



**BETTER OIL TOOLS**

50 Raffles Place # 15-05  
Land Tower 048623  
Singapore  
[www.betteroiltools.com](http://www.betteroiltools.com)

## Contact Us

Better Oil Tools LTD.  
Mail : [sales@betteroiltools.com](mailto:sales@betteroiltools.com)  
[www.betteroiltools.com](http://www.betteroiltools.com)

# *HIGH QUALITY INTEGRITY INNOVATION AND REFINEMENT*



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## Grades, properties and applications of tungsten carbide rods

Grade	ISO code	Cobalt content (%)	Hardness (HRA)	Density (g/cm <sup>3</sup> )	T.R.S (ISO3327)	WC Grain size (um)	Application recommended
YU06	K05-K10	6%	94.0	14.75	3700	0.4-0.5	Suitable for machining aluminum-magnesium alloys, glass fiber, carbon fiber, wood, harden plastic, etc. It is recommended for making PB micro tools and other material drills
YG6X	K05-K10	6%	92.5	14.92	3000	0.7-0.9	Suitable for machining chilled alloy cast iron, heat-resistance alloy steel, non-ferrous metal, wood, paper, plastic and aluminum-magnesium, etc. It is recommended for making solid carbide drills, milling and reamers
YL10.2	K20-K30	10%	91.8	14.45	3800	0.7-0.9	Suitable for machining carbon steel, cast iron, stainless steel, heat-resistance steel nickel based alloy and titanium alloy. It is recommended for making different specification tools, such as drills, end mills, screw taps, rotating file A good material for general-purpose.
JT401	K30-K40	12%	92.0	14.15	4000	0.5-0.7	Suitable for machining nickel based alloy, titanium alloy, stainless steel, mould steel, chilled hardened steel and grey cast iron, etc. It is recommended for making milling tools and reamers, for high speed machining
YG15	K30-K40	15%	87.6	14.00	4000	1.2-1.4	Suitable for making solid mould dies and tools for punching operation.

## Sizes and photos of tungsten carbide rods

- T.R.S is the measured value of C sample according to the ISO3327 standard.

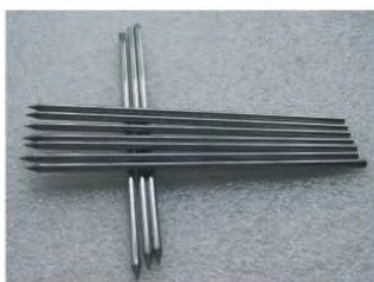
tungsten carbide rod	
D: 0.4~40mm	
L: 330mm, 320mm 310mm, 300mm	

tungsten carbide rod with one straight hole	
D: 4.0~24mm	
d: 0.8~2.5mm	
L: 330mm	

We can process carbide rods, such as grinding and polishing diameter, cutting short length, sharpening the end of rod.

**Advantages:** made from sub-micron and ultra-fine WC with homogeneous property, good wear resistance and high toughness.

