



**苏州帝能精密工具有限公司**  
Suzhou DiNeng Precision Tools Co.,Ltd.



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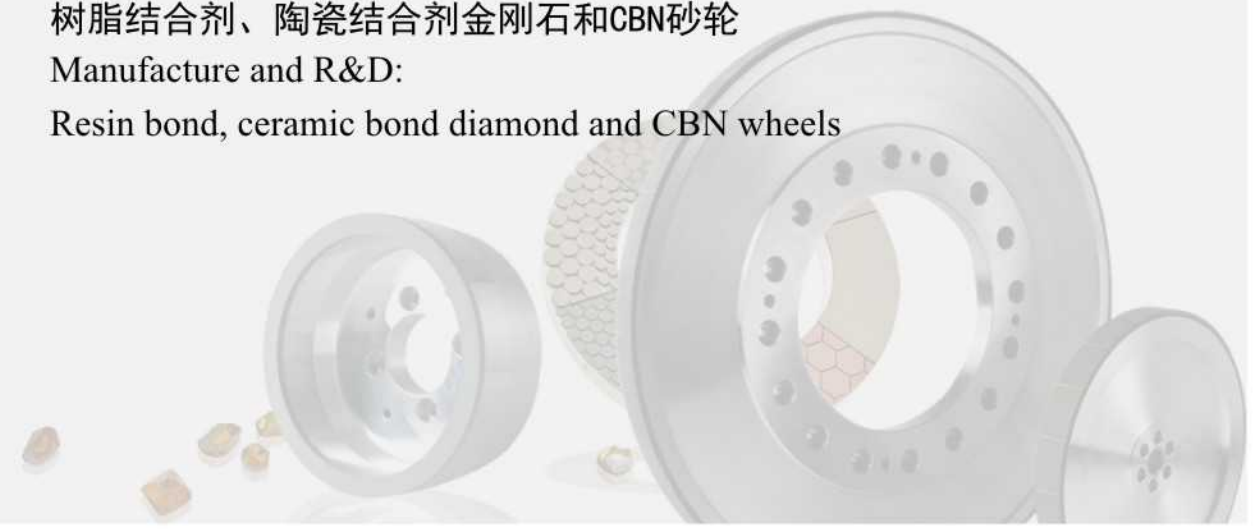
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生产、研发:

树脂结合剂、陶瓷结合剂金刚石和CBN砂轮

Manufacture and R&D:

Resin bond, ceramic bond diamond and CBN wheels



Professional technology  
Excellent quality  
专业的技术 · 过硬的质量

# INTRODUCTION

## 公司简介

苏州帝能精密工具有限公司是一家集科技、开发、设计研究、生产制造、销售为一体的人造金刚石砂轮专业生产厂家，主要生产超硬工具制品，精密工具，金刚石和CBN砂轮，月产各类金刚石和CBN砂轮超过15,000片。产品规格齐全，多达300多个品种，质量达到国际标准。目前的产品种类有：树脂结合剂、陶瓷结合剂金刚石和CBN砂轮。金刚石砂轮广泛适用于硬质合金刀具、刃具、合金工件、玻璃、陶瓷、木工刀具行业等高强度、高韧性材料的磨削和抛光。金刚石和立方氮化硼（CBN）磨料作为半永久性超高速磨具在一般钢材的加工中发挥着日益突出的作用。它可在很长使用期间内不修整，非常适宜自动化、半自动化和多机台管理生产中稳定地高精度磨削。公司拥有科学的质量管理体系，先进的生产设备和良好的售后服务。在客户中已经建立起了良好的信誉，产品远销欧美及亚洲三十多个国家，与众多品牌建立了良好的代工体系，高效、专注、创新是我们长期坚守的信念，客户满意是我们的目标，我们期待与您携手共创高效工作。

Suzhou DiNeng Precision Tools Co., Ltd. is a professional manufacturer specialized in the development, research, production and sales of diamond grinding wheels. Main products are including super abrasives tools, precision tools, diamond and CBN wheels, with monthly production of more than 15,000 pcs. With as many as 300 product varieties, the quality reaches the international standard. Current product categories include: resin, vitrified bonded and diamond & CBN wheels. Diamond wheels are widely used in the grinding and polishing of high strength and high toughness materials, such as carbide knives, cutting tools, alloy work piece, glass, ceramic, and woodworking, etc. Diamond and CBN abrasive, used as semi permanent and high speed grinding tools, are playing more and more important role in the steel processing. No need to be fixed within a very long using period. Suitable for high precision stable grinding in the production of automatic, semi-automatic and multi-equipment.

With scientific quality management system, advanced production equipment and good after-sales services, the company has established good reputation within the customers. Products are widely sold to more than 30 countries in Europe, America and Asia, and build excellent OEM system with many brands.

Efficiency, focus and innovation is our long held beliefs, and customer satisfaction is our goal. We look forward to working with you to create a highly efficient work.





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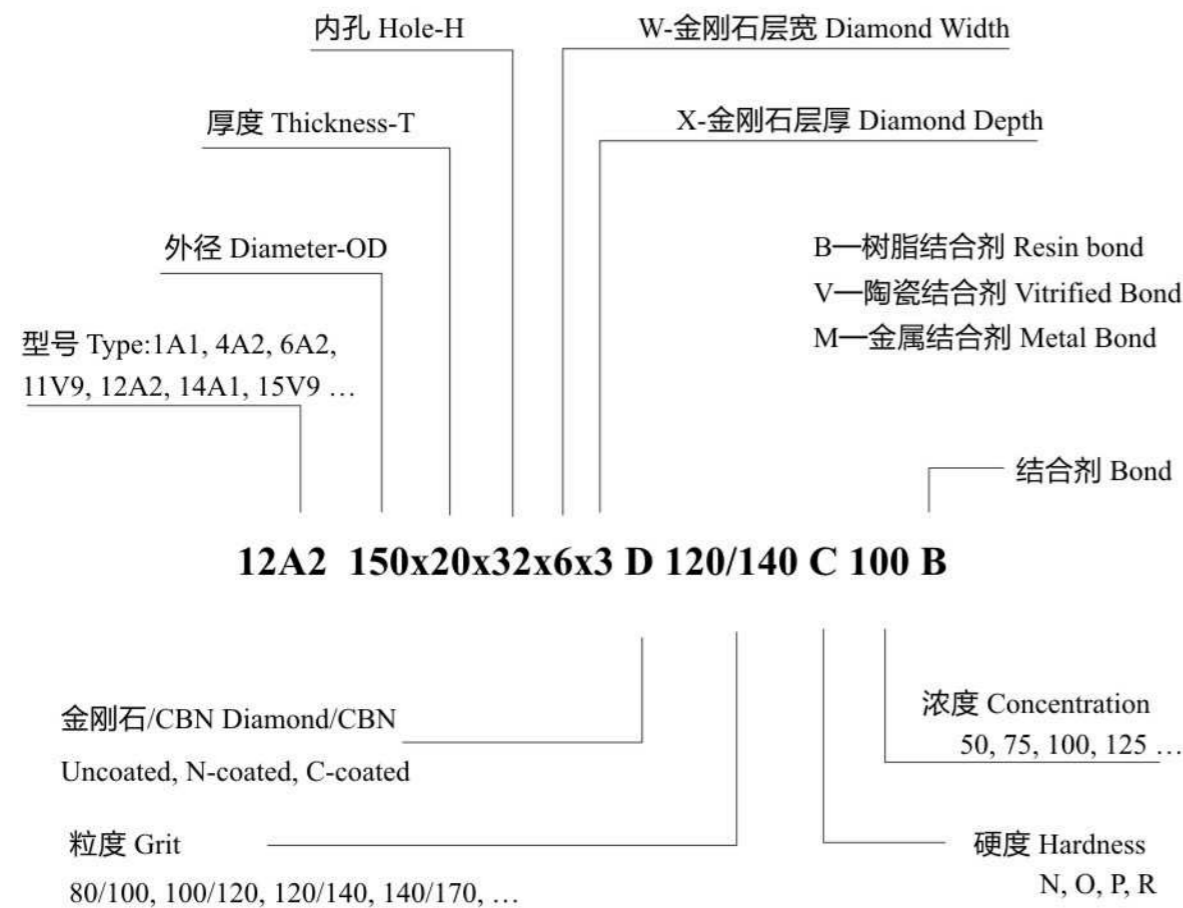
## 金刚石和CBN砂轮型号 Types of Diamond and CBN Wheels

