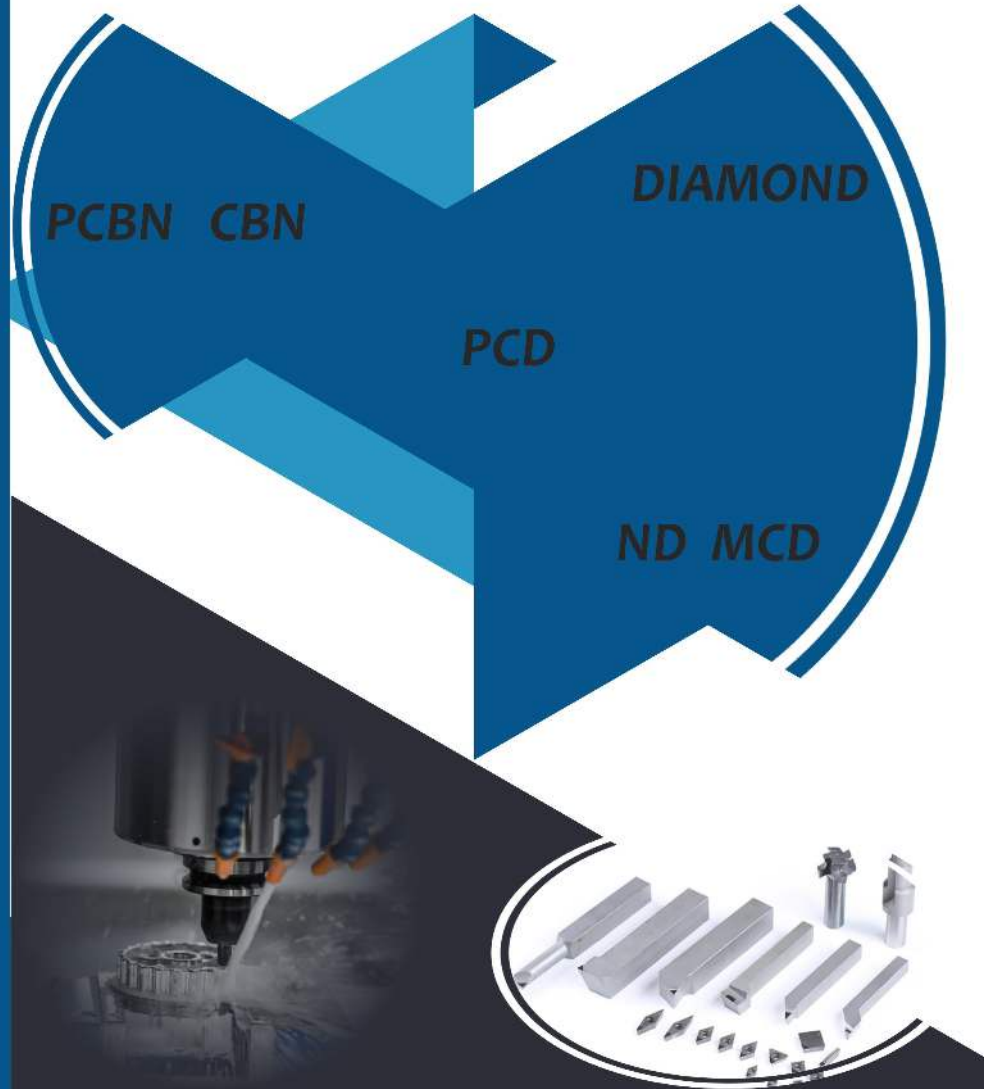




The image features a large world map with several circular callouts highlighting specific regions: South America, Europe, Africa, Asia, and Australia. Below the map, a diamond tool is shown in a precision grinding process, creating a fine mist of coolant. The background is a dark blue gradient.

