Company Profile

GH Diamond Tools Co., LTD is the manufacturer specialized in producing Diamond and CBN tools, which not only creates a good brand of producing various Diamonds,CBN tools and cutters but also does product investigation base on customers' requirements.

We have introduced lots of from advanced production equipments and technologies Switzerland, Germany and Japan, design and produce every tool on the basis of scientific management and ISO international standards, We develop high producing technique and inspecting technique to guarantee the quality,

Our company has established long-term cooperation with buyers in Japan, Germany, Spain, Italy, Canada, the United States, Australia, South Africa and other countries, and has maintained good business relations,

With high quality products at reasonable prices, we sincerely hope to set up close relationships with customers from all over the world. We look forward to cooperate with foreign customers and establish win&win business relationship together.

Contents

Products

Introduction to Superabrasive Materials

Superabrasive Materials

There are many different types of tip available in the market designed to cope with an array of work piece materials but for simplicity these may be grouped as follows:-

- Polycrystalline Diamond (PCD).
- Polycrystalline Cubic Boron Nitride (PCBN) for rough machining.
- Polycrystalline Cubic Boron Nitride (PCBN) for finish machining.
- CVD Diamond

Tools with PCD and CBN cutting edges are the ideal solution for difficult-to machine, highly abrasive materials. These tools achieve highest quality and economic efficiency. The result: Long tool life, highest surface quality, optimal process reliability and repeat-ability.

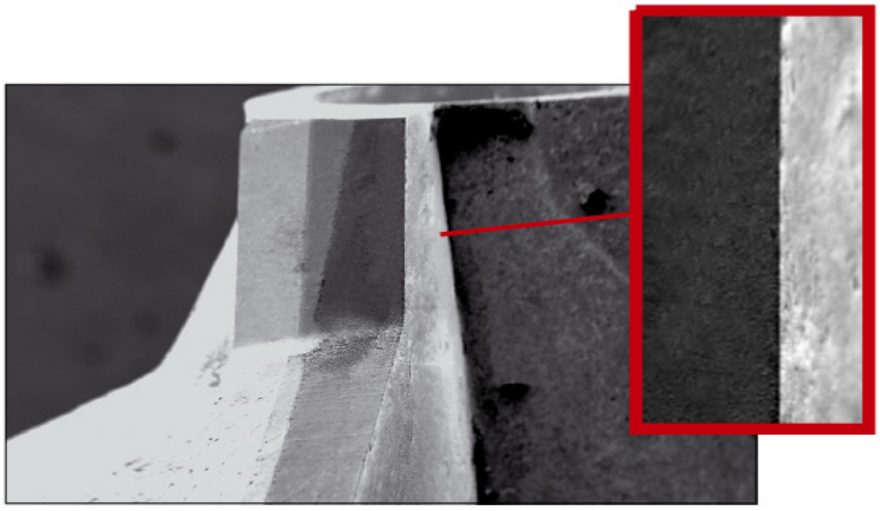


Fig. 1: PCD-tool
Convincing, wear-resistant diamond cutting edge

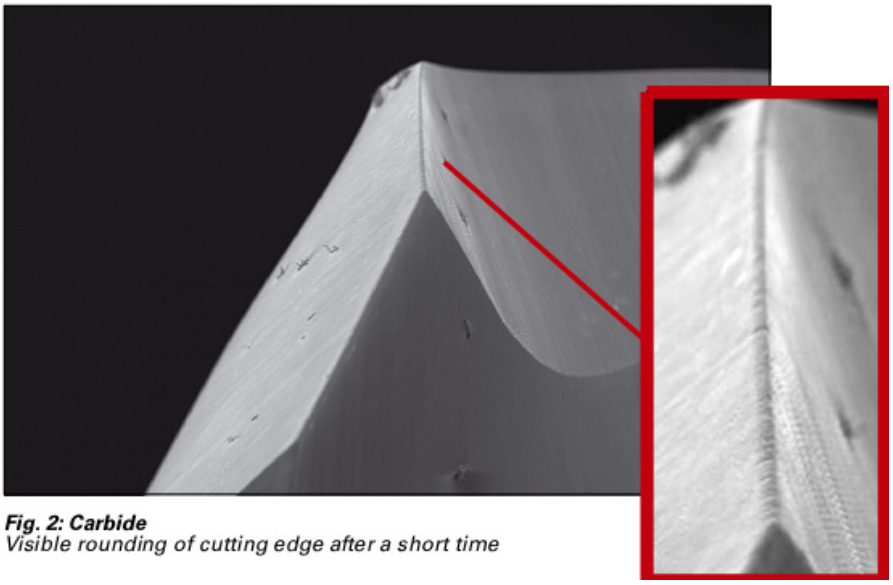


Fig. 2: Carbide
Visible rounding of cutting edge after a short time

● PCD

PCD（**Polycrystalline Diamond**） is a synthesized, extremely tough, intergroup mass of randomly orientated diamond particles in a metal matrix. It is produced by sintering together selected diamond particles at high pressure and temperature.

PCD may be cost effectively employed to machine the following broad range of materials:

- Non-ferrous metals and alloys including, aluminum, copper, bronze, brass, green tungsten carbide, precious metals and MMC's.
- Non-metallic materials including, ceramics, reinforced plastics, hard rubber, chipboard, MDF's and other fibreboards, etc.