Shape	Shape	Shape	
6A2		11V9	
6A2C		12A2	
6A2H		12V4	
6A9		12V5	
9A3		12V9	
9A3H		15A2	
11A2		15V9	
11A9		W8	
11V4		HH1	
11V5		HH2	

Shape	Shape	Shape	
1A1		1G1	
1A1R		1L1	
1A8		1M1	
1D1		1Q1	
1DD1		1QQ1	
1E1		1V1	
1EE1		1Y1	
1E9		2A2T	
1F1		3A1	

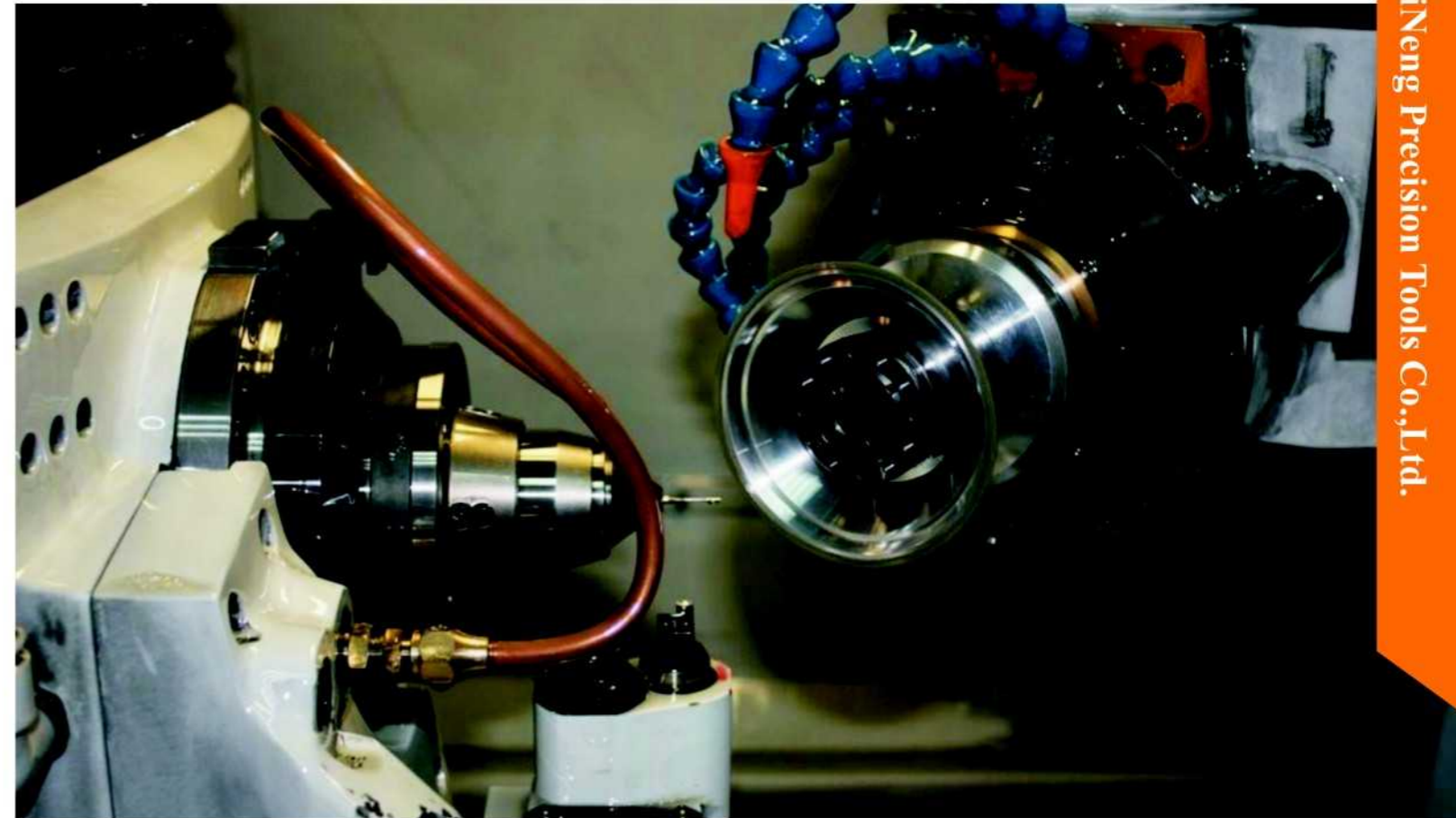
## 金刚石和CBN砂轮标注方法

### Legend for Diamond and CBN Wheels



## 刀具加工金刚石和CBN砂轮

### Diamond & CBN Wheels for Multi-Axis CNC Grinders



#### 整体刀具砂轮

##### Solid Tools

**砂轮规格 Shapes:** 1A1、14A1、11V9、1V1

**砂轮应用:** 开槽磨削、铲磨、周边磨削、断面磨削、齿隙磨削

**Application:** Fluting, grooving, relief grinding, peripheral grinding, section grinding and tooth grinding.

**应用设备 Grinders:** Walter、Anca、Saacke、Ewag

高精度CNC磨床专用砂轮，应用于单轴或多轴联动的数控磨床。该砂轮由耐热性极好的树脂结合剂以及树脂-金属复合结合剂与优质金刚石或CBN制成，具有精度高、转速高、磨削效率高和保持性好等特点，已完好应用于Walter, Anca, Ewag等高精度数控磨床。

The wheels for multi-axis CNC grinders are professional quality with polyamide and hybrid bonds and high quality diamonds, giving high speed performance, accuracy, efficiency and excellent shape-retention qualities. These products have been successfully used in grinders, such as Walter, Anca, Ewag, etc.

## 如何订购

订购砂轮时，请尽量将以下信息告诉我们：

砂轮的型号、尺寸（外径、厚度、孔径、磨料层宽度及深度）、磨料种类、粒度、结合剂类型、浓度、磨削方式（干磨或湿磨）以及被加工材料、使用设备、型号等。描述越清楚越可能匹配到最适合的砂轮。

### How to order

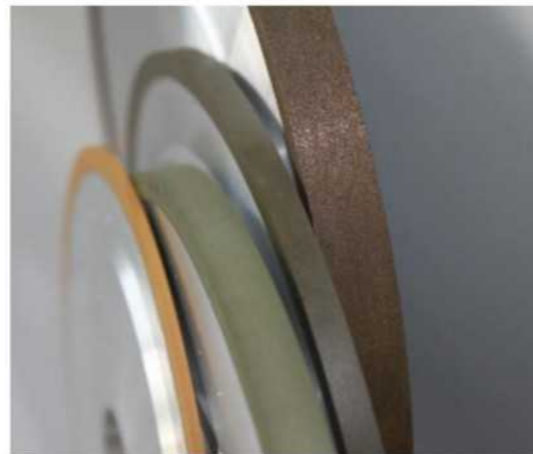
Provide us with a detailed description of your specific needs as follows:

Type – such as 1A1, 1A1R, 6A2, 11V9, etc.