**Applications:** widely used in endmills, drills, micro-drills, micro-mills etc.

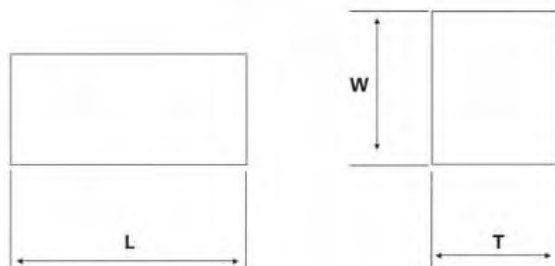


Other types can be supplied as customer's requirements

## Grades, properties and applications of tungsten carbide bars

Grade	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	Performance & application recommended	ISO
YG6	14.90	90.5	2400	Good wear resistance, suitable for machining hardwood, raw wood, aluminum section bar, brass rod and cast iron	K10
YG6A	14.85	92.5	2000	Wear resistance higher than YG6, suitable for machining hardwood, raw wood, aluminum section bar, brass rod and cast iron	K10
YG8	14.7	89.8	2800	High wear and impact resistance, suitable for machining dry wood, soft wood and non-ferrous metal section bar	K20
YS2T	14.25	92.0	2400	Fine grain alloy, with high wear resistance, bending strength, bonding resistance and thermal strength. It is suitable for machining refractory alloys, stainless steel, high manganese steel. Etc.	K30
YS25	13.0	91.0	2200	Wear resistance and strength comparatively higher, suitable for machining cast iron, non-ferrous metal and non-metallic materials.	
YL10.2	14.45	91.8	3000	Wear resistance and strength comparatively higher, suitable for machining cast iron, non-ferrous metal and non-metallic materials.	K30

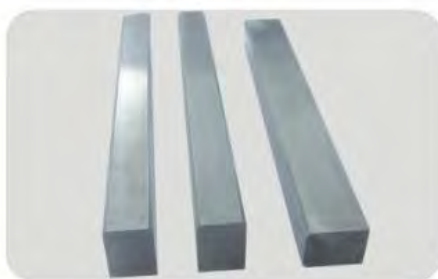
## Sizes and photos of tungsten carbide bars



W(mm)	T(mm)	L(mm)
3	1.2~10	10~330
4	1.2~10	10~330
5	1.2~10	10~330
6	1.2~10	10~330
7	1.2~10	10~330
8	1.2~10	10~330
9	1.2~10	10~330
10	1.2~10	10~330
11	1.2~10	10~330
12	1.2~10	10~330
13	1.2~10	10~330
14	1.2~10	10~330
15	1.2~10	10~330
16	1.2~10	10~330
17	1.2~10	10~330

W(mm)	T(mm)	L(mm)
18	1.2~10	10~330
20	1.2~10	10~330
22	1.2~10	10~330
25	1.2~10	10~330
28	1.2~10	10~330
30	1.2~10	10~330
32	1.2~10	10~330
35	1.2~10	10~330
38	1.2~10	10~330
40	1.2~10	10~330
50	1.2~10	10~330
70	1.2~10	10~330
100	1.2~10	10~330
80	1.2~10	10~330

- Remarks :** 1. we can supply bars' width 7, 8, 9, 10, 11, 12mm with single chamfer or double chamfers.  
 2. for some sizes, we can supply longer than 330mm length. Welcome to contact for more details.



Other types can be supplied as customer's requirements

## Grades, properties and applications of tungsten carbide plates

Grade	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	Performance & application recommended
YG6A	14.85	32.5	2000	Fine grain alloy, good wear resistance. It is suitable for manufacturing forming cutter, wear-resistant parts etc.
YG8	14.7	89.8	2800	High bending strength, wear resistance lower than YG6A, suitable for manufacturing forming cutter, wear-resistant parts etc.
YG11	14.4	88.5	2900	
YG15	14.0	87.0	3000	Suitable for manufacturing punching dies, wear-resistant parts etc.
YG20	13.5	85.5	2800	High bending strength, suitable for manufacturing progressive dies and other punching dies
YG13X	14.2	90.0	3200	
YS2T	14.25	92.0	2500	Fine grain alloy with high wear resistance, bending strength, bonding resistance and thermal strength. It is suitable for machining refractory alloys, stainless steel, high manganese steel etc.

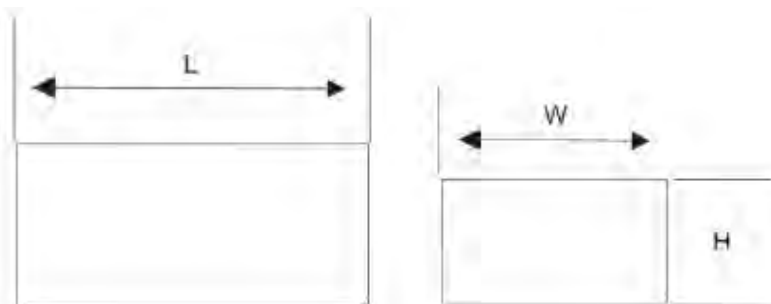
### CHARACTERISTICS OF CARBIDE PLATES:

Perfect microstructure, good wear resistance impact resistance, and high toughness

### APPLICATIONS:

Widely used in mould industry, such as tungsten carbide progressive dies, punch dies and powder metallurgy pressing dies etc...