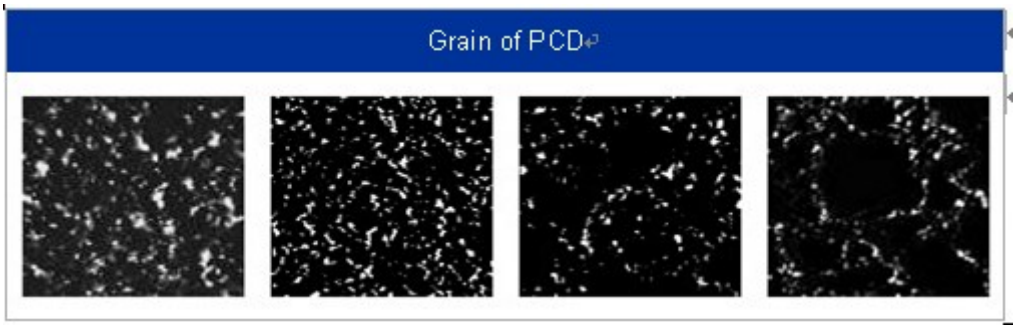
PCD may be used for both roughing and finishing work, although it is usually most beneficial when tight tolerances or high surface finishes are required combined with the need for exceptionally long tool life. Under the same machining environment, the life of PCD tools outperform that of tungsten carbide by 50~100 times. The range of its application is very extensive such as turning, milling, shaving, drilling, reaming and boring. It is available in three grades of increasing crystal size and toughness but with an attendant decrease of edge quality.

The finest grade is, therefore, only employed where superior surface finish is the main objective,

The middle grade is the general purpose material giving long life with good component finishes;

The coarse grade is used where maximum abrasive resistance is required and where finish is not critical, for example the machining of metal matrix composites.

GH will be pleased to offer advice on the selection of the best grade of PCD and cutting geometry for your particular application.

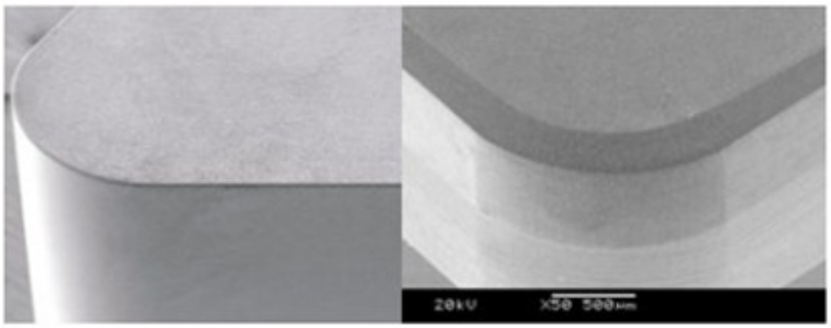


● PCBN

Polycrystalline cubic boron nitride (PCBN) is a synthesized mass of randomly orientated cubic boron nitride (CBN) particles, bound by a ceramic binder phase.

If polycrystalline diamond has a major disadvantage, it is that being carbon based, it has an affinity to the free carbon found in most ferrous materials and is therefore generally unsuitable for machining steels and iron based materials. For this reason a range of products has been developed based on polycrystalline cubic boronnitride which have been demonstrated to be extremely cost effective especially with the harder ferrous materials (45-65 HR). Examples of materials that may be considered for machining with these inserts are listed below:

- Hardened Steels
- Martensitic and Chill Cast Iron
- Hardened Bearing and Cold Work Tool Steels
- Martensitic Stainless Steels
- Hard Facing Alloys which are Cobalt, Nickel and Iron based
- Pearlitic Grey Cast Iron



PCBN cutting edge

The high-content PCBN grade is particularly suited for machining cast irons, hardened steels, rollers, low carbon steels, etc. Its hot hardness and wear resistance are excellent, whereas it has extremely high shock resistance.

The high CBN content PCBN material with coarse grain structure. It displays remarkable wear resistance and toughness, which makes this product an ideal solution for cast iron machining applications.

The medium to high CBN content PCBN material, and it contains a proprietary mix of micron CBN particles. it is recommended to process various hardened steels.

The low CBN content PCBN material with fine grain structure, and it is an excellent choice for machining hardened steels. This grade has very good combination of wear resistance and hot-hardness.

● PCBN For Rough Machining

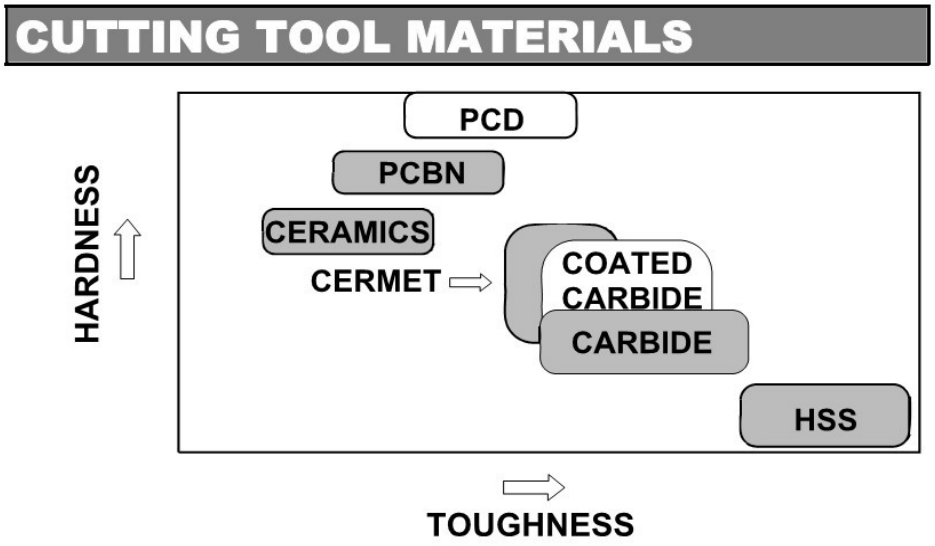
Different types of PCBN exist for the rough machining of the materials listed above which are usually selected on the basis of there quired amount of stock removal.

For roughing cuts in excess of 1mm depth the PCBN is usually supplied in the form of solid ISO tips for use in a clamp type tool holder, designed for use with negative top rake geometry. It is also usual to provide a strengthened cutting edge by means of a lapped or honed 'T' land.

Where roughing cuts up to 1mm only are to be taken or when the applications require positive tool geometry, bras able type of PCBN may be employed. In these cases the inserts are fabricated in a similar manner to diamond tips but usually with a polished 'T'land.

