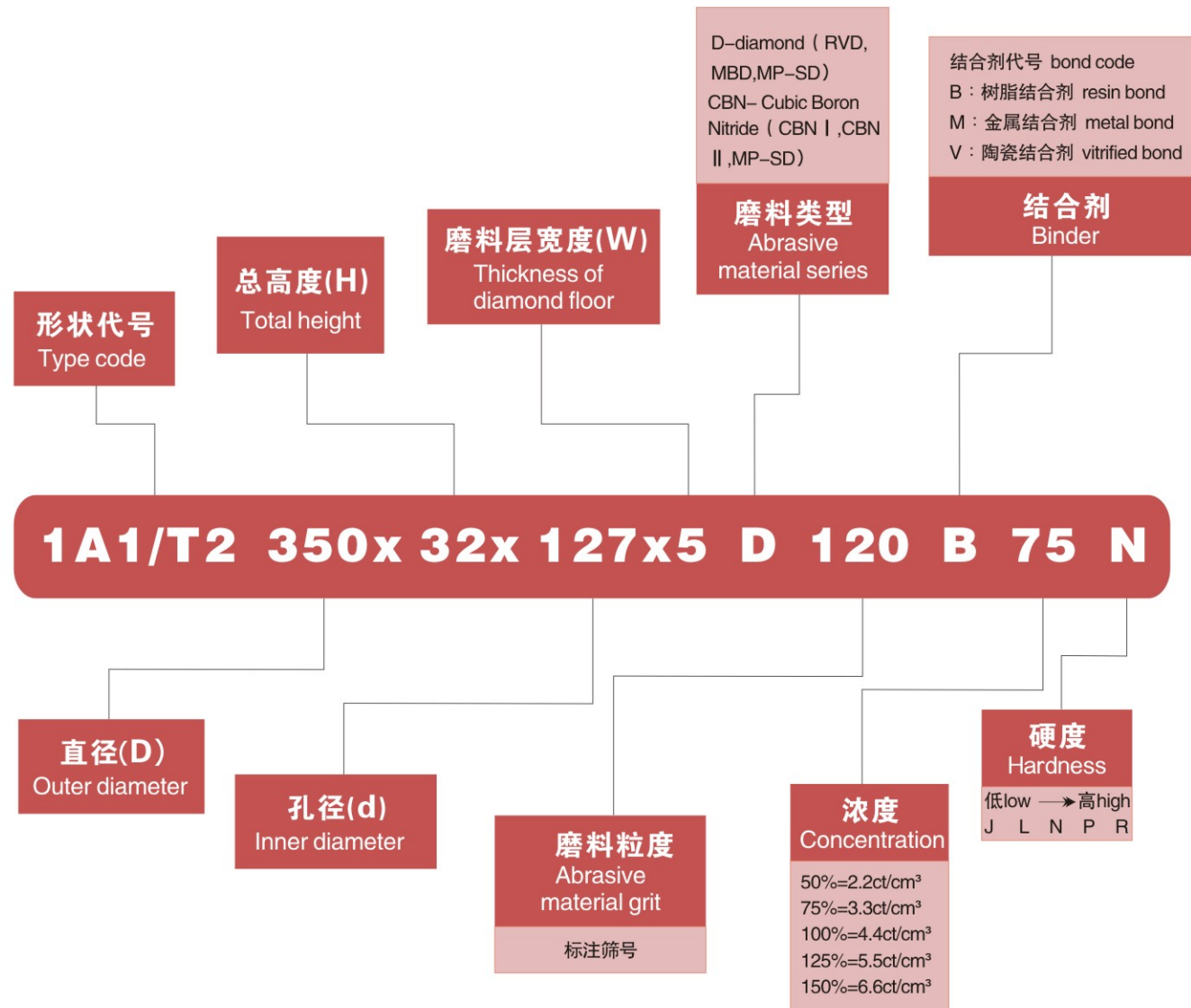
表格中未出现的砂轮型号，我们欢迎客户提供图纸，我公司可提供定制产品。  
OEM is more than welcome as customized drawing.