## Sizes and photos of tungsten carbide plates

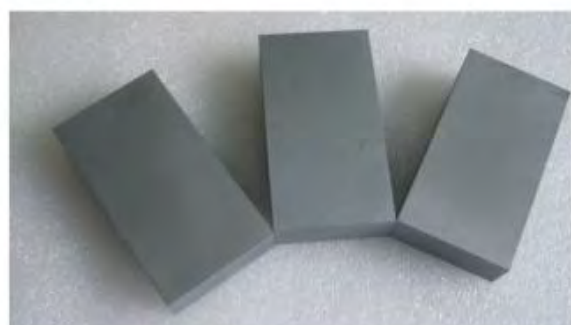
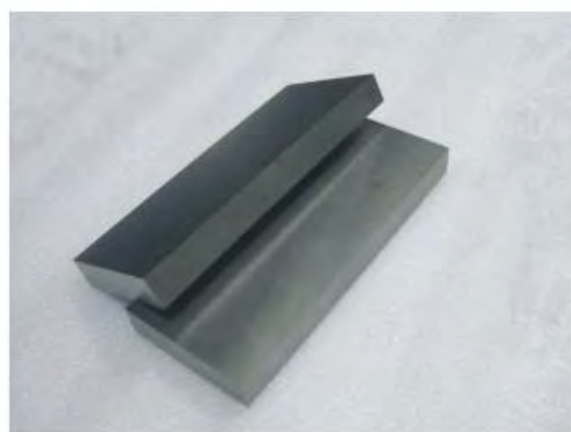
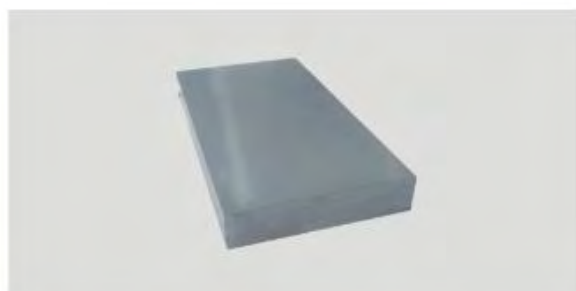


1. Advising HIP sintered for the plate which the thickness more than 10mm.

2. Before delivery to you, all plates were detected by no damage ultrasonic, keeping the plates all are no blister, no pore, high density & strength, impact resistance and long working life.

3. We can supply rough grinding or grinding the board surfaces.

L(mm)	W(mm)	H(mm)
300	200	10~45
200	200	10~45
200	20	10~45
150	150	10~45
150	130	10~45
150	100	10~45
150	80	10~45
120	120	10~45
105	105	10~45
100	100	10~45
100	50	10~45
100	45	10~45
80	55	10~45
80	40	10~45
70	35	10~45
45	25	10~45
35	19	10~45
20	20	10~45
18	12	10~45
...	...	...













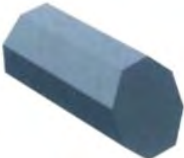






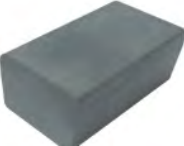
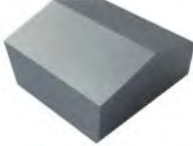