● PCBN for Finishing

A specific form of PCBN with reduced CBN content is supplied for use on fine finishing of hard ferrous materials. This material is capable, given the correct machining parameters, of producing turned finishes equal to those of ground components. The attendant cost savings found from switching from grinding to turning are often very dramatic. Again, the inserts are fabricated in a similar manner to those in PCD



● CVD

Chemical vapor deposition (**CVD**) diamond is a polycrystalline diamond material synthesized under the process of chemical vapor deposition.

CVD diamond has been vastly applied in mechanical, thermal and optical applications, while typical products include cutting tools, dressing tools, wire dies, wear parts, heat sinks, optical windows and so on..

We currently supply kinds of CVD diamond tools.

PCD Recommended Cutting Condition			
Work piece	Cutting Speed	Depth of Cut	Feed Rate
	(m/min)	(mm)	(mm/rev)
Aluminum(5~8% SI)	350~1600	0.05~2.50	0.10~0.40
Aluminum(8~12% SI)	350~1300	0.05~2.50	0.10~0.40
Aluminum(14~18% SI)	160~800	0.05~2.50	0.05~0.25
Copper	350~1000	0.15~2.50	0.05~0.20
Sintered Carbide	15~25	0.05~0.60	0.10~0.20
Glass Fiber	100~800	0.15~0.50	0.03~0.25
Carbon	160~700	0.15~2.50	0.15~0.40
High Aluminum	70~250	0.05~1.50	0.03~0.15
Ceramics			
Wood	1000-2500	0.2~5.0	010~0.50

PCBN Recommended Cutting Condition				
Work piece	Cutting method	Cutting speed	Feed	Depth of cut
		(m/min)	Turning (mm/rev)	(mm)
			Milling (mm/tooth)	
Gray cast iron	Turning	400~1000	0.15~0.40	0.12~2.00
(180~230HB)	Milling	400~1000	0.15~0.30	0.20~2.00
Chilled cast iron	Turning	75~150	0.15~0.30	0.12~2.00
(400HB)	Milling	120~240	0.15~0.30	0.20~2.00
Hardened steel	Rough turning	60~140	0.15~0.40	0.70~2.50
(>HRC 45)	Finish turning	100~140	0.10~0.20	0.12~0.75
	Milling	120~240	0.10~0.25	0.12~1.00
Supper alloy	Turning	100~240	0.05~0.30	0.10~2.50
(HRC35)	Milling	100~240	0.10~0.40	0.10~1.00
Sintered metal	Turning	90~180	0.05~0.20	0.10~1.00
	Milling	100~240	0.05~0.20	0.10~1.00
DCI roll, HSS roll	Turning	45~60	0.60~0.80	2.00~4.00

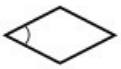
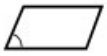
● Insert Shape

GH follows the normal ISO convention for describing insert shape and geometry：

PCBN刀具可选参数

T	P	G	W	12	04	08	N	T	3	1	-2
（表1）	（表2）	（表3）	（表4）	（表5）	（表6）	（表7）	（表8）	（表9）	（表10）	（表11）	（表12）

（表1） 刀片形状 Insert shape

代号	H	O	P	S	T	C	D	E	F	M	V	W	L	A	B	K	R
形状	正六边形	正八边形	正五边形	正方形	正三角形	菱形						六边形	长方形	平行四边形			圆形
刀尖角	120°	135°	108°	90°	60°	80°	55°	75°	50°	86°	35°	80°	90°	85°	82°	55°	
图形																	

（表2）主切削刃后角 Major cutting edge clearance angle

（表3）公差 Tolerances

级别符号 Letter Symbol	公差 Tolerances in mm		
	m(刀尖高) Height of tool tip	S(厚度) Thickness	d（内切圆直径）Diameter of inscribed circle
A	±0.005	±0.025	± 0.025
F	±0.005	±0.025	± 0.013
C	±0.013	±0.025	± 0.025
H	±0.013	±0.025	± 0.013
E	±0.025	±0.025	± 0.025
G	±0.025	±0.13	± 0.025
J	±0.005	±0.13	± 0.05 ± 0.13
K	±0.013	±0.025	± 0.05 ± 0.13
L	±0.025	±0.025	± 0.05 ± 0.13
M	±0.08 ±0.18	±0.13	± 0.05 ± 0.13
N	±0.08 ±0.18	±0.025	± 0.05 ± 0.13
U	±0.13 ±0.38	±0.13	± 0.08 ± 0.25

（参考m级精度按形状，尺寸分类之明细）

(refer to grade m precision according to the detail of shape and shape dimension)

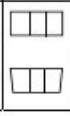
刀尖高公差Tolerance of nose height

内切圆直径 Diameter of inscribed circle	三角 Triangle	四方 Quadrangle	80° 菱形 80°Diamond shape	55° 菱形 55°Diamond shape	35° 菱形 35°Diamond shape	圆形 Circularity
6.35	±0.08	±0.08	±0.08	±0.11	—	—
9.525	±0.08	±0.08	±0.08	±0.11	±0.13	
12.70	±0.13	±0.13	±0.13	±0.15		
15.875	±0.15	±0.15	±0.15	±0.18		
19.05	±0.15	±0.15	±0.15	±0.18		
25.40	±0.18	±0.18	±0.18			
31.75	—	±0.25				

内切圆直径公差Diameter tolerance of inscribed circle

内切圆直径 Diameter of inscribed circle	三角 Triangle	四方 Quadrangle	80° 菱形 80°Diamond shape	55° 菱形 55°Diamond shape	35° 菱形 35°Diamond shape	圆形 Circularity
6.35	±0.05	±0.05	±0.05	±0.05	—	—
9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
12.70	±0.08	±0.08	±0.08	±0.08	—	±0.08
15.875	±0.10	±0.10	±0.10	±0.10	—	±0.10
19.05	±0.10	±0.10	±0.10	±0.10		±0.10
25.40	±0.13	±0.13	±0.13	—	—	±0.10
31.75	—	±0.20	—	—	—	±0.12