## ■ 金刚石和立方氮化硼砂轮的编号规则

### Diamond and CBN wheels designation



## ■ 产品展示

### Diamond and CBN wheels gallery

**平行小砂轮1A8(PX)**  
Straight grinding wheel

结合剂B.M

◆ 硬质合金产品内孔磨削用  
For internal grinding of cemented carbide products.

尺寸(mm) Dimension		金刚石含量(ct/片) Diamond content/pc		
D	H	d	75%	100%
6	10	3	0.70	0.93
8	10	3	1.43	1.90
10	10	3	2.36	3.14
12	10	4	3.33	4.44
15	10	6	4.9	6.53

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**平行加强砂轮14A1(P) 3A1(P)**  
Straight grinding wheel

结合剂B.M

◆ 光学玻璃磨边用  
For edge grinding of optical glass.

尺寸(mm) Dimension		金刚石含量(ct/片) Diamond content/pc				
D	H	d	W	X	75%	100%
80	20	30	3		47.87	63.83
125	20	50	4		100.30	133.74
300	20	127	5	7.5	114.63	152.84
400	20	203	5	7.5	153.49	204.65

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**平行砂轮1A1/T2(PX)**  
Straight grinding wheel

结合剂B.M

◆ 硬质合金产品的外圆磨削用, 刃磨加工用  
For external grinding and cutting edge grinding of cemented carbide products.

尺寸(mm) Dimension		金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	75%	100%
40	10	10	5	18.13	24.
60	20	10	5	56.99	75.99
100	20	20	5	98.44	131.25
150	20	32	5	150.32	200.43
200	20	32.75	5	202.16	269.55
250	20	75.127	5	254.10	338.80
300	25	127.203	5	382.50	510.00
350	30	127.203	5	572.30	763.00
400	30	203	5	655.40	873.80
600	40	305	10	2445.43	3260.58

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**无芯磨砂轮1A1/T3(PW)**  
Centerless grinding—wheels NO.3

结合剂B.M

◆ 无芯磨床上用于加工外圆  
For centerless grinding machine.

尺寸(mm) Dimension		金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	75%	100%
200	50	75	5	505.15	673.53
300	100	127	10	3004.98	4006.64
350	125	127	10	403.85	5871.8
400	150	203	10	6061.77	8082.36
500	150	305	10	7616.07	10154.76
305	150	120	10	4585.19	6113.58
455	205	228.6	10	9452.73	12603.65
455	255	228.6	10	11758.28	15677.71

其他规格按客户要求提供  
Special size can be produced as customized requirement.



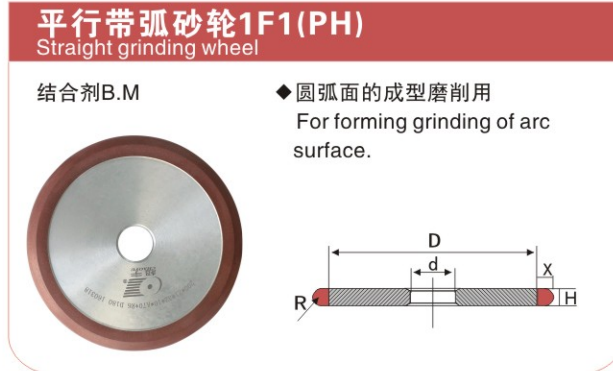
## 产品展示

### Diamond and CBN wheels gallery

**平行带弧砂轮1F1(PH)**  
Straight grinding wheel

结合剂B.M

◆圆弧面的成型磨削用  
For forming grinding of arc surface.