Size – the diameter and thickness of the hole; the width and depth of the abrasive layer, any angle measurements

Specification – Abrasive (D or CBN), grit, bond, concentration

Workpiece – material, grinding process (wet or dry) and type machine used

**强力开槽砂轮****Wheels for power grooving****砂轮规格 Shapes:** 1A1、1V1**结合剂类型 Bond:** 复合结合剂 Hybrid**砂轮应用:** 整体硬质合金钻头、铣刀、铰刀等数控刀具**Application:** Solid carbide drills, milling cutter, reamer, etc.**砂轮加工参数:** 线速度16-25m/s, 单次进给量2.4-4.0mm, 进给速度80-130mm/min。**Working parameter:** 16~25m/s, single feed 2.4~4.0mm by the feed speed 80~130mm/min.**砂轮特点:** 兼具树脂结合剂的锋利性好、自锐性好和金属复合结合剂刚性好、强度高、形状保持性好的优点。切深大、进给快, 磨削加工效率高; 耐磨性及形状保持性好, 修整间隔长; 加工工件质量完美, 粗糙度、尺寸精度符合要求; 微震动、低负载, 对机床损伤小; 加工效率比树脂砂轮提高100-150%。**Features:** Have the advantages of both resin and metal bonds. Free cutting and self-sharpening with good rigidity and strength, Excellent shape-retention, with big, deep and fast feed. Long dressing interval resulting in good quality workpieces. Minimal vibration, low load produces an efficiency rate 100~150% higher than with only a resin bond.**树脂结合剂CBN砂轮****Resin bonded CBN Wheel****砂轮形状 shapes:** 1A1、14A1、11V9、12V9**应用范围:** 主要用于高速钢、合金钢钻头、铣刀、铰刀等数控刀具的开槽磨削、铲磨、周边磨削、端面磨削、齿隙磨削等**Application:** For the fluting, grooving, relief grinding, peripheral grinding, section grinding and tooth grinding of HSS, alloy steel cutters, reamers, etc.**加工材质 Workpieces:** M2、M35、M2A1等高速钢**砂轮特点:** 切深大、进给快, 磨削加工效率高; 耐磨性及形状保持性好, 修整间隔长; 加工工件质量完美, 粗糙度、尺寸精度符合要求; 微震动、低负载, 对机床损伤小。**Features:** Deep grinding, feed fast, high efficiency, good wear resistance and shape-retention, Minimal vibration, low load.**加工参数:** 线速度25-30m/s, 单次进给量为1.0-2.5mm, 进给速度为300-400mm/min**Working parameter:** 25~30m/s, single feed 1.2~2.5mm by the feed speed 300~400mm/min.**应用案例:** M2A1整体高速钢四刃铣刀,  $\Phi$  12mm铣刀加工时间为4min30s,  $\Phi$  10mm铣刀加工时间为3mi30s,  $\Phi$  8mm铣刀加工时间为2min30s**Examples of application:** Solid HSS four-edged milling cutter $\Phi$ 12mm by the time 4'30"; $\Phi$ 10mm by the time 3'30"; $\Phi$ 8mm by the time 2'30".**刀粒周边磨砂轮****Peripheral Grinding Wheels for Inserts****加工对象:** 硬质合金、陶瓷、金属陶瓷等材料的可转位刀片周边精密磨削加工。**Workpieces:** Precision peripheral grinding of indexable inserts for carbides, ceramics, metal-ceramics, etc.**加工设备 Grinders:** Agathon、EWAG、WAIDA、Wendt**砂轮特点:** 砂轮平面度好、砂轮磨削能力强, 砂轮耐用度强, 被加工工件的刃口质量优。**Features of the wheel:** Good flatness, strong grinding with good durability and edge sharpness of workpieces.**树脂刀粒周边磨砂轮****Resin Bonded Peripheral Grinding for Inserts.****砂轮形状 Shapes:** 2A2T、6A2T**磨料种类 Abrasives:** 金刚石 Diamond, CBN**结合剂 Bond:** 树脂结合剂 Resin**应用:** 标准硬质合金刀粒, 砂轮粒度: D25~D54

大型硬质合金刀粒, 砂轮粒度: D64, D76

精加工硬质合金刀粒, 砂轮粒度: D15~D35

陶瓷金属合金刀粒, 砂轮粒度: D25~D54

陶瓷刀粒, 砂轮粒度: D25~D54

**Application:** Standard Carbide Insert, Diamond grit: D25~D54

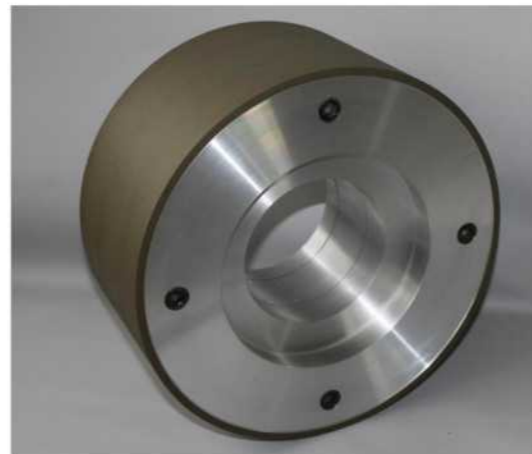
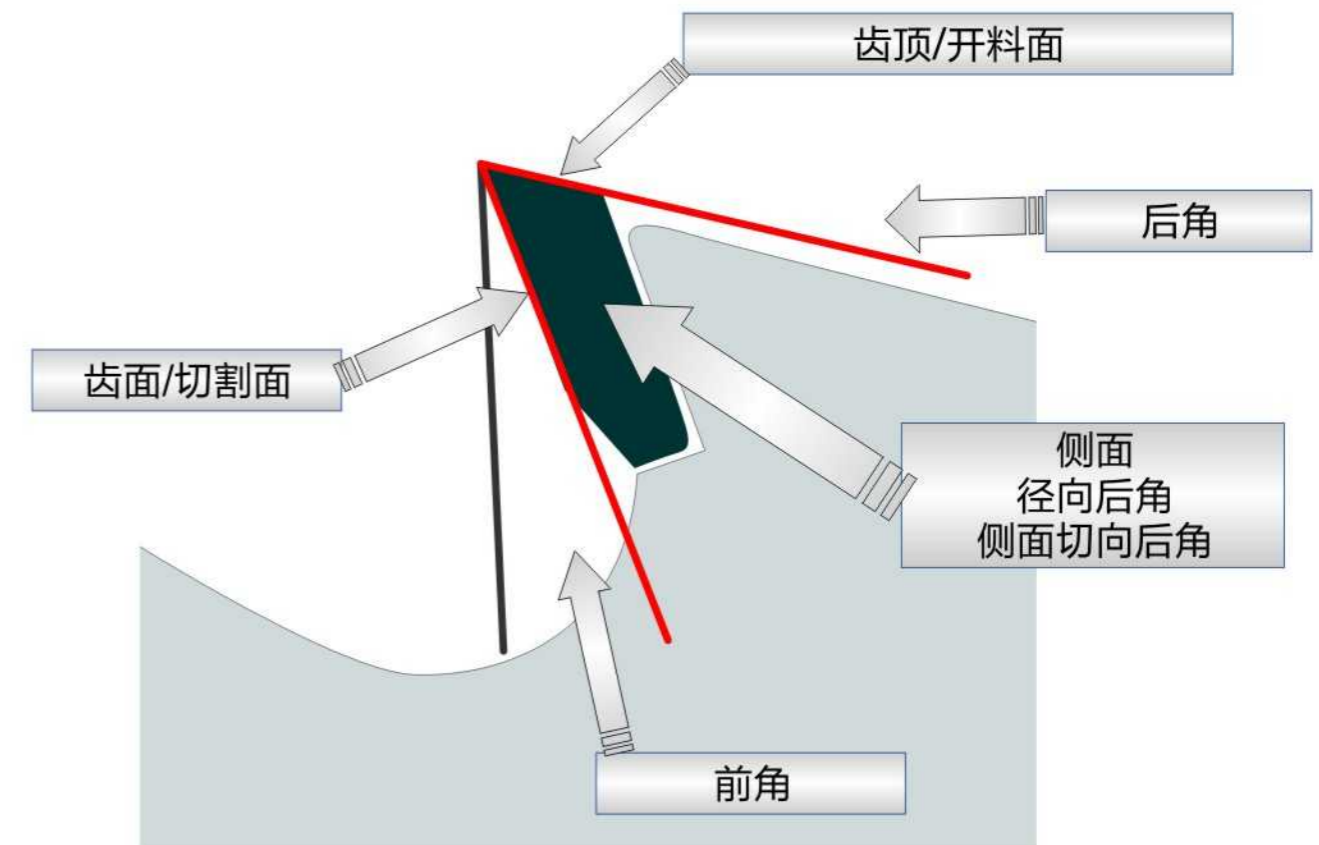
Larger Carbide Insert, Diamond grit: D64, D76