*Company: Zhengzhou Zhong Yuan Super Hard Tools Co., Ltd.  
WhatsApp/Ph: 86-13526572721  
E-mail: info@zydiamondtools.com  
Address: AUX Industry, Shangjie District, Zhengzhou City,  
Henan Province, China.*



A large, stylized blue graphic with a white outline, containing the following labels: PCBN, CBN, DIAMOND, PCD, and ND MCD. Below the graphic, a diamond tool is shown in a precision grinding process, and a circular inset displays a collection of various diamond tool bits and inserts.

## ABOUT US

Zhengzhou Zhong Yuan Super Hard Tools Co., Ltd. was established in 2006, It is a high-tech enterprises that concentrates on scientific researching, producing and selling. We select high-quality imported raw materials (e.g. the blade material are selected from the U.S. GE Company or British DeBeers Company) and mainly produce super-hard cutting tools such as polycrystalline diamond PCD tools, polycrystalline cubic boron nitride PCBN cutting tools, and single crystal diamond SCD tools etc. Our products are widely used in automotive, aerospace, shipbuilding, rail transport, power generation, medical technology, electronic, military industry, machine and plant engineering, wood, clocks and watches, ceramics and parts processing areas which need high-precision and high surface finish.

After years of development, Founder Kevin Ray also have expanded the scale of grinding tools production and set up a medium-sized grinding wheel factory with ten engineers with 20 years of experience. We produce and use some abrasive wheels by ourselves, meanwhile also we become one shareholder of grinding wheel dressing machine (trimming machine), also build long and stable business relationship with some factory who manufacture related accessories, and choose more cost-effective accessories for customers when customers want to save time and cost.

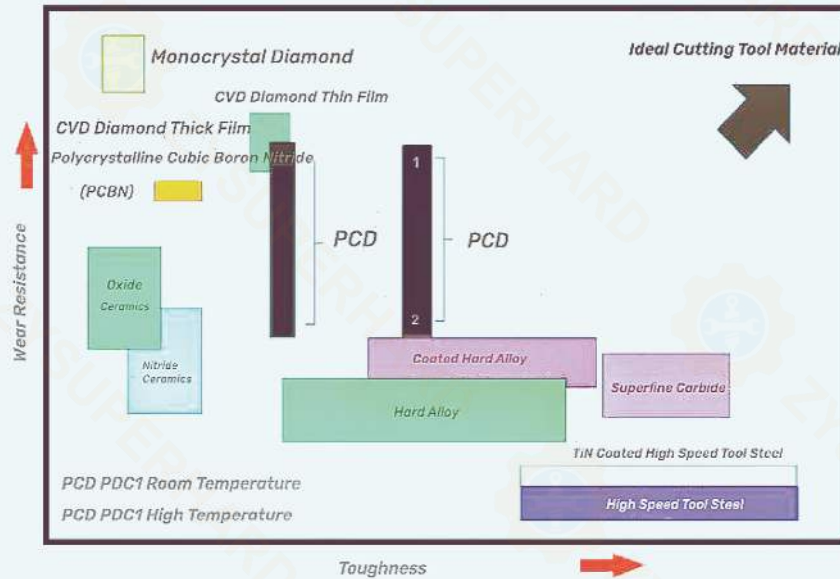
We have a strong and qualified technical force with a high-qualified team, a full set of imported producing equipment and high-precising testing apparatus. We can design and produce a variety of standard, non-standard and special super-hard tools according to the customers demand.

Our company adhere to "excellent credit", abide by "excellent quality," "keep excellent service", and determined to provide excellent products and dedicated service through our excellent brands. We sincerely welcome friends at home and abroad to discuss cooperation with us.