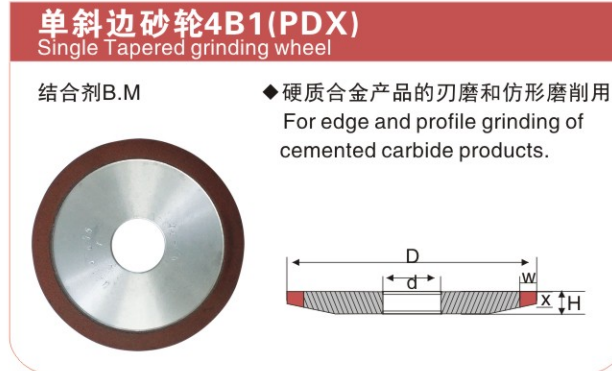
尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc			
D	H	d	X	R	75%	100%
80	6	10.20	6	3	24.47	32.62
100	8	20	8	4	54.05	72.07
150	10	32	8.5	5	108.25	144.34

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**单斜边砂轮4B1(PDX)**  
Single Tapered grinding wheel

结合剂B.M

◆硬质合金产品的刃磨和仿形磨削用  
For edge and profile grinding of cemented carbide products.



尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	X	75%	100%
75	8	10.20	5	0.5	4.35	5.8
100	10	20	5	0.5	5.7	7.6
125	10	32	8	0.5	15	20
150	10	32	8	0.5	18.23	24.3

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**双斜边砂轮14E1(PSX)**  
Double Tapered grinding wheel

结合剂B.M

◆硬质合金类齿轮滚刀，螺纹刀具的成型磨削用  
For forming grinding of gear cutter hob and chasing tools.




尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc				
D	H	d	W	X	$\alpha^\circ$	75%	100%
60	6	10	6	3	60°	8.48	11.30
75	6	20	6	3	60°	10.88	14.50
100	6	20	6	3	60°	14.78	19.70
125	6	32	6	3	60°	18.75	25.00
150	8	32	6	3	60°	22.20	29.60
200	10	32	8	5	60°	62.40	83.20

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**杯形砂轮一号6A2(B)**  
Straight cup grinding wheel

结合剂B.M

◆主要用于硬质合金刀具、高速钢刀具的刃磨，亦可用于铣磨  
For edge grinding of cemented carbide tools and HSS tools, also for milling and grinding.



尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	X	75%	100%
100	32	20	5	3	14.78	19.70
100	32	20	10	3	28.00	37.30
125	32	32	5	3	18.75	25.00
125	32	32	10	3	35.78	47.70
150	32	32	10	3	43.58	58.10
200	60	32	10	3	59.1	78.80

其他规格按客户要求提供  
Special size can be produced as customized requirement.

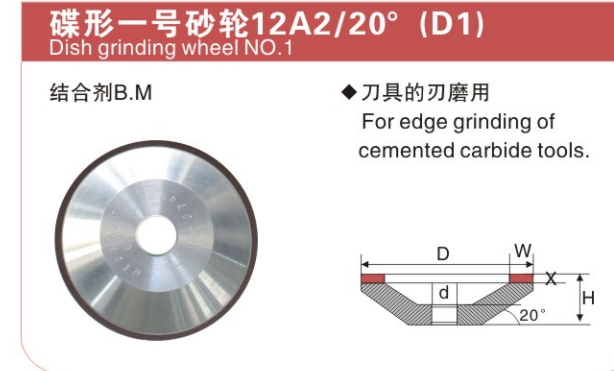
## 产品展示

### Diamond and CBN wheels gallery

**碟形一号砂轮12A2/20° (D1)**  
Dish grinding wheel NO.1

结合剂B.M

◆刀具的刃磨用  
For edge grinding of cemented carbide tools.