Finished Carbide Insert, Diamond grit: D15~D35

Ceramic-Metal alloy Insert, CBN grit: D25~D54

Ceramic Insert, Diamond grit: D25~D54



**PCD、PCBN陶瓷周边磨砂轮****Vitrified Peripheral Wheels for PCD & PCBN****砂轮形状 Shapes:** 2A2T, 6A2T**磨料种类 Abrasive:** 金刚石, Diamond**粒度 grits:** #400 ~ #4000**结合剂 Bond:** 树脂结合剂, Resin**砂轮尺寸 Diameter:** 350mm, 400mm.**应用:** 砂轮主要用于PCD与PCBN材质的刀具、刀片等切削工具的刃磨加工, 以及可转位刀片的周边磨加工。**Application:** These vitrified diamond wheels are used for the edge grinding and peripheral grinding of PCD, PCBN and other indexable tools**适用设备 Grinders:** AGATHON、EWAG、WENDT等手动及数控磨床。**产品特点:** 具有磨削锋利、耐用度高, 易修整, 型面精度保持性好, 刀片刃口质量好的优点。可根据需要提供致密型和气孔型各种规格**Features of the wheels:** Free cutting, good durability, easy to dress, with excellent shape-retention and good sharp edges of each workpiece, Both compact and porous can be supplied.**无芯磨砂轮****Centerless Grinding Wheels****树脂结合剂无芯磨砂轮:****砂轮形状 Shape:** 1A1**砂轮尺寸 Diameter:** 最大外径可做500mm,  
Up to 500mm.**磨料粒度 Grit:** 最细磨料#3000, Finest to #3000**磨料种类 Abrasives:** 金刚石 Diamond、CBN**加工对象:** 硬质合金、陶瓷、金属陶瓷、高速钢模具钢等材料的外圆。**Workpieces:** Cylindrical grinding of carbide, ceramic, metal-ceramic, Hss, dies ,steels, etc.**砂轮特点:** 砂轮能够批量高效率磨削; 砂轮锋利性好, 寿命长, 被加工工件的粗糙度低, 被加工工件同心度一致; 精加工后工件表面粗糙度低。**Features:** High efficient grinding of high batch quantities. Good sharpening and durability with high precision and concentricity of finished workpieces.**木工工具砂轮****Diamond/CBN Wheels for Woodworking****砂轮型号 Shapes:** 1A1, 3A1, 4A2, 6A2, 12A2, 12V2, 12V9, 14A1, 14F1**加工对象:** 硬质合金、金属陶瓷、PCD材料的圆锯片、带锯的前角、后角和侧面的数控刃磨及木工用钻头、铣刀及各类工具钢、合金钢刀具。**Workpieces:** Used for carbide, metal-ceramic, PCD circle and band saws and tools used in the woodworking such as edging tools, drills, milling tools and other tools made with tool steel and alloy steels.**特点:** 砂轮锋利性好, 磨削效率高, 寿命长, 加工工件的刃口质量优异、加工工件表面质量优异。**Features:** Free cutting, high efficiency, durability, good grinding quality.

## 圆锯片砂轮

## Diamond Wheels for Circle Saws

硬质合金圆锯片有三个部位需要磨削加工，齿前角，齿后角和齿两侧。不同部位需要以不同的砂轮在不同机器上完成。

There are three parts - face, top and sides which need to be ground for the teeth of a circle cutting saw. Different parts need different wheels to be ground on different machines. We can supply all the wheels for different applications.



## 前角砂轮 Wheels For Face Grinding

砂轮形状 Shape: 4A2, 12V2, 12V9, 可按齿距大小选择

Shapes: 4A2, 12V2, 12V9 chosed by pitch

磨料 Abrasive: 金刚石 Diamond

结合剂 Bond: 树脂 Resin

工件材质 workpiece: 硬质合金齿 carbide teeth

磨削部位: 锯片前角

Part of Grinding: Face of teeth

冷却液: 水冷, 油冷

Coolant: Water, Oil

设备 Grinders: Vollmer、Woodtronic、Akemat、Widma



## 后角砂轮 Wheels For Top Grinding

砂轮形状 Shape: 12A2、6A2

加工材质 Workpiece: 硬质合金齿 Carbide teeth

加工对象: 锯片后角

Workpieces: Top of the teeth.

应用设备 Grinders: Vollmer、Woodtronic、Akemat、Widma

砂轮特性: 砂轮锋利性好, 磨削效率高; 被加工工件平面度好; 砂轮耐用度好、寿命长; 砂轮能够同时进行粗加工和精加工, 被加工工件的表面光洁度好。

Features: Good sharpening, high efficiency, and durability. Suitable for coarse and fine grinding at same time. Results in a workpiece of good flatness and roughness.



## 侧面砂轮 Wheels For Side Grinding

砂轮形状 Shape: 1A1、3A1、14A1

加工材质 Workpiece: 硬质合金齿 Carbide teeth.

加工对象: 锯片侧角

Workpieces: Sides of the teeth.

应用设备 Grinders: Vollmer、Woodtronic、Akemat、Widma

砂轮特性: 砂轮锋利性好, 磨削效率高  
砂轮耐用度好、寿命长。

Features: Good sharpening and high efficiency, durability. Suitable for coarse and fine grinding at same time. Results in a workpiece of good flatness and roughness.

## 仿形砂轮

## Wheels For Profile Grinding

砂轮形状 Shapes: 14A1、14F1。

加工材质 Workpiece: 硬质合金齿

Carbide teeth

应用设备: 各种仿形磨齿机器。

Grinders: Profile Grinders

砂轮特性: 砂轮锋利性好, 磨削效率高;  
砂轮耐用度好, 修整间隔长。  
被加工工件的表面光洁度好。

Features: Good sharpening and high efficiency with long lasting durability and long dressing interval, Produces a workpiece of good quality.