Comparison of different cutting tools

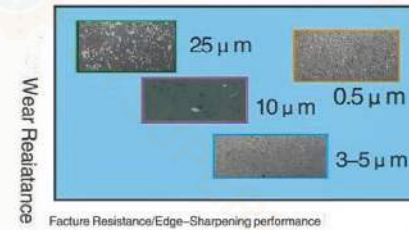
Performance Diagram Of Cutting Tool Material



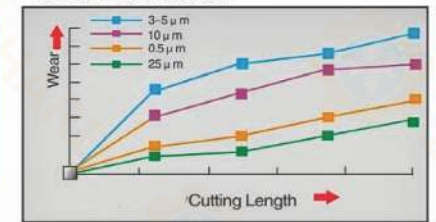
Performance Rating Sheet For Various Superhard Tool Materials

Types Properties	PCD Compact	CVD Diamond	Monocrystal Diamond	PCBN Compact
Wear Resistance	Good	Good +	Excellent	Good -
Toughness	Excellent	Good	Good -	Good
Thermochemical Stability	Good -	Good	Good	Excellent
Machinability	Excellent	Good	Good -	Excellent
Edge Quality	Good	Good +	Excellent	Good

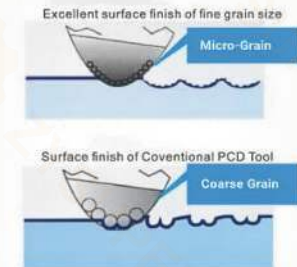
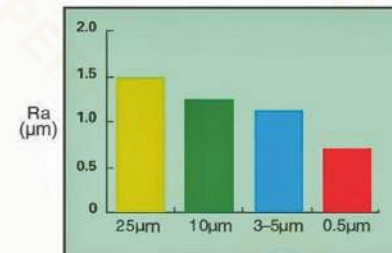
Microstructure of PCD materials



Differences in wear-resistance among various PCD materials



Influences of PCD grain size on work-piece finish



Grain size affects surface finish

Parameters recommended for cutting tool materials

Grade	Work piece material	Hardness	Cutting Speed (m/min)	Feed (mm/rev)	Cutting depth (mm)
PCBNZ	Gray cast iron	HB170-300	500-1500	0.1-0.4	0.1-1.5
	Nodular cast iron	HB240-300	200-400	0.1-0.4	0.1-0.5
	Alloyed cast iron	HB240-300	150-300	0.05-0.4	0.1-0.5
	Fe-based P/M	HRC45-50	50-150	0.05-0.4	0.05-0.5
PCBNC	Hardened steels	HRC55-65	80-200	0.05-0.2	0.05-0.2
	Heat-resistant alloys		50-200	0.05-0.2	0.05-0.2
PCD	Al and Al alloys		200-3000	0.05-0.5	0.05-1.0
	*Non-mentals Cemented		100-500	0.05-0.5	0.05-1.0
	Carbide		20-30	0.05-0.2	0.05-0.2

PCD MATERIAL

Polycrystalline Diamond Tool Material (PCD)

Polycrystalline diamond (PCD) is a synthetic superhard material, and it is diamond powder sintered by ultra-high temperature and high pressure. Its hardness and wear resistance is close to natural diamond; its microscope hardness can reach 10000HV, good impact resistance, and it is suitable for processing with impact load; it has a very low coefficient of thermal expansion, thermal expansion coefficient is several times lower than hard alloy, in the long processing process, the radius of the cutting tool can remain unchanged, its wear resistance is dozens of times higher than hard alloy. When cutting, it is not easy to produce nodules, which is very beneficial to improve the finish of machining parts. Cutting can be eliminated smoothly with a small friction coefficient and good adhesion resistance. Processing workpiece surfaces without burr, no scratch, no fog, and chatter marks can achieve the effect of the car instead of grinding, such as: turning CD pattern; Copper, aluminum products highlight; Electrical shell batch flower; Lens processing, and others.

For all kinds of non-ferrous metal and non-metallic high-finish diamond cutting tools, aluminum, manganese, gold, silver, magnesium, lead, titanium, and other non-ferrous metals have excellent cutting ability. We have widely used in circuit board V-CUT, automotive hubs, engine pistons, bearing bush, optical instruments, and electrical and electronic industries. PCD is also ideal for processing wear-resistant non-metallic materials like cardboard, glass, nylon, and others. PCD products can withstand impact load, low to oil wear, repeatable grinding, and repeated use.