（表4） 断屑槽及加固形式 Chipbreaker and /or fixing type

代号 Code number	N	R	F	A	M	G	W	T	Q	U	B	H	C	J	X
有无孔 bore has to have no	无 Have no			有 Have											—
孔的形状 bore's shape	—			圆柱孔 Cylinder bore			圆柱孔+单面 40°—60° Cylinder bore+One side		圆柱孔+双面 40°—60° Cylinder bore+Double		圆柱孔+单面 70°—90° Cylinder bore+One side		圆柱孔+双面 70°—90° Cylinder bore+Double		—
断屑槽 Chipbreaker	无 Have no	单面 One side	双面 Double	无 Have no	单面 One side	双面 Double	无 Have no	单面 One side	无 Have no	双面 Double	无 Have no	单面 One side	无 Have no	双面 Double	—
形状 Shape															

（表5） 切削刃长度 Cutting edge length

形状 Shape	记号 Mark	切刃长 Length of cutting edge	内切圆 Inscribed Circle	形状 Shape	记号 Mark	切刃长 Length of cutting edge	内切圆 Inscribed Circle	形状 Shape	记号 Mark	切刃长 Length of cutting edge	内切圆 Inscribed Circle
80° 菱形 80° Diamond shape 	06	6.4	6.35	55° 菱形 55° Diamond shape 	07	7.7	6.35	六角形 Hexagon 	03	3.8	5.56
	08	8.0	7.94		11	11.6	9.525		04	4.3	6.35
	09	9.7	9.525		15	15.5	12.70		05	5.4	7.94
	12	12.9	12.70		19	19.4	15.875		06	6.5	9.525
	16	16.1	15.875	35° 菱形 35° Diamond shape 	16	16.6	9.525		08	8.7	12.70
	19	19.3	19.05						10	10.9	15.875
正方形 Quadrate 	06	6.35	6.35	三角形 Triangle 	06	6.9	3.97	圆形 Circularity 	08	8.0	8.0
	07	7.94	7.94		08	8.2	4.76		10	10.0	10.0
	09	9.525	9.525		09	9.6	5.56		12	12.0	12.0
	12	12.7	12.70		11	11.0	6.35		12	12.7	12.70
	15	15.875	15.875		16	16.5	9.525		15	15.875	15.875
	19	19.05	19.05		22	22.0	12.70		16	16.0	16.0
	25	25.4	25.40		27	27.5	15.875		19	19.05	19.05
	31	31.75	31.75		33	33.0	19.05		25	25.0	25.0
									25	25.4	25.40

（表6） 厚度 Insert thickness

记号 Mark	厚度 Insert thickness, s mm	记号 Mark	厚度 Insert thickness, s mm
01	1.59	06	6.35
T1	1 98	T6	6 75
02	2 38	07	7 94
T2	2.78	09	9.52
03	3.18	T9	9.72
T3	3.97	11	11.11
04	4.76	12	12.70
T4	4.96		
05	5.56		
T5	5.95		

单位(Unit) mm 

（表7） 刀尖圆弧半径 Nose radius

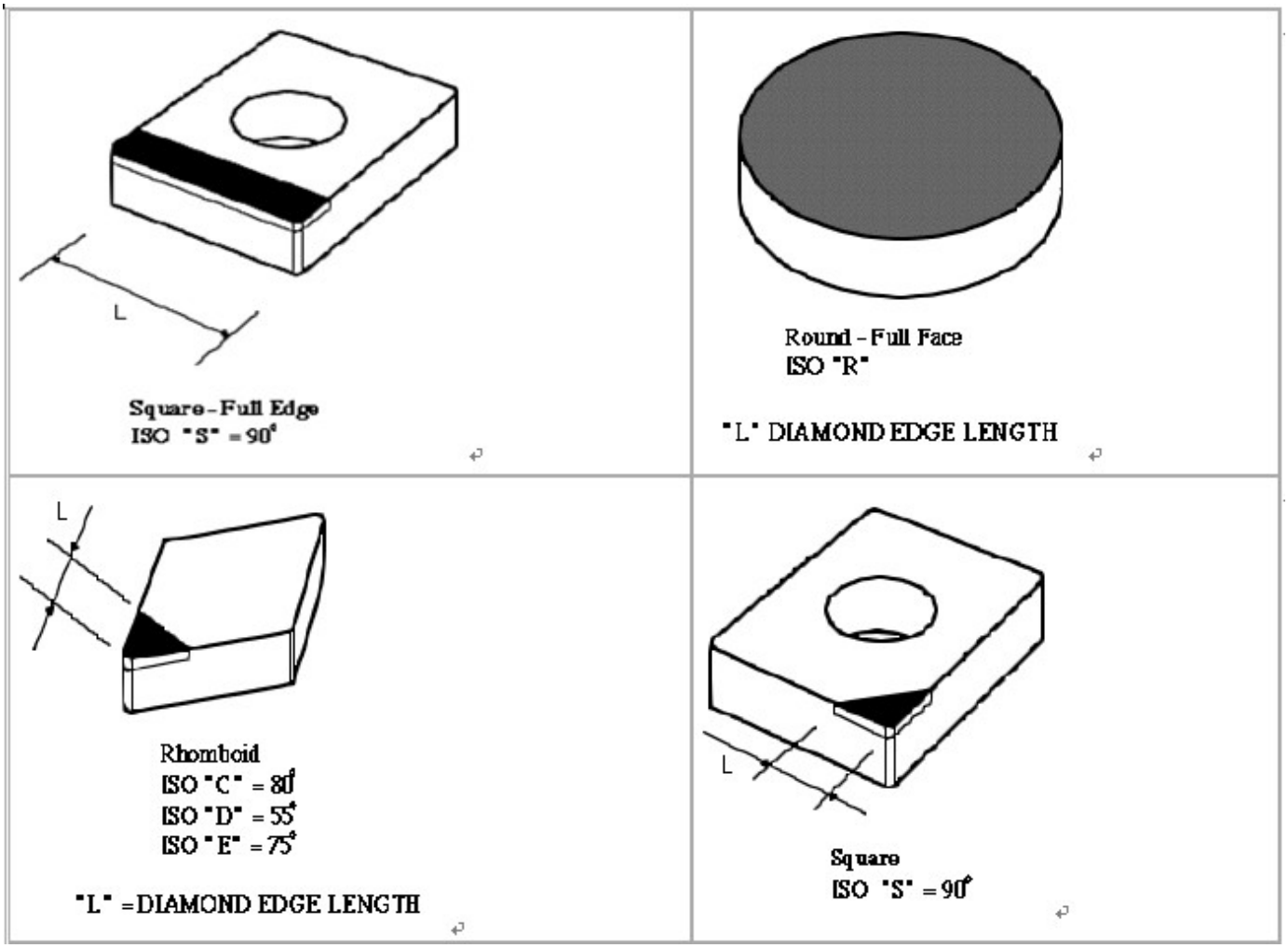
记号 Mark	刀尖 Tool tip
00	其他Other
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2 4
28	2.8
32	3.2