## PCD锯片陶瓷砂轮

## Wheels For PCD Circle Saws

砂轮形状 Shapes: 3A1, 12A2

磨料 Abrasive: 金刚石 Diamond

结合剂 Bond: 陶瓷 Vitrified

设备 Grinders: Vollmer

应用: 12A2 125x18x32x6x8砂轮用于加工锯齿的前角和后角,  
3A1 100x10x32x10x6砂轮用于加工锯齿的两个侧面。

Application: the wheel

12A2 125x18x32x6x8 for the grinding of top and face,

3A1 100x10x32x10x6 for the grinding of two sides.

砂轮优点: 锋利性好, 寿命高

Features: Excellent sharpening and durability.



## 冷锯加工砂轮

### Wheels For Cold Saws

砂轮形状 Shapes:

磨料 Abrasives: 金刚石 Diamond, CBN

结合剂 Bond: 树脂 Resin

加工材质: 硬质合金、高速钢。

Workpiece: Carbide, HSS, etc.

砂轮特性: 磨削效率高、砂轮形状保持性好。耐用度好, 使用寿命长。

Features: Good grinding efficiency and shape retention, with durability.



## 木工刀具砂轮

### Wheels For Woodworking Tools

应用范围: 用于木工锯片齿面的快速、经济加工

Application: Used for quick and economic grinding

设备 Grinders: 孚尔默CP200\CHU, Vollmer

应用参数: 加工硬质合金圆锯片(板式锯) 300D-96T 砂轮线速度22m/s, 最大切削进给0.15mm

Parameters: At the speed 22m/s with the feed depth 0.15mm for the grinding of carbide circle saw 300D-96T

砂轮特点: 独特的几何结构使其在加工窄小齿间距锯片时具有显著优势  
多种规格能满足所有锯片自动研磨机  
磨削时间短、效率高  
磨削刃面平整、使用寿命长

Features: Suitable for the grinding of narrow gaps. Different wheels can be applied to different grinders with high grinding efficiency and lasting durability.



## 模具行业砂轮

### Diamond/CBN Wheels for Molds and Die

加工对象: 钨钢、硬质合金, 高速钢等。用于加工精度高的曲面, 高精度零件的槽, 内外R, 形状复杂而且尺寸要求高的刀具等等。

特点: 砂轮线速度高、跳动小、锋利性好、自锐性好、寿命长, 尖角形状保持好。

Workpieces: Tungsten steel, carbide, HSS, etc.

Application: For the grinding of curved surface, slots and grooves of high precision parts, arcs and radius of some complicated tools and cutters.

Features: High speed grinding, little run-out, free cutting, self-sharpening, durability and good shape retention.



## PG砂轮

### Wheels For PG Grinding

砂轮形状 Shape: 3A1, 14A1, 4B1

外径 Diameter:  $\Phi 65 - \Phi 180\text{mm}$

厚度 Thickness: 0.3mm ~ 2.0mm

尖角 Angle:  $7^\circ - 5^\circ$

磨料 Abrasive: 金刚石 Diamond, CBN

结合剂 Bond: 树脂 Resin, 金属 Metal

应用范围: 针对精磨模具、精密冲头、精密刀具进行的研削、仿削、曲线研削精修等等得精密加工。金刚石砂轮用来加工钨钢、陶瓷合金、陶瓷等超硬材料及其它难切削硬脆材料等。立方氮化硼砂轮用来加工SKS、SKH、SKD等高硬度铁系材料。

Application: For the polishing, curved and profile grinding of precision moulds and dies, punches, tools and cutters.

应用设备 Grinders: WAIDA、AMADA、WASINO、DOEBELI&PETEWE。

砂轮特点: 砂轮锋利性好、跳动小, 砂轮形状保持好, 切槽直, 被加工工件R角小。

Features: High speed grinding, little run-out, free cutting, self-sharpening, durability and good shape retention, small angle.

加工方式: 纵向往复进刀(干磨)

Process: Dry grinding with reciprocating feed.

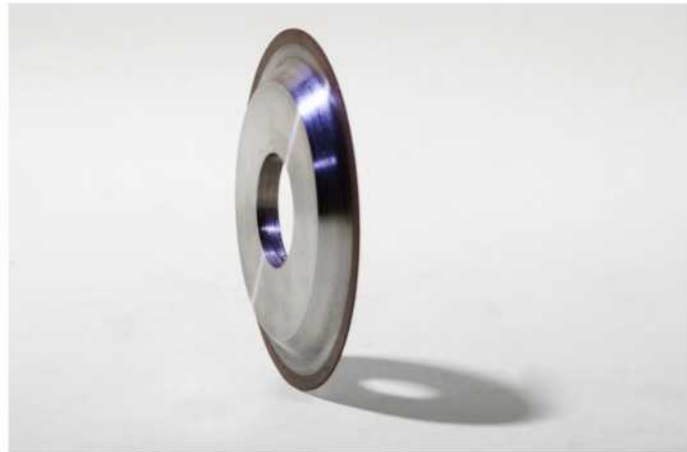
加工参数: 转速8000—10000转/min

Parameter: 8000 ~ 10000RPM



## 微钻行业砂轮

### Diamond/CBN Wheels for Micro-drills



此类砂轮用于精密加工棒料直径小，开槽深度浅的硬质合金和高速钢微钻。其特点是：锋利性好、形状保持优异、砂轮修正间隔时间长、加工出的工件表面光洁度优异等。

These resin bonded diamond and CBN wheels are used for the precision grinding of tungsten carbide and HSS micro drills with little diameter and shallow slots with the characteristics of free grinding, good shape-holding, less dressing and excellent workpiece finishing.

**加工对象:** 整体硬质合金、不锈钢焊接式PCB加工用微型铣刀、钻头的磨削。

**Workpiece:** Solid carbide and welded SS micro milling tools and drills.

**砂轮种类:** 无心磨砂轮，段差砂轮，开槽砂轮。

**Wheels:** Centerless, stages and fluting.

**磨料种类:** 金刚石，CBN

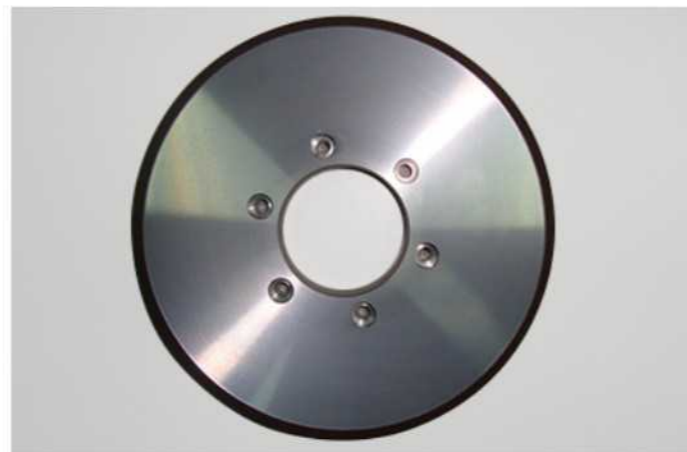
**Abrasives:** Diamond, CBN

**结合剂:** 树脂结合剂，陶瓷结合剂，陶瓷金属复合结合剂。

**Bonds:** Resin, Vittrified, Hybrid

**砂轮特点:** 砂轮的耐用度好，修正间隔长，形状保持优。刀具刃口缺陷少。

**Features of wheels:** Good shape holding, long dressing interval, free edge and good durability.



## 汽车行业CBN砂轮

### Vitrified CBN Wheels for Auto Industry



#### 磨曲轴、凸轮轴砂轮

#### Wheels for Crankshaft & Camshaft

**砂轮形状 Shape:** 1A1, 3A1, 14A1

**砂轮尺寸范围 Diameter:** 250mm ~ 650mm

**最高使用速度 Speed:** 160m/s

**应用范围:** 该砂轮适用于汽车、拖拉机以及运输机发动机曲轴连杆径及轴径面和凸轮轴桃形面及主轴径面的高效强力磨削。

**Applications:** The vitrified CBN wheels are used for high efficiency and heavy grinding of crankshaft and camshaft of Automobile, Tractor, Transport.