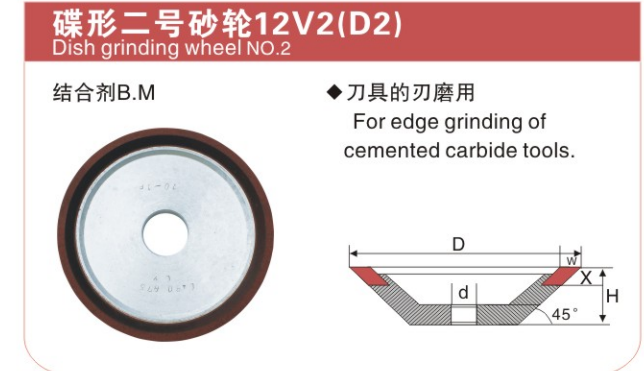
尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	X	75%	100%
100	13	20	5	3	14.78	19.7
125	13	32	5	3	18.68	24.9
150	16	32	10	3	43.58	58.1

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**碟形二号砂轮12V2(D2)**  
Dish grinding wheel NO.2

结合剂B.M

◆刀具的刃磨用  
For edge grinding of cemented carbide tools.



尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	X	75%	100%
100	13	20	3	3	8.78	11.7
125	16	32	5	3	18.19	24.25
150	16	32	5	3	22.09	29.45

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**碗形一号砂轮12A2/45° (BW1)**  
Taper cup grinding wheel NO.1

结合剂B.M

◆刀具刃磨和平面铣磨削用  
For edge grinding, surface milling and grinding.



尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	X	75%	100%
75	25	10.20	5	3	10.88	14.50
100	32	20	5	3	14.85	19.80
100	32	20	10	3	27.97	37.30
125	32	32	5	3	18.68	24.90
125	32	32	10	3	35.78	47.70
150	32	32	10	3	43.58	58.1

其他规格按客户要求提供  
Special size can be produced as customized requirement.

**碗形二号砂轮11V9(BW2)**  
Taper cup grinding wheel NO.2

结合剂B.M

◆刀具的刃磨用  
For edge grinding of cemented carbide tools.



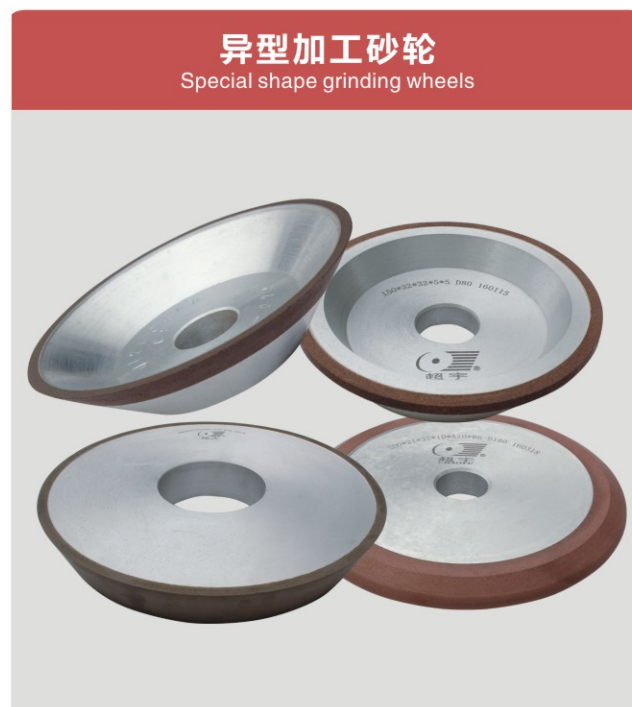
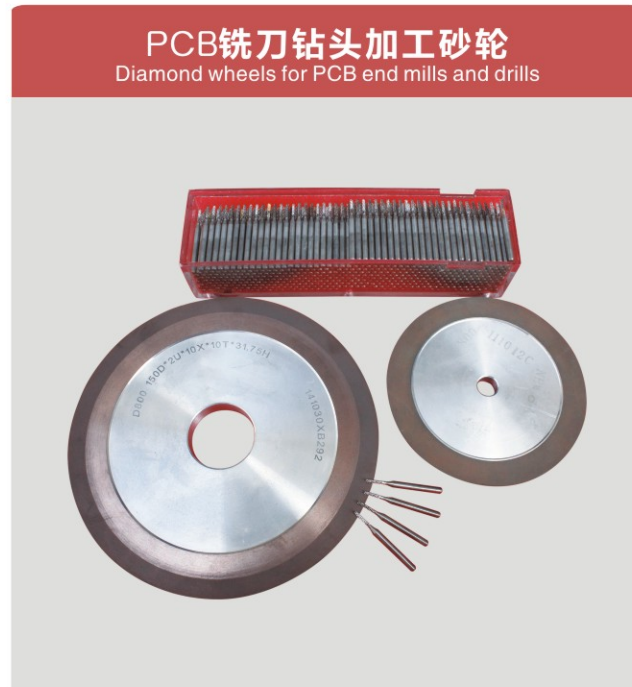
尺寸(mm) Dimension			金刚石含量(ct/片) Diamond content/pc			
D	H	d	W	X	75%	100%
100	40	20	3.5	7	23.85	31.80
125	40	32	3.5	7	30.38	40.50
150	45	32	5	7	51.70	68.95