（表8） 方向 Direction

记号 Mark	方向 Direction
R	右手 Right hand
L	左手 Left hand
N	无 No

A full break down of insert nomenclature can be found in any insert manufacturers catalogue.

In addition to the insert description we need to know the size and position of the PCD/PCBN tip. The following illustrations detail some of the more common inserts and show the normal position of the abrasive layer. Where the abrasive length is not confined by the size of the insert, the edge length may be supplied to customers needs. Table 1 shows our standard range of products.



How to Order Tipped Inserts

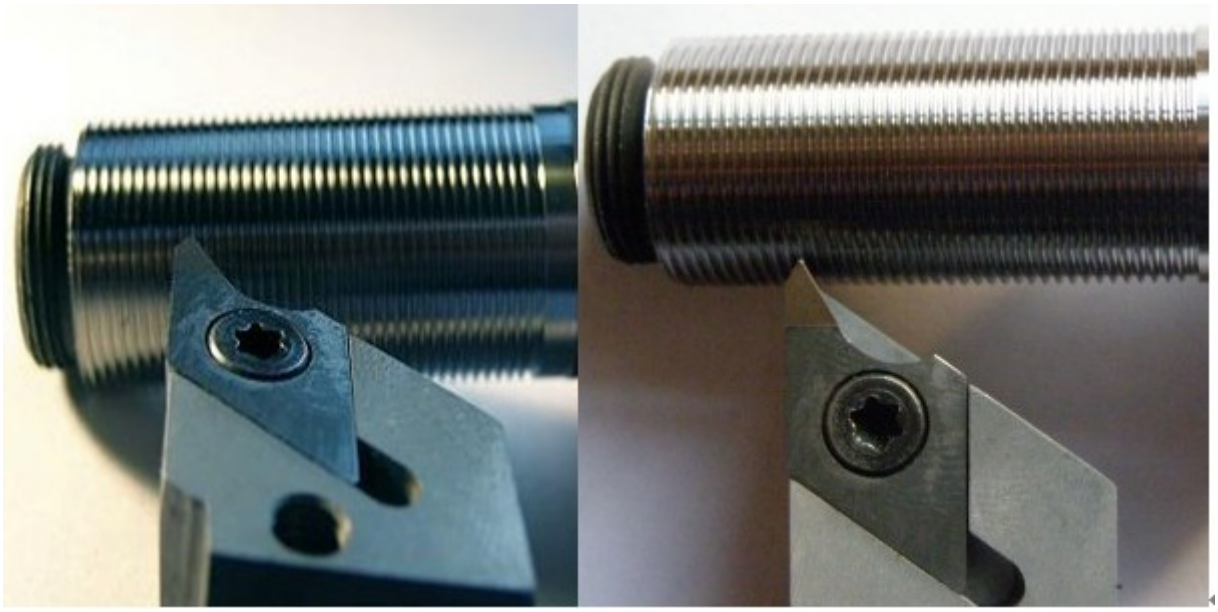
In order to specify the product you require we would need to have the following information:

1. The insert designation - ISO code (usually on the makers packaging).
2. The type of abrasive (Diamond or CBN).
3. Length of required PCD/PCBN cutting edge,number of tips required.
4. Any special features e.g.: Top rake or radius different to the code etc.

In the event of all of the factors not being known, we are equally happy to work from first principals and then we would need you to specify details such as:

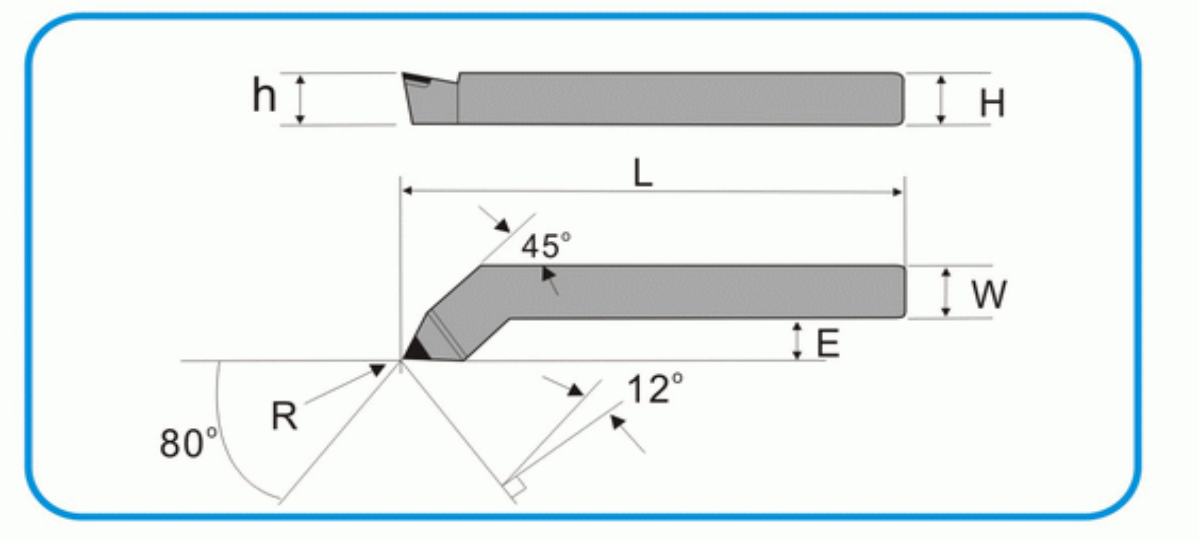
1. The material to be machined.
2. A used sample of the insert currently being employed.
3. In the case of a milling cutter the number of tips required.
4. Component drawings if available or details of stock to be removed, smallest radii to be machined, etc
5. Details of the machine to be employed with speed and feed range available.