**可加工材料:** 适用于加工铸铁类（如冷激铸铁、球墨铸铁、灰口铸铁、合金铸铁等）与钢件类（如20Cr、GCr15、CF53、45钢、55钢、80B高碳钢等）材料。

**Workpieces:** Cast iron series (such as cold cast iron, nodular cast iron, grey cast iron, alloy cast iron) and steel series (such as 20Cr, GCr15, CF53, #45, #55, 80B).

**特点:** 具有加工效率高、精度高、不产生烧伤及表面退火变软现象，使用寿命长，易修整的特点。

**Features:** high efficiency and precision without burning and annealing, easy to dress and durability.

**适用设备 Machines:** Junker, Toyoda, Schaudt, 恒博、杰克、海捷等。

## 万向节砂轮

### Wheels for Universal Joint

砂轮形状 Shape: 1A8、1A8W

砂轮尺寸范围 Diameter:  $\Phi$  6-30mm

应用设备 Grinders: 德国 EX-CELL-O Xg692

Xg662、意大利 MECCANORA

应用范围: 主要应用于汽车零部件行业, 如等速万向节、星形套、钟形壳内外球道磨削, 保持架窗孔磨削等。

Applications: Mainly used in the field of Automobile, such as CV joint, Starlike Sleeve, Inner and outer race, Case, etc.

砂轮优点: 锋利性及形状保持性好, 具有较大的材料去除率, 可以使用一刀工艺完成全部球道磨削, 6个球道的磨削时间仅需60-80s, 大幅提高加工效率。砂轮的性能已达到国外进口砂轮水平。

Features: Good sharpening and shape holding, higher removal rate and efficiency, 6 races ground by only 60~80 seconds, the quality has reached level of imported ones.



## 加工轴承用砂轮

### Wheels for bearing

砂轮形状 Shapes: 1A8、1A8W、3A1、1A1

砂轮尺寸范围 Diameter:  $\Phi$  10-130mm

应用设备 Machines: 日本TOYO、YONGKE、德国Mikrosa、日本KOYO

应用范围: 轴承内径磨削、外沟道磨削、断面磨削等

Application: Inner diameter, out race and surfaces of bearing.

砂轮优点: 锋利性及形状保持性好, 具有较大的材料去除率, 散热性能好, 修正间隔可达到300台/修。加工精度高, 圆度、圆柱度、直线度 $\leq 2 \mu\text{m}$ , 精度一致性CPK值 $\geq 1.33$ , 可以在离散度要求高的产品中提高成品率。

Features: Good sharpening and shape holding, higher removal rate and efficiency, good heat dissipation, Dressing interval reaches to 300 pieces. roundness, cylindricity, straightness  $\leq 2 \mu\text{m}$ , CPK  $\geq 1.33$ . Can improve the yield in the dispersion demanding products.



## 压缩机行业CBN砂轮

### Vitrified CBN Wheels for Compressor Parts

陶瓷结合剂CBN砂轮广泛应用于空调压缩机部件的磨削加工, 如压缩机活塞、气缸、缸盖、轴承、齿轮等的加工, 砂轮具有开放的组织和良好的自锐性。同时, 这些砂轮也应用于汽车零部件等行业。

Vitrified CBN wheels are widely used in the compressor field for the grinding of pistons, cylinders, caps, bearings and gears, etc. The products have either a compact or porous structure and are self-sharpening. These particular wheels have also been used in various other industries including the automotive industry.

## 内圆磨砂轮

### Wheels For Internal Grinding

砂轮形状及规格 Shapes: 1A8、1A8W

砂轮尺寸范围 Diameter:  $\Phi$  10-60mm

应用设备 Grinders: 日本TOYO、YONGKE、德国Mikrosa、日本KOYO

应用范围: 压缩机活塞内圆磨削, 气缸内圆磨削, 缸盖、机架内圆磨削等

Application: Internal grinding of compressor pistons, cylinders, cylinder covers, cylinder frames, etc.

砂轮特点: 锋利性及形状保持性好, 具有较大的材料去除率, 散热性能好; 活塞加工节拍 $\leq 25\text{s}$ , 修整间隔40-120台/修; 缸盖加工节拍 $\leq 15\text{s}$ , 修整间隔50-300台/修; 机架加工节拍 $\leq 20\text{s}$ , 修整间隔50-300台/修; 气缸加工节拍 $\leq 15\text{s}$ , 修整间隔60-300台/修; 加工精度高, 圆度、圆柱度、直线度 $\leq 3 \mu\text{m}$

Features: Good sharpening and shape-retention, large material removal rate, good heat dispersion, accurate machining, adheres to tolerance of roundness, cylindricity and straightness  $\leq 3 \mu\text{m}$ . For piston grinding, cycle time is  $\leq 25\text{s}$ , dressing interval is 40~120 pieces; For cylinder cover grinding, cycle time is  $\leq 15\text{s}$ , dressing interval is 50~300 pieces; For cylinder frame grinding, cycle time is  $\leq 20\text{s}$ , dressing interval is 30~300 pieces; For cylinder grinding, cycle time is  $\leq 15\text{s}$ , dressing interval is 60~300 pieces.



## 外圆磨砂轮

### Wheels for cylindrical grinding

#### 偏心磨砂轮:

主要适用于压缩机偏心轮的磨削, 外径250mm, 钛合金基体。具有加工效率高、工件粗糙度好 (RZ1.2-2.4), 寿命长( $\geq 15000$ 件)的优点

#### Camshaft Grinding:

Shape: 1A1

Diameter: 250mm

Abrasive: CBN

Bond: Vitrified

Core: Titanium alloy

Feature: High grinding efficiency and precision (RZ1.2~2.4), durability ( $\geq 15000$  pieces).



#### 曲轴止推面砂轮:

主要适用于压缩机曲轴止推面的磨削, 外径400mm, 铝合金基体。具有自锐性好、精度高的优点

#### Crankshaft Grinding:

Shape: 4A9

Diameter: 400mm

Abrasive: CBN

Bond: Vitrified

Core: Aluminum alloy

Feature: High grinding efficiency and precision; self-sharpening.



## 双端面磨砂轮

### Double Grinding Discs

双端面磨金刚石/CBN砂轮, 用于平行度和平面度要求非常高的零部件的加工, 如轴承、齿轮、压缩机零部件、各类垫圈、油泵零件、汽车部件等, 适用于铜、铝、铸铁、塑料、粉末金属及各种钢材等各种材料的精密加工。

Used on bearing, gear, compressor, washer, oil pump, automobile parts, etc., that must have parallel and flat surface areas finished to critical tolerances. Almost any material can be ground in this fashion including: brass, aluminum, cast iron, plastic, powdered metal and steels.