其他规格按客户要求提供  
Special size can be produced as customized requirement.



## 产品展示

### Diamond and CBN wheels gallery



## 选择指导

### Seleceion guide

#### 形状和尺寸选择 Selection of type and dimension

磨具的形状和尺寸的选择应根据用户所使用的机床和加工工件对模具的要求来决定，设计时请参照标准形状和尺寸表，尽可能选用标准形状和尺寸。

Grinding wheels is decided by grinding machine type and requirement on workpiece. Try to choose standard type and dimension as per international standard table when grinding facility and wheels are designed.

#### 磨料选择 Selection of abrasive material

磨料的选择主要根据被加工材料性质和结合剂而定，参考表1。

Abrasive material is decided by material of workpiece and bond type.

#### 金刚石和立方氮化硼品种及适用范围 Abrasive material type and applications

表1 table 1

磨料品种 Series	品种代号 Code	粒度范围 Range of granularity degree	适用范围 Applying fields
金刚石 Synthetic diamond	RVD	60/80-270/400	用于树脂、陶瓷结合剂磨具或研磨等，对磨削硬质合金、玻璃、磁性材料等有很好的效果。 Be used to make grinding tools in resinoid/ceramic binder or for grinding etc. Good effect for grinding machine of cemented carbide, glass, magnetism material.
	MBD	60/80-270/400	用于金属结合剂磨具、电镀制品或研磨等，一般适用于硬质合金、玻璃、磁性材料等得粗磨和半精磨加工。 Be used to make grinding tools in metallic binder, plating products, drilling tools or for grinding etc. Suitable for rough grinding or semi-finish grinding of cemented carbide, glass, magnetism materials.
	MP-SD	W0/0.5-W36/54	主要用于硬、脆金属和非金属（如玻璃、陶瓷和宝石等）材料的精磨、研磨和抛光。 Mostly used for finish grinding or polishing of hard brittle and nonmetallic materials.
立方氮化硼 Cubic Boron Nitride	CBN I	20/30-270/400	用于树脂结合剂磨具等，适用于模具钢等材料的磨削加工。 Be used to make grinding tools in resinoid binder, Suitable for grinding of mould steel.
	CBN II	20/30-270/400	用于金属结合剂磨具等，适用于模具钢等材料的磨削加工。 Be used to make grinding tools in metallic binder, Suitable for grinding of mould steel.
	MP-CBN	W0/0.5-W36/54	主要用于硬、脆金属材料研磨和抛光 Suitable for grinding or polishing of hard materials.

#### 粒度选择 Selection of grit

磨料的粗细直接影响加工件表面粗糙度，磨削效率和磨具损耗。选择时要考虑主要要求，选出最佳粒度。在满足加工工件表面粗糙度要求的条件下，选用尽可能粗的粒度，可以提高磨削效率，降低磨具损耗。

Roughness of work piece, grinding efficiency and abrasive material loss are all related with grit, which should be decided by the most important factor. Coarse grit will be chosen when roughness stand could be meet to improve grinding efficiency and avoid much abrasive material loss.

金刚石粒度及尺寸对照表参见表2。

Grit number and grit size as table 2.