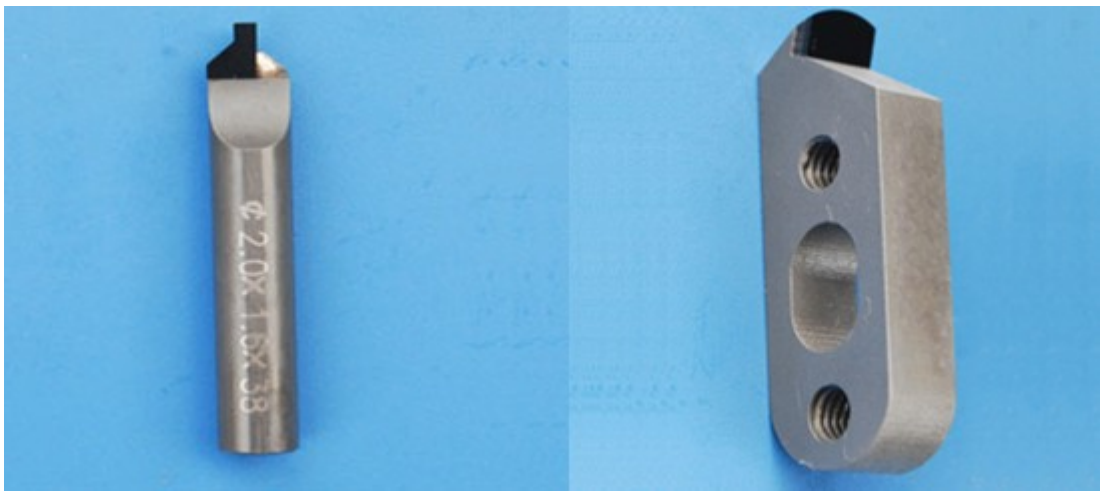
Should it be more convenient, we are always happy for our technical staff to assist in assessing the application and where necessary arranging for suitable trial tooling.