**砂轮特点:** 两片砂轮同时使用, 双面加工, 磨削效率高, 工件精度高;

**Features:** Grinding by two sides simultaneously yields a high production rate reflecting great precision.

**外径 Diameter:** 350mm ~ 1200mm

**结合剂 Bonds:** 树脂 resin、陶瓷 vitrified.

#### 树脂双端面砂轮

##### Resin Bonded Double Grinding Discs

**砂轮形状 Shapes:** 6A2, 6A2T

**砂轮应用:** 可用于压缩机、液压机、磁性材料、汽车配件等核心配件的双端面高精度磨削加工

**Application:** Used on parts for compressors, hydraulic machines, magnetic materials, automobile parts, etc.

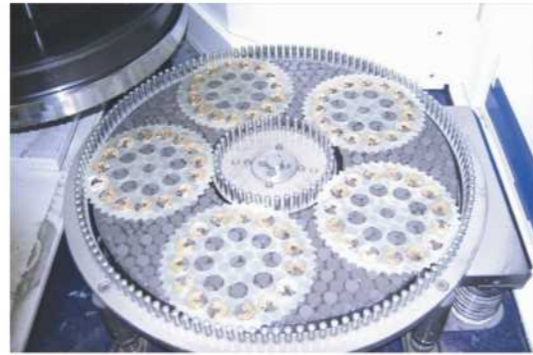
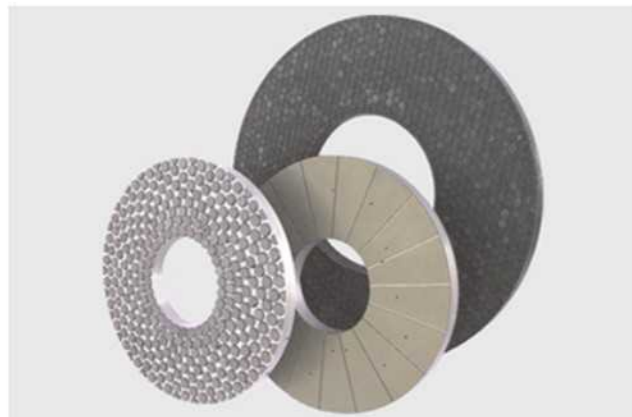
**砂轮特点:** 具有弹性好、强度高、耐冲击、不易堵塞、效率高、加工表面光泽度高、冷却效果好、不易烧伤等优点

**Features:** Free cutting, good elasticity, high efficiency without burning.

**被加工工件:** 精度高, 平面度 $\leq 2\text{btm}$ , 平行度 $\leq 3\text{btm}$ , 粗糙度 $Ra \leq 0.2\text{btm}$

**Workpiece:** High precision, Flatness  $\leq 2\text{btm}$ , Parallel to  $\leq 3\text{btm}$ , Roughness of  $Ra \leq 0.2\text{btm}$



**双端面刀粒砂轮****Double Grinding Wheels For Inserts****砂轮形状 Shapes:** 6A2, 6A2T**结合剂类型 Bond:** 树脂结合剂 Resin**工件材料:** 硬质合金、陶瓷、金属合金陶瓷**Workpieces:** Carbide, Ceramic, Alloy-ceramics.**加工设备 Grinders:** ATM, Melchiorre, Peter Wolters, Diskus, Viotto, Wendt.**冷却介质 Cool liquid:** 油, 乳化液, Oil, emulsion**陶瓷双端面砂轮****Vitrified Double Grinding Discs****砂轮应用:** 硬质合金、陶瓷、金属陶瓷等, 如压缩机活塞断面磨削, 中间板断面磨削, 滑片断面磨削, 液压件断面磨削等**Application:** Used for parts made of carbide, ceramics, metal-ceramics, etc. Examples include, compressor pistons, vane slits, and hydraulic parts.**砂轮特点:** 锋利性好, 修整间隔长, 寿命长, 磨削效率高等。同普通磨料双端砂轮相比, 陶瓷CBN双端砂轮的寿命可以提高20-100倍, 修整间隔是普通磨料砂轮的10倍以上。加工精度高, 工件尺寸的一致性, 精度一致性CPK值 $\geq 1.33$ , 可以在离散度要求高的产品中提高成品率。**Features:** Good sharpening, long dressing interval, long life and high efficiency.**砂轮尺寸范围 Diameter:**  $\Phi 500-1020\text{mm}$ (目前成功应用的双端面砂轮规格有 $\Phi 700$ 、 $\Phi 840$ 、 $\Phi 1020\text{mm}$ )。**应用设备:** 德国Peter Wolters双端磨床、韩国AM双端磨床, 瑞士STAHLI双端磨床**Machines:** Peter Wolters, AM, STAHLI.**用于切断的金刚石、CBN砂轮****Diamond/CBN Wheels for Cutting**

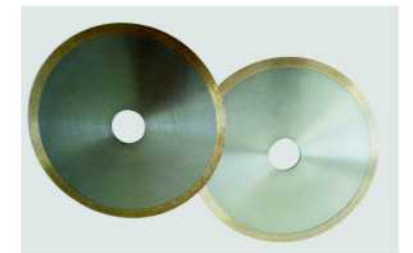
金刚石和CBN切割砂轮, 主要用于石英、玻璃、LED、硬质合金、复合材料、陶瓷以及高速钢、合金钢等材料的切割加工。分为树脂结合剂和金属结合剂两种。

**金刚石切割砂轮特点:** 适用于非金属材料及非铁族金属材料的切割加工;**CBN切割砂轮特点:** 适用于含铁金属材料、合金材料及复合材料的切割加工;**树脂结合剂切割砂轮特点:** 切割锋利, 效率高。**金属结合剂切割砂轮特点:** 强度高、刚性好、使用寿命长;

There are two kinds of cutting wheels - diamond and CBN - with two different types of bonds - resin bond and metal bond.

Diamond cutting wheels are suitable for the cutting of tungsten carbide, quartz, glass, LED, ceramic, etc., with the characteristics of free cutting and high efficiency.

CBN cutting wheels are suitable for the cutting of HSS, alloy steel, composite materials, etc., with the characteristics of high strength, good rigidity and long life.

**树脂结合剂金刚石/CBN切割砂轮****Resin Bonded Diamond/CBN Cutting Wheels****型号 Types:** 1A8, 1A1R**外径 Diameter:** 40mm ~ 400mm**薄度 Thickness:** 最薄可做到0.05mm; thinnest 0.05mm.**金属结合剂金刚石或CBN切割砂轮****Metal Bonded Diamond/CBN Cutting Wheels****型号 Types:** 1A8, 1A1R**外径 Diameter:** 40mm ~ 200mm**薄度 Thickness:** 最薄可做到0.3mm; thinnest 0.3mm.**金属结合剂组合砂轮****Group Cutting Wheels**

超薄超精, 良好的刚性和精密度, 可用于深度切割和强力切割。

Metal bonded diamond wheels are ultra thin and precise for group application. Excellent rigidity and accuracy for strong deep cutting.



## 半导体、光电行业砂轮

### Diamond Wheels for Semiconductors and Pvs



#### 硅片减薄砂轮

##### Shining Wheels

陶瓷结合剂金刚石砂轮，用于硅片减薄及蓝宝石晶片等的磨削加工。特点：砂轮锋利性好、加工效率高、耐用度高、使用寿命长、工件的平行度与平面度稳定性好。

Vitrified diamond wheels for the thinning and finishing of silicon wafer and sapphire. Quality stability and free cutting.

**砂轮形状 Types:** 6A2, 6A2T。

**砂轮特点:** 砂轮锋利性好，磨削效率高，被加工工件表面纹路一致，无崩边、划伤现象。性价比高，能替代进口产品。

**Features:** Sharpening, high efficiency and precision without chipping and scratching. A reasonably priced substitute for imported wheels.