Machinable Material	Application Area
Aluminum Aluminium alloy Cast aluminium alloy	Automobiles, automobile parts: engines, various casings, bearings, bicycle parts. Aircraft parts; All kinds of casings, fuselages, all kinds of compression parts. Precision machinery parts: hydraulic machinery, machinery parts, etc.
Copper Copper alloy Cast copper alloy	Automobile, all kinds of vehicles, Marine parts: all kinds of mandrel, gear, bearing parts. Motor mechanical parts: motor, commutator. General mechanical parts: all kinds of bearings, screws.
Super hard alloy	Semi-sintered tungsten carbide (die, etc.)
Non-metallic material	Solid wood and all kinds of artificial plywood, all kinds of organic materials, such as: acrylic, reinforced synthetic resin and stone, concrete, ceramics, etc.

PCBN MATERIALS

**Polycrystalline Cubic Boron Nitride Material (PCBN)**

Polycrystalline cubic boron nitride (PCBN) is a polycrystal sintered by cubic boron nitride (CBN) micro powder and binder under high temperature and pressure. The binder mainly includes the metal type (such as Co, Ni) and ceramic type (such as TiC, TiN, AlO). Cubic boron nitride (CBN) has a similar structure to diamond, similar chemical bonds, and similar lattice constants, so it has similar hardness and strength to diamond. The hardness of cubic boron nitride is second only to diamond; its micro hardness is 8000-9000HV, and polycrystalline cubic boron nitride PCBN hardness is generally 3000-5000HV. When cutting wear-resistant materials, its wear resistance is 50 times that of carbide cutting tools, 30 times that of coated carbide cutting tools, and 25 times that of ceramic cutting tools.

Because the PCBN tool has good chemical corrosion resistance and shows good thermal stability and red hardness at high temperatures, the relatively high temperature of the tool-tip will not have any adverse effect on it; on the contrary, it can also play a role in the cutting of hardened steel, hard alloy, and other materials to accelerate the cutting.

PCBN tool has higher impact strength and crushing resistance than a ceramic tool, which is usually used to process cast iron, hardened steel, and other black metal materials. In addition, some special PCBN tools can withstand the cutting load of high-power roughing, the impact of intermittent cutting, and the wear and cutting of the finishing heat.

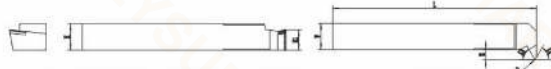
This year, with the rapid development of CNC (computer) processing technology and the widespread use of CNC machine tools, can achieve high efficiency, high stability, long life processing of the application of PCBN tools is increasingly popular, but also introduced many advanced machining concepts, such as high-speed cutting, complex machining, turning instead of grinding and dry cutting. PCBN tool material has become an indispensable tool material in modern cutting.



Machinable Material	Application Area
Tool steel Carbon tool steel Alloy tool steel High speed steel	All kinds of cutting tools, forging tools, all kinds of die rolling forming rollers
Heat resistant steel, super heat resistant alloy Super hot steel N1 base super heat resistant alloy Co base super-heat resistant alloy	Internal combustion engine parts, jet engine parts, steam pulley parts, furnace parts, HCL resistant nickel base alloy, nickel ferrous alloy, tungsten-cobalt alloy, powder metallurgy materials
Molten metal, cast iron Co - based surface hardening alloy Strong cast iron, special cast iron	Corrosion resistance, abrasion resistance parts, forming roller
Structural alloy steel (surface hardened) Chrome-molybdenum, nickel-molybdenum	Mechanical parts, others.