● Non-standard Cutting Tools

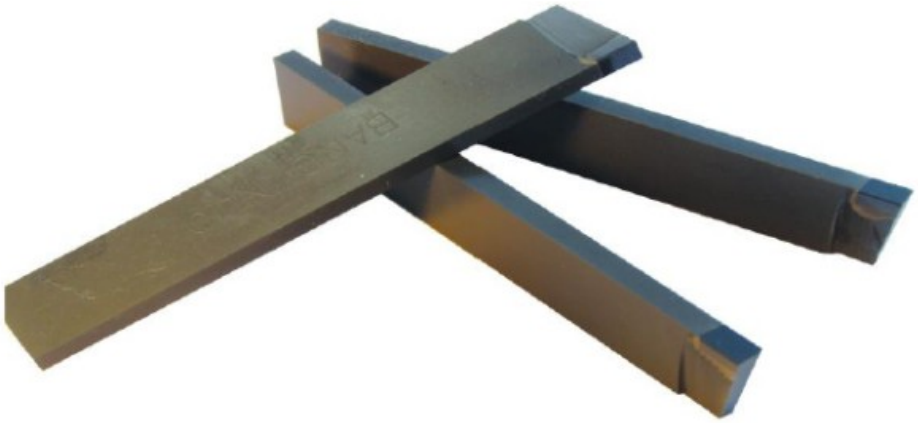
PCD& CBN -Turning and Milling Tools



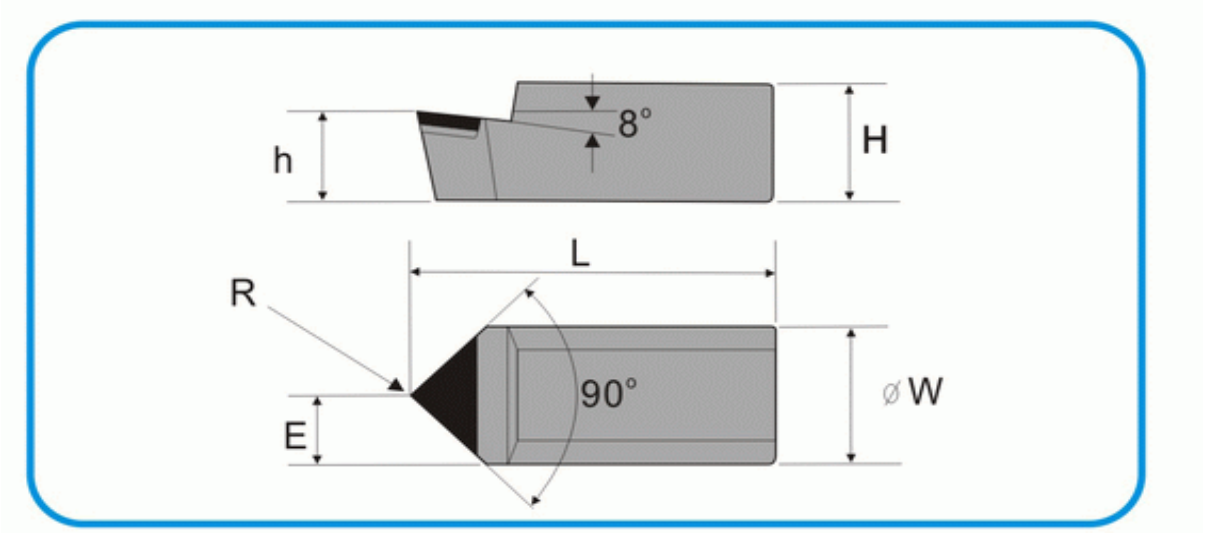


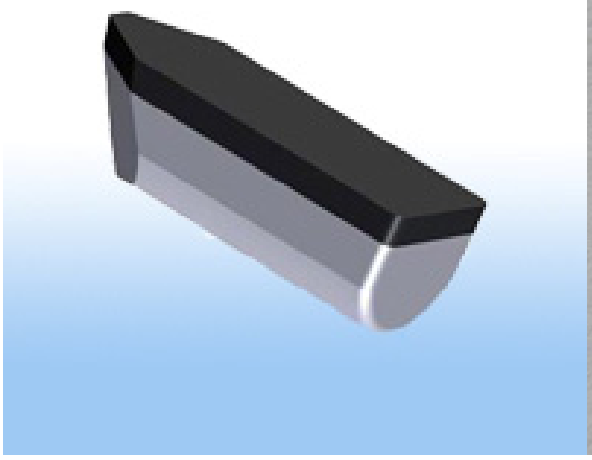
PCD & CBN Grooving Tools

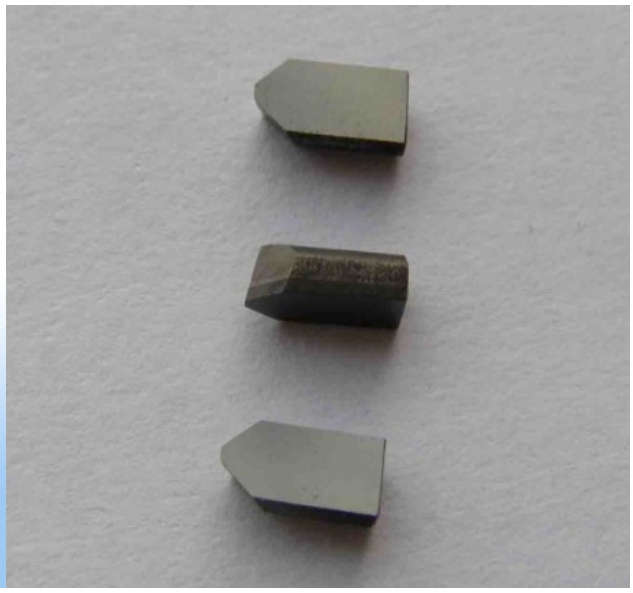
Our company could Supply Diamond and CBN grooving tools
Diamond grooving tools and profile turning tools with extremely high precision for manufactoring pistons. These tools are used mainly for the grooving of piston head rings.
For external grooving, groove turning, profiling and undercutting. Various PCD materials and CBN materials find application to the workpiece material.



PCD Boring Tools

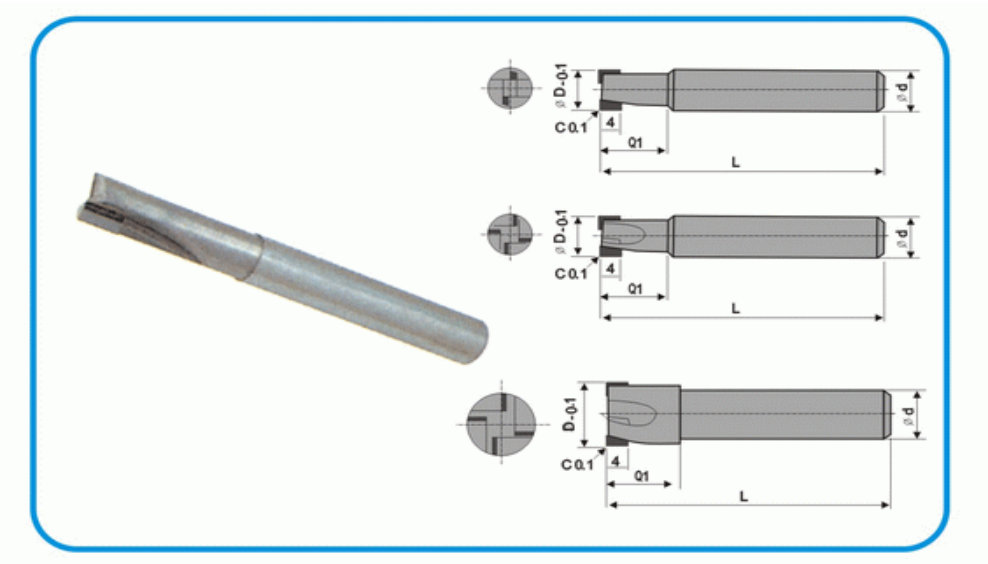






PCD Hub Cutter

PCD burnishing Drill



Diamond Dressers

We could supply an reange of single point diamond dressers and multipoint diamond dressers,that are useful various types of larger wheels, cylindrical & centreless grinders.The diamond dressers could be manufactured according to your specifications.

Diamond Engraving Cutters

This tool is popular for engraving and mark a wide range of materials. It may also be used for chamfering edges of workpieces.

Engrave and mark: aluminum, plastics, acrylic,PC,PET,Glass Fiber,Carbon Fiber,other kinds of Panel decoration components and Panels of Mobile,Mp3,Mp4. and more.

Acrylic Diamond Engraving Cutters extremely effective for reverse engraving acrylic and 3D engraving applications. We could produce the tools with many kinds of sizes.