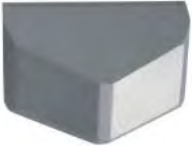

Other types can be supplied as customer's requirements



## Grades, properties and applications of tungsten carbide mining tips

Grade	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	Performance & application recommended	ISO
YG4C	15.1	90.0	1800	Mainly used as small buttons for percussion bits to cut soft and medium hard formations.	K01~K05
YK05	14.9	90.5	2600	For coring crowns, electric coal drill bits, coal cutting picks, oil cone bits and scraping knife bits, used in geological prospecting, coal mining and oil well boring	K10
YG8	14.7	89.8	2800	Suitable for coring crowns, electric coal drill bits, coal cutting picks, cone drill bits and scraping knife bits, used in geological prospecting, coal mining and oil well boring	K20
YG8C	14.7	89.0	2700	Mostly used as the buttons of small and medium sized percussion bits and as the inserts of rotary prospecting bits to cut soft and medium hard formations	K20
YK15 YG9C	14.6	88.0	2750	Suitable to strips, conical buttons for rotary percussion-resistant, geological prospecting buttons, cut soft and medium hard formations.	K20~K30
YK20 YG10C	14.5	87.5	2800	Primarily for the buttons and inserts of rotary percussion bits to cut medium-hard and hard formations	K30
YG11C	14.4	87.0	2850	Largely for the inserts and buttons of percussion bits and tricone bits to cut medium-hard, hard, and very hard formations.	K20~K30
YK40 YG13C	14.2	86.0	2900	Predominantly for the buttons of tricone bits and inserts of rotary percussion bits to cut hard and very hard formations	K40
YG15C	14.0	85.0	3000	For oil cone drill bits, for medium soft and medium-hard rocks.	K40
YG15	14.0	87.0	3000	Good strength and less wear resistance, for bits of rotary hammer rock drills and heavy rock drills, for hard and very hard rocks	K40

## Tungsten carbide mining tips series

				
K0, K10	K1, K20	K2	K3	K31
				
K21	K22	M21	M23	M24
				
T30	T40	Spherical buttons SQ	Conical buttons SZ	Spoon buttons
				
Parabolic buttons	Buttons for drilling road			
				
Shield machine inserts				

Other types can be supplied as customer's requirements

## Grades, properties and applications of tungsten carbide cylindrical dies

Grade	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	Performance & application recommended
YG11	14.4	88.5	2420	Forming or stamping dies for metal posers and nonmetal powders
YG15	14.0	87.0	3000	It is suitable for drawing steel tubes and rods under high compression ratio, manufacturing upsetting, punching and stamping tools under large stress.
YG20	13.5	85.5	2800	It is suitable for manufacturing punching dies for watch parts, leaf spring of musical instruments, battery jars, small sized steel balls, screws, screw caps, etc.
YG16C	13.9	85.0	2750	It is suitable for impact-resistant forging dies
YG18C	13.7	84.0	2800	It is suitable for impact-resistant forging dies, hot-forging dies and finishing rollers.
YG20C	13.5	83.0	2850	It is suitable for wear resistant or impact resistant dies.
YG22C	13.3	82.0	2900	It is suitable for nut forming dies and high impact-resistant dies.
YG25C	13.1	81.5	2950	It is suitable for stainless screw dies and semi finishing roller

## Tungsten carbide cylindrical dies

**Size:** outer diameter:  $\Phi 2 - \Phi 380\text{mm}$

bore:  $\Phi 1 - \Phi 360\text{mm}$

length/height: 1-200mm (Modification & HIP Process)