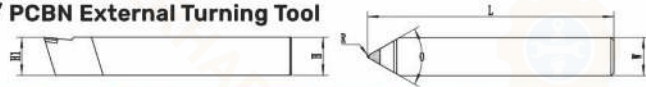
PCD / PCBN CUTTER

PCD / PCBN Internal Thread Cutter



Type	W	H	L	H1	H2	KR	R	E
19-1-1	13	13	100	10	0.7	60	0.05	5
20-1-1	13	13	100	10	0.7	60	0.05	5
19-2-1	16	16	130	13	0.7	60	0.05	5
20-2-1	16	16	130	13	0.7	60	0.05	5

PCD / PCBN External Turning Tool



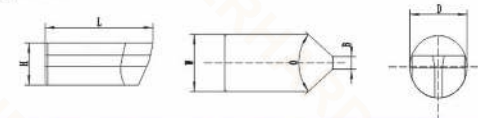
Type	W	H	L	H1	O	R		
ZYJ-1	12	12	50	12	90/60	0.2		
ZYJ-2	14	14	80	14	90/60	0.4		
ZYJ-3	16	16	100	16	90/60	0.4		
ZYJ-4	18	18	100	18	90/60	0.8		
ZYJ-5	20	20	110	20	90/60	0.8		

PCD / PCBN External Turning Tool



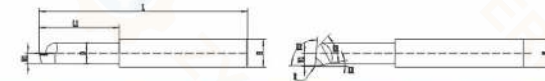
Type	W	H	L	W1	H1	KR	ER	R
ZYW-1	12	12	100	17	12	5	45	0.2
ZYW-2	16	16	110	21	16	5	45	0.4
ZYW-3	20	20	110	25	20	5	45	0.8

PCD Notching Tools



Type	D	B	H	L	O		
ZY-06	4.5	0.9	2.7	10.7	80		
ZY-05	4	0.8	2.4	9.55	80		
ZY-04	4	0.7	2.4	7.83	70/80		
ZY-04F	4	0.6	2.4	7.53	85		
ZY-03	3.2	0.6	1.92	6.42	70/80		
ZY-03LF	3.2	0.5	1.92	6.19	80		
ZY-02	2.5	0.5	1.5	5.12	70/80		
ZY-01	2	0.4	1.2	4.06	80		

PCD / PCBN Internal Turning Tool



Type	KR	W1	H1	H	W/D	L	D	L1	ER	R
ZYN-01	95	6	10	20	20	120	10	30	70	0.4
ZYN-02	95	6	12.5	25	25	120	10	30	80	0.4
ZYN-03	95	9.5	10	20	D20	120	16	30	70	0.4
ZYN-04	95	9.5	10	20	D20	120	16	30	90	0.4

PCD / PCBN / CBN CUTTER

PCD/PCBN Milling Cutter



Type	D1	L1	L2	D	L	Z		
ZYX-6	6	4	15	6	50	2		
ZYX-8	8	5	30	8	80	2		
ZYX-10	10	6	35	10	100	2		
ZYX-12	12	6	40	12	120	2		
ZYX-16	16	6	40	16	120	2		

PCD/PCBN Oblique Milling Cutter



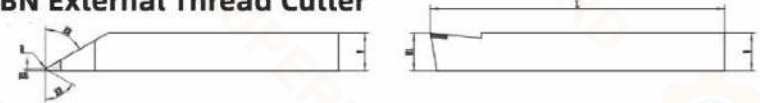
Type	D1	L1	L2	D	L	Z	O	
ZYZ-6	6	4	15	6	50	2	2	
ZYZ-8	8	5	30	8	80	2	2	
ZYZ-10	10	6	35	10	100	2	2	
ZYZ-12	12	6	40	12	120	2	2	
ZYZ-16	16	6	40	16	120	2	2	

PCD/PCBN Ball End Milling Cutter



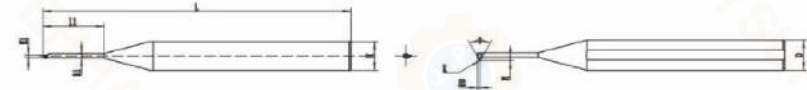
Type	D1	L1	L2	D	L	Z	R	
ZYW-6	6	4	15	6	50	2	3	
ZYW-8	8	5	30	8	80	2	4	
ZYW-10	10	6	35	10	100	2	5	
ZYW-12	12	6	40	12	120	2	6	
ZYW-16	16	6	40	16	120	2	8	