针对具体使用条件选用砂轮粒度可参考表3

The relationship between grit number, roughness request of work piece and grinding procedure as table 3.



## 选择指导

### Seleceion guide

表2 table 2

磨粒 Grit				微粉 Micro-powder	
粒度号 Grit number	粒度尺寸(μ) Dimension	粒度号 Grit number	粒度尺寸(μ) Dimension	粒度标记 Granularity	粒度尺寸(μ) Dimension
35	500~400	120	125~100	W40	40~28
45	400~315	150	100~80	W28	28~20
60	315~250	180	80~63	W20	20~14
70	250~200	240	63~50	W14	14~10
80	200~160	280	50~40	W10	10~7
100	160~125	320	40~28	W7	7~5

表3 table 3

粒度 Granularity	硬质合金工件表面粗糙度 Roughness requirement of work piece		磨削工序 Grinding procedure
	树脂结合剂B	金属结合剂M	
60/70-100/120		1.0-0.4	粗磨Rough
100/120-140/170	0.4-0.2	0.8-0.2	半精磨Semi-finishing
140/170-230/270	0.2-0.1	0.4-0.2	精磨Finishing
270/325-W20	0.1-0.05	--	精磨Finishing
W14-W5	0.05-0.025	--	研磨Super grinding
W5-W1	0.025-0.012	--	研磨Super grinding

### 结合剂选择 Selection of bond

不同的结合剂有着不同的性能，根据不同的加工对象、要求和方法来选用不同的结合剂。

树脂结合剂磨具(B)：磨削效率高，自锐性好，不易堵塞，易修整，但不宜承受大负荷磨削，否则磨具损耗较快，寿命降低，主要适用于粗磨、半精磨、精磨、刃磨、抛光硬质合金、铁氧体等工件；半精磨、精磨玻璃、陶瓷、磨具钢等。

金属结合剂磨具(M)：结合强度高，能承受大负荷切割和磨削，耐磨性好，适用寿命长。主要用于铁氧体磁材、玻璃、陶瓷、石材、耐火材料、宝石等的切割、粗磨、半精磨和成型磨削以及硬质合金刀具、工具的粗磨和电解磨削等。

Resin bond: high grinding efficiency, good self-dressing ability, and not easy to block, easy to be dressed, but not suitable for load-bearing grinding in case of fast abrasive material loss. It is mainly used for rough grinding, semi-finishing, finishing, edge grinding, polishing of cemented carbide, glass, ceramics, mould steel, etc.

Metal bond: suitable for load-bearing grinding with high compressive strength, good wear-resistance, long service life. It is mainly used for cutting, rough grinding, semi-finishing, and profiling grinding of stone, gem, ceramics, optical glass and fireproofing material, and rough grinding of cemented carbide inserts and electrolytic grinding.

### 浓度选择 Selection of concentration

浓度是指磨料在磨具磨料层中的含量，浓度选择一般根据结合剂和所需用途不同而不同，一般采取：

- ①树脂结合剂磨具采用50%~75%的浓度；
- ②金属结合剂磨具一般采用100%~150%的浓度；
- ③对于工作面宽的磨具，用于磨槽和成型磨削磨具应采用较高浓度；
- ④粗磨用较高浓度，半精磨用中等浓度，精磨用较低的浓度。

Concentration means abrasive material content in the abrasive layer, which is mainly related with bond type and applications, usually as below:

- ①50%~75% is usually applied in resin bond wheels.
- ②100%~150% is usually applied in metal bond wheels.
- ③Higher concentration should be chosen for wider surface grinding, groove grinding and profiling grinding.
- ④High concentration for rough grinding, medium concentration for semi-finishing, lower concentration for finishing.