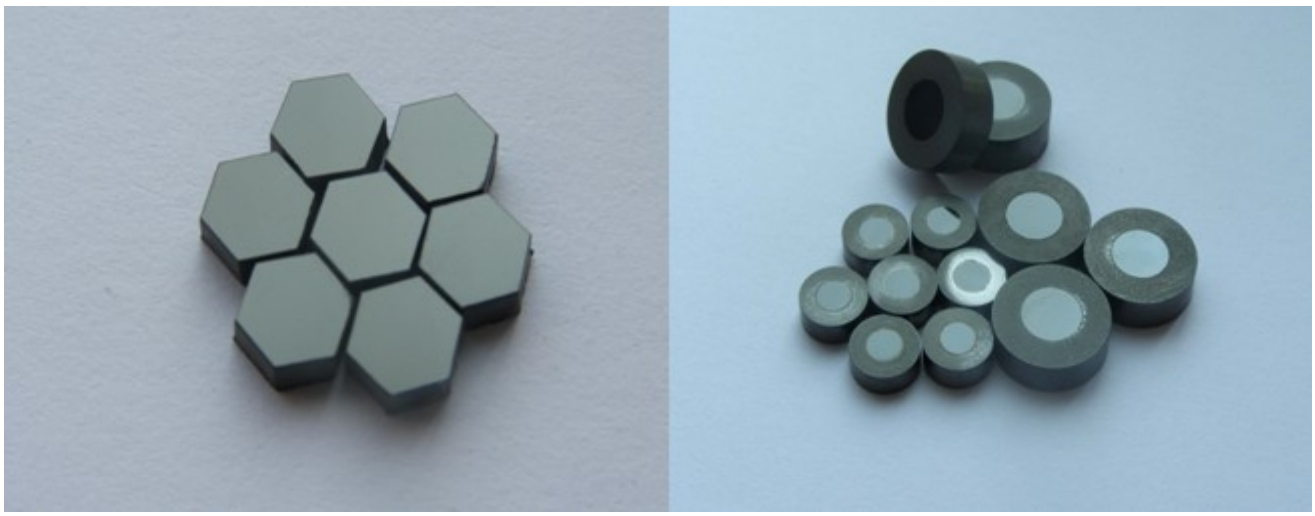
Diamond/PCD wire drawing die blanks

Our diamond wire drawing die blanks are polycrystalline diamond (PCD) products made under ultra-high temperature and ultra-high pressure, they are suitable for high-speed drawing of nonferrous wires such as bronze, aluminum, nickel, stainless steel and other alloy wires.

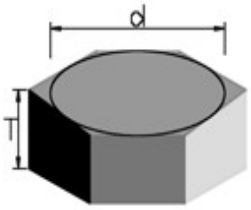
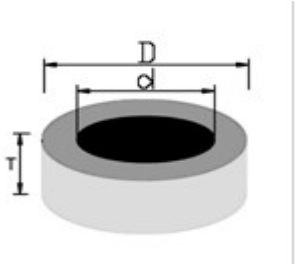
It is a better choice for wire drawing in a wide rang, such as for stainless steel, copper, tungsten, molybdenum, aluminum nickel, and etc.

They are available in 5 grades of grain size: 3 micron, 5 micron, 10 micron, 25 micron and 50 micron.D6 , D12 , D15 , D18 , D21 , D24 , D27, D30 , D36 or even bigger

Both standard and customer specified wire die blanks may be provided upon request, We provide a comprehensive range of Self-Supported Die Blanks (Hexagonal or Round) and Tungsten Carbide Supported Die Blanks (Round) PCD diamond die blanks that are highly sought after in the world market.



Specification For Diamond Wire Drawing Die Blanks

ADDMA Code	Product Dimension (mm)		Max.Die Recommended (mm)	Avg Grain Size (um)			
	Diamond Blank Diameter -D	Diamond Thickness-T					
Self-Supported Die Blanks(Hexagonal Or Round)							
D6	2.5	1.0	0.4	5	10	25	
D12	3.2	1.5	1.0	5	10	25	
D15	5.2	2.5	1.5	5	10	25	
D18	5.2	3.5	2.0	5	10	25	
D21	8.0	4.0	3.0	5	10	25	
D24	9.8	5.3	4.0	5	10	25	
Tungsten Carbide Supported Die Blanks(Round)							
D12	2.5	1.5	1.0	5	10	25	
D15	4.0	2.3	1.8	5	10	25	
D18	4.0	2.9	2.3	5	10	25	
D21	7.0	4.0	3.5	5	10	25	
D24	7.0	5.3	4.6	5	10	25	

PCD Scribing Wheels

Diamond scribing wheel：
Widely used for the cutting of LCD glass.
Perfectly suitable to cut very thin or very thick glass.

Specifications Of Diamond Scribing Wheels AND Axle

Item	Series	Dimension And Tolerance (mm)					Scoring Depth (mm)	Remarks
		Outer Diameter	Hole	Thickness	Roundness	Fit Clearance		
Diamond Scribing Wheel	GSA	2.0-4.0	0.8	0.65	≤0.003	0.02-0.05	Ten to twenty percent of the glass' thickness	Applies to each kind of cutting machine
Application		**Mainly applied in cutting the TFT glass, with high wear resistance, toughness, high precision and long service life.**						
Diamond Scribing Wheel	GSB	2.0-4.0	0.8	0.65	≤0.003	0.02-0.05	Ten to twenty percent of the glass' thickness	Applies to each kind of cutting machine
Application		**Mainly applied in cutting CSTN, STN, TN, TFT, etc, while special glasses of high degree of hardness could also be cut by it.**						
Diamond Scribing Wheel	GSC	2.0-6.0	0.8&1.4	0.65&1.1			Ten to twenty percent of the glass' thickness	Applies to each kind of cutting machine
		Customer specified products may be provided upon request.						
Application		**The life is slightly inferior to the A series, a higher cutting force. The comprehensive performance to price ration and their cutting quality is obviously higher than alloy wheels, it is good for cutting float glass, auto glass and tile production line.**						
Diamond Axle	GZ	Diameter (mm)	Length (mm)			Shape		Applies to each kind of cutting machine
		0.8	4 & 6			Both ends chamfered or one end grinding cone		

Wheel Holders

GH wheel holders include two types of products, duplex bearing supported and bearingless, both of which could be provided in accordance with customers' specific requirements.

- **We can make tools in accordance with your or drawing or specifications**

- **We hope that we can build a mutually beneficial and win-win cooperation bridge , and seek common development with you!**

Specialty makes perfect……

GH Diamond tools Co.,Ltd

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