PCD/PCBN External Thread Cutter



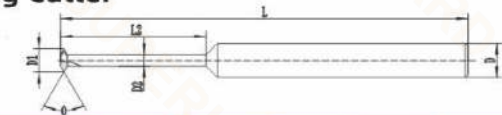
Type	W	H	L	H1	H2	KR	R	
21-0	10	10	100	10	0.7	60	0.05	
21-1	13	13	100	13	0.7	60	0.05	
21-2	16	16	130	16	0.7	60	0.05	

PCD/PCBN Internal Thread Cutter



Type	O	D1	H1	D	L	L1	E	
ZYM-3	60	1.5	0.75	6	70	20	1	
ZYM-4	60	2	1	6	70	20	1	
ZYM-6	60	4	2	6	70	20	1	

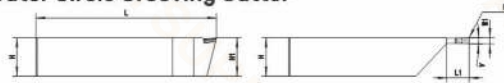
PCD/CBN Thread Milling Cutter



Type	O	D1	L2	D	L	D2	Z	
ZYM-4-2	60	4	20	6	70	2	2	
ZYM-6-2	60	6	30	6	70	4	2	

PCD / PCBN CUTTER

PCD / PCBN Outer Circle Grooving Cutter



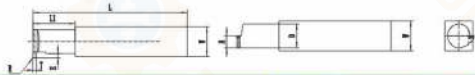
Type	W	H	L	H1	A	W1	L1	R
ZYC-1.8	10	10	120	10	2	1.8	10	0.1
ZYC-2.0	12	12	120	12	2	2	12	0.1
ZYC-3.0	14	14	120	14	2	3	15	0.1
ZYC-4.0	16	16	120	16	2	4	15	0.1

PCD / PCBN End Face Groove Cutting Tools



Type	W	H	L	T	L1	R		
ZYCD-3	20	20	120	3	15	0.1		
ZYCD-3.5	25	25	120	3.5	15	0.2		
ZYCD-4.0	25	25	120	4	15	0.2		

PCD / PCBN Inner Grooving Cutting Tools



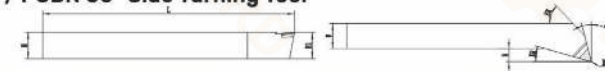
Type	W	D	L	L1	T	E	H	R
ZYKN-2.0	20	12	100	15	2	4	6	0.1
ZYKN-2.5	20	16	110	30	2.5	4	8	0.1
ZYKN-3.5	34	28	145	45	3.5	6	14	0.1

PCD / PCBN 40° Outer Side Turning Tool



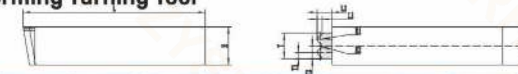
Type	W	H	L	H1	KR	ER	R	E
17-1-L	13	13	120	13	5	45	0.05	5
17-1-R	13	13	120	13	5	45	0.05	5
17-2-L	16	16	130	16	5	45	0.2	5
17-2-R	16	16	130	16	5	45	0.2	5

PCD / PCBN 60° Side Turning Tool



Type	W	H	L	H1	KR	ER	R	E
15-0-L	10	10	90	10	30	45	0.05	5
15-0-R	10	10	90	10	30	45	0.05	5
15-1-L	13	13	120	13	30	45	0.2	5
15-1-R	13	13	120	13	30	45	0.2	5
15-2-L	16	16	130	16	30	45	0.2	5
15-2-R	16	16	130	16	30	45	0.2	5

PCD / PCBN Forming Turning Tool



Type	W	H	L	L1	L2	T	T1	T2	R1	R2
75-150-1	22	22	110	3	9	15.32	3.83	7.66	1.65	2.07
75-150-4	22	22	110	3	9	14.88	3.175	7.43	1.77	1.77
78-130-1	22	22	110	4.07	10.07	19.56	4.89	9.78	2.12	2.36