### 浓度代号与磨料含量关系

The relationship between diamond concentration and content

浓度 Concentration	代号 Code	磨料含量 Content	
		体积%Diamond volume in the diamond floor	克拉 Carat/cm <sup>3</sup>
25%	25	6.25	1.1
50%	50	12.5	2.2
75%	75	18.75	3.3
100%	100	25	4.4
150%	150	37.5	6.6

注：金刚石比重为3.52克/立方厘米。Diamond: 3.52g/cm<sup>3</sup>

## 选择指导

### Seleceion guide

为了更好的利用砂轮的加工特性，在使用时我们还要注意以下几个方面：

Tips to improve grinding efficiency :

### 冷却液的选择 Selection of coolant

在金刚石砂轮的磨削过程中，一般采用煤油、稀乳化液作为冷却液，也可使用轻柴油、变压器油、机油和煤油的混合物及专用磨削液。必须特别指出：树脂结合剂砂轮不宜用碱性冷却液，而非金属材料的加工业可用水做冷却液。

Kerosene, emulsion, water, transformer oil can be used for coolant proceeding grinding.

Attention: alkalescent coolant is not suitable for grinding-wheels in resinoid binder.

冷却液流量：3-8升/分为宜。

Coolant flux: 3-8(l/min) is in commonly.

### 砂轮线速度的选择

#### Selection of speed of grinding-wheel

砂轮线速度选择Vc Selection of speed of wheels		
结合剂 bond	冷却方式 Cool way	砂轮线速度 (米/秒)Vc(m/s)
青铜 M	干磨 Dry	12-18
	湿磨 Wet	15-22

砂轮线速度选择Vc Selection of speed of wheels		
结合剂 bond	冷却方式 Cool way	砂轮线速度 (米/秒)Vc(m/s)
树脂 B	干磨 Dry	15-20
	湿磨 Wet	18-25

### 磨削深度的选择

#### Selection of grinding allowance

磨削深度的选择ap Selection of grinding allowance				
磨削方式 Grinding procedure	平磨 Plain grinding	外圆磨 Cylindrical grinding machine	内圆磨 Internal grinding machine	刃磨 Edge grinding
磨削深度ap(mm)	0.005-0.03	0.002-0.02	0.002-0.01	0.01-0.03

为了保证最大的磨削效率，必须用氧化铝或碳化硅砂轮修金刚石和立方氮化硼砂轮表面，以使金刚石或立方氮化硼磨粒暴露出刃。

To improve grinding efficiency, aluminum oxides wheels or silicon carbide wheels must be used to dress the surface of diamond and CBN grinding wheels, in order to make diamond and CBN abrasive material exposed from bond.

金刚石砂轮 Diamond abrasives		修整用砂轮 Dressing wheels			
结合剂 Bond	金刚石粒度 Grit	粒度 Grit	磨料 Abrasive material	硬度 Hardness	结合剂 Bond
青铜 M	60-180	60-46	TL	ZR2-Z1	A
	240	60	TL	ZR1-ZR2	A
树脂 B	80-180	60	TL	ZR1-ZR2	A
	240目以细	80	TL	R3-ZR2	A



# 机械加工 模具生产线

## Further machining Mold manufacture



### 机械加工综合能力强

车、铣、磨（平磨、外圆磨、工具磨、无心磨）床、热处理炉、线切割、电加工设备先进。

### 模具制造工艺成熟，技术精湛

各种模具夹具制作

### 硬质合金制品深度加工

### A wide range of all-round machining capacity

Turning, milling, grinding (flat grinding, outer diameter grinding, tool grinding, centerless grinding) Advance equipment (HIP sintering furnace, wire cutting machine, EDM facility)

### High technical maturity on moulds production.

Production of various moulds and holder

### Fine finishing of tungsten carbide items.

## 生产车间

## Workshop Equipment





## 全球布局

### Sales Network



“超宇”牌硬质合金、金刚石/CBN砂轮等产品畅销全国，远销到东南亚、南美和欧盟部分国家和地区，受到广大客户的青睐。

Tungsten carbide items and diamond/CBN grinding wheels of CHAOYU brand are stably supplied in domestic market, Southeast Asia, South America, and Europe with high reputation.