**配套机床 For the Machines:** SHUWA SGM-6301, NTS Nano Surface-180G, NTS Nanosurface 250/NC-VDM, WEC

**磨料种类 Abrasive:** 金刚石 Diamond

**结合剂 Bond:** 陶瓷结合剂 Vitrified.

#### 硅片倒角砂轮

##### Chamfering of wafers

**砂轮形状 Type:** 6A2

**砂轮特点:** 砂轮锋利性好，形状保持性优越，加工后的工件表面粗糙度低，工件无划伤、崩边现象。

**Features:** Free cutting, High precision, No chipping or scratching.

**结合剂 Bond:** 树脂结合剂 Resin



#### 切断砂轮

##### Cut Off Wheels

超薄超精切割刀片，树脂结合剂、金属结合剂和电铸结合剂，用于硅片、磁头、IC、LSI、复合材料、光学纤维等的精密切割加工

Diamond/CBN blades- resin bonded, metal bonded and electroplated for the precision cutting of wafers, magnetic heads, IC, LSI, optical fibers, etc., Resin, metal and electro-plated bonds.



**磨边砂轮****Edging Wheels**

**主要特点:** 砂轮槽型一致性高, 互换性好、加工精度高、锋利性好, 使用寿命长, 噪音小, 可以保证被加工产品的尺寸要求, 不崩边、不崩角

**Features:** Good durability. Interchangeable with high precision. Less noisy with no chipping.

**应用范围:** 主要用于各种玻璃及制品的磨边加工, 包括普通玻璃、微晶玻璃、光伏玻璃、PDP玻璃、LCD。

**Applications:** For the grinding of all types of glass- such as general glass, micro-crystalline glass, PV glass, DPD and LCD.

**结合剂 Bond:** 金属结合剂 Metal

**抛光砂轮****Polishing Wheels**

**砂轮形状 Type:** 6A2

**特点:** 砂轮磨削效率高, 被加工工件表面品质优, 表面光亮度优。砂轮最细能够达10000#。

**Features:** High efficiency with high precision. Grits up to #10000.

**磨料种类 Abrasive:** 金刚石 Diamond

**结合剂 Bond:** 树脂结合剂 Resin



## 金刚石和CBN砂轮使用速度推荐 (一般应用)

### Recommended Wheel Speeds for Diamond and CBN Wheels (using general applications)

湿磨 Wet Grinding		
金刚石砂轮 DIAMOND WHEELS	杯、碗形砂轮 CUP WHEELS	外圆砂轮 PERIPHERAL WHEELS
砂轮形状 Diamond Wheel shapes	11V9, 12V9, 15V9, etc.	1A1, 1V1, 1A1R, etc.
树脂结合剂砂轮 Resin Bond Wheels	25 to 40 m/s	25 to 40 m/s
金属结合剂砂轮 Metal Bond Wheels		20 to 30 m/s
陶瓷结合剂砂轮 Vitrified Bond Wheels	15 to 30 m/s	15 to 30 m/s
干磨 Dry Grinding		
CBN砂轮 CBN WHEELS	杯、碗形砂轮 CUP WHEELS	外圆砂轮 PERIPHERAL WHEELS
Resin Bond Wheels	30 to 50 m/s	30 to 50 m/s
金刚石砂轮 DIAMOND WHEELS	杯、碗形砂轮 CUP WHEELS	外圆砂轮 PERIPHERAL WHEELS
砂轮形状 Diamond Wheel shapes	11V9, 12V9, 15V9, etc.	1A1, 1V1, 1A1R, etc.
树脂结合剂砂轮 Resin Bond Wheels	14 to 18 m/s	14 to 18 m/s
CBN砂轮 CBN WHEELS	15 to 30 m/s	15 to 30 m/s

## 不同国家金刚石粒度对照表 Diamond Grits Comparison Chart

Synthetic Diamond Grain Mesh Size Comparison Chart												
International Standard			FEPA		USA		JAPAN		Theoretical Basic Size		RUSSIA	
ISO					ANSI B74.16-1971		JIS4130-1998				9206-80	
Grain No.	Grain No.	Grain Size	Grain No.	Grain Size	Grain No.	Grain Size	Grain No.	Grain Size	Inch	Millimeter	Grain No.	Grain Size
427	40/50	425/300	B/427	355/300	40/50	425/300	40/50	425/300	0.015	0.378	500/400	500/400
301	50/60	300/250	B/301	300/250	50/60	300/250	50/60	300/250	0.011	0.288	400/315	400/315
252	60/80	250/180	B/252	250/180	60/80	250/180	60/80	250/180	0.009	0.226	250/200	250/200
181	80/100	180/150	B/181	180/150	80/100	180/150	80/100	180/150	0.0069	0.174	200/160	200/160
151	100/120	150/125	B/151	150/125	100/120	150/125	100/120	150/125	0.0058	0.148	160/125	160/125
126	120/140	125/106	B/126	125/106	120/140	125/106	120/140	125/106	0.0048	0.123	125/100	125/100
107	140/170	106/90	B/107	106/90	140/170	106/90	140/170	106/90	0.0041	0.103	100/80	100/80
91	170/200	90/75	B/91	90/75	170/200	90/75	170/200	90/75	0.0034	0.866	80/63	80/63
76	200/230	75/63	B/76	75/63	200/230	75/63	200/230	75/63	0.0030	0.075	63/50	63/50
64	230/270	63/53	B/64	63/53	230/270	63/53	230/270	63/53	0.0026	0.066	50/40	50/40
54	270/325	53/45	B/54	53/45	270/325	53/45	270/325	53/45	0.0022	0.057		
46	325/400	45/38	B/46	45/38	325/400	45/38	325/400	45/38	0.0019	0.048		

## 砂轮转速换算表 Conversion between M/S and RPM

砂轮直径 Diameter		线速度 Speed (M/S)								
		15	20	25	30	35	40	45	60	80
寸inch	毫米mm	每分钟转数 RPM								
1"	25	11500	15300	19100	23000	26750	30550	34370	45840	61000
1 1/2"	40	71600	9550	11940	14320	16700	19100	21500	28700	38200
2"	50	5730	7650	9550	11450	13400	15275	17185	22900	30500
2 1/2"	65	4400	5900	7350	8800	10300	11750	13200	17600	23500
3"	75	3825	5100	6380	7650	9000	10185	11455	15300	20400
3 1/2"	90	3185	4245	5300	6370	7430	8490	9560	12750	17000
4"	100	2865	3825	4775	5730	6700	7640	8600	11450	15300
4 1/2"	115	2490	3320	4150	4980	5815	6640	7470	9965	13300
5"	125	2300	3035	3800	4600	5300	6110	6875	9200	12200
6"	150	1900	2550	3200	3800	4450	5100	5730	7640	10200
7"	175	1635	2200	2730	3270	3800	4365	4910	6550	8950
8"	200	1440	1910	2390	2875	3350	3820	4300	5730	7640
9"	225	1275	1700	2100	2550	2975	3395	3820	5100	6840
10"	250	1150	1525	1900	2300	2675	3050	3440	4575	6100
12"	300	950	1275	1590	1900	2230	2550	2865	3820	5100
14"	350	820	1090	1370	1640	1900	2180	2450	3275	4360
16"	400	725	960	1200	1450	1675	1910	2150	2870	3820
18"	450	635	850	1060	1275	1485	1700	1910	2550	3400
20"	500	575	770	960	1150	1340	1525	1720	2290	3050
22"	550	515	700	850	1030	1200	1390	1565	2080	
24"	600	475	640	800	950	1110	1295	1430	1910	
26"	650	440	590	730	875	1030	1175	1320	1750	
28"	700	405	540	675	810	950	1090	1225	1640	
30"	750	380	510	635	765	890	1020	1145	1530	
32"	800	360	475	600	715	835	955	1075	1435	
34"	850	340	450	565	675	790	900	1010		
36"	900	320	425	530	640	750	850	955		
38"	950	300	400	500	600	700	805	905		
40"	1000	285	380	480	570	670	765	860		
42"	1050	275	365	455	550	640				
44"	1100	260	350	430	520	600				