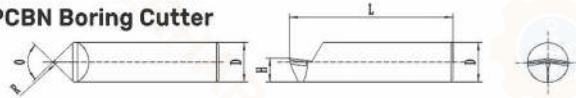
## PCD / PCBN CUTTER

### PCD / PCBN Double Bevel Grooving Cutter



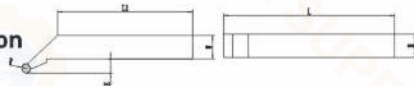
Type	W	T	L	H	R	KR		
ZYKV-1	3.2	1.8	66	20	0.1	7° 30'		
ZYKV-2	3.8	1.8	66	20	0.1	7° 30'		
ZYKV-3	4.2	1.8	66	20	0.1	7° 30'		
ZYKV-4	4.5	1.8	66	20	0.1	7° 30'		

### PCD / PCBN Boring Cutter



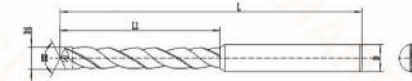
Type	D	L	H	O	R			
ZYKT-1	5	30	4	90	0.8			
ZYKT-2	8	30	5	90	0.8			
ZYKT-3	10	35	6	90	0.8			
ZYKT-4	12	35	7	90	0.8			

### PCD Turning Tool For Aluminum Alloy Piston



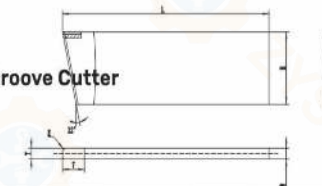
Type	R	L	L1	E	W	H		
ZYKR-2.5	2.5	150	120	12	20	20		
ZYKR-3	3	150	120	12	20	20		
ZYKR-4	4	150	120	12	20	20		
ZYKR-5	5	150	120	12	20	20		

### PCD / CBN Drill Bit



Type	D1	L1	D	L	ER			
ZYKZ-2.0	2.0	15	4	60	118			
ZYKZ-2.5	2.5	15	4	60	118			
ZYKZ-3.0	3	30	3	60	118			
ZYKZ-4.0	4	30	4	60	118			
ZYKZ-5.0	5	45	5	80	118			
ZYKZ-6.0	6	55	6	100	118			

### PCD / PCBN Straight Groove Cutter



Type	W	T	L	H	R			
ZYKH-1	1	1	66	20	0.1			
ZYKH-2	2.04	2.04	66	20	0.1			
ZYKH-3	3.05	3.05	66	20	0.1			
ZYKH-4	4.05	4.05	66	20	0.1			

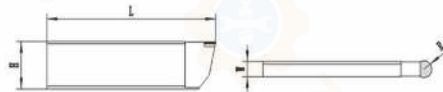
## PCD / PCBN CUTTER

### PCD Turning Tool For Aluminum Wheel Hub



Type	R	H	W	L				
ZYCL-2.0	2	25	25	150				
ZYCL-2.5	2.5	25	25	150				
ZYCL-3.0	3	25	25	170				
ZYCL-4.0	4	25	25	170				

### PCD Clamped Turning Tool For Wheel Hubs



Type	R	H	W	L				
ZYG-2.0	2	16	4	65				
ZYG-2.5	2.5	16	5	65				
ZYG-3.0	3	16	6	65				
ZYG-4.0	4	16	8	65				
ZYG-5.0	5	16	10	65				

## PCD / CBN Standard Blade

### 1 PCD Welding Blade



### 2 PCD / CBN Non-Welded Full Face Blade



### 3 CBN Through Welding Blade



### 4 Solid CBN



### 5 MCD / ND Welding Blade



### 6 Chip-breaking Welding Blade



## PCD / CBN Welding Non-standard Cutting Tool

### 1 Turning Boring Grooving Cutter



### 2 Step Drill Reamer / Milling Cutter



### 3 Twist Drill, Straight Groove Drill



### 4 PCD Saw Blade



### 5 Engraving Tools



### 6 PCD Woodworking Tool