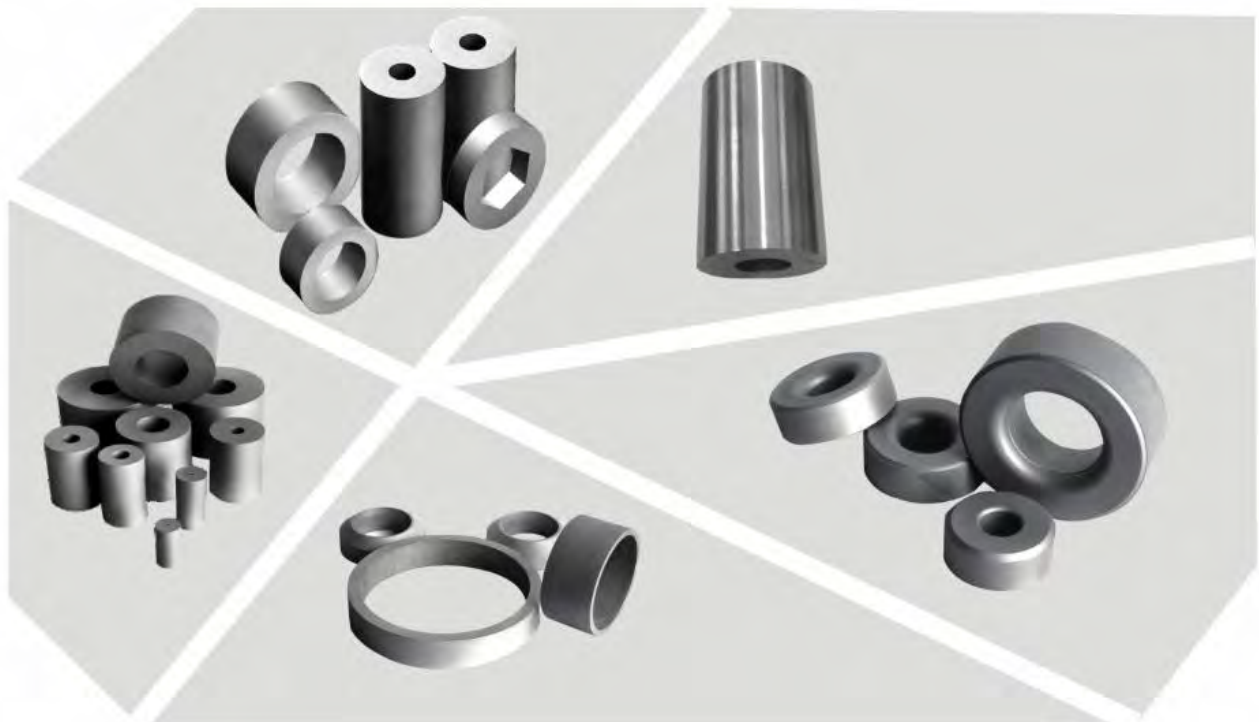
bolts & Nibs : Nut forming Dies: Non- standard Dies

### CHARACTERISTICS:

Homogeneous property, good wear resistance, high impact resistance

### APPLICATIONS:

Mould and die industry, such as cold heading dies, powder metallurgy dies and all kinds of hardware forging dies etc.



Other types can be supplied as customer's requirements

## Grades, properties and applications of tungsten carbide balls

Grade	CO percent (%)	Other percent (%)	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	specifications
YG6	6	94% WC	14.9	90.5	2400	With high hardness, wear resistance, corrosion resistance, anti-bending, tungsten carbide ball is used to replace steel ball,, Especially YN6, containing Ni2%, corrosion resistance is more excellent
YG8	8	92% WC	14.8	89.5	2800	
YG6X	6	94% WC	14.5	92.0	2300	
YN6	6	92% WC +2% Ni	14	90.0	1400	

**Usages:** The unground ball is suitable for milling all kinds materials; the grinding balls is suitable for precision punching member stretched, precision bearings, instruments, meters, Pen, spraying machines, pumps, machinery parts, valve seals, brake pump, squeeze-hole punch, oil, hydrochloric acid laboratory, hardness measuring instrument, fishing gear, with heavy, ornamented, fished, the high-end industry!

### (mm) Common diameters for grinding and polishing carbide balls

0.4	0.5	0.8	1	1.2	1.5	1.588	1.6
1.98	1.9844	2	2.38125	2.5	2.7781	3	3.175
3.5	3.969	4	4.5	4.7625	5	5.5526	5.963
6	6.35	6.5	6.747	7	7.144	7.5	7.938
8	8.5	9	9.5	9.525	10	10.319	10.5
11	11.1125	12	12.303	12.7	13	13.494	14
14.2875	15	15.081	15.875	16	17.4625	18	19
19.05	19.844	20	22.225	25	25.4	30	30.163
34.925	31.75	38	38.1	40	42.8625	45	50
50.8	53.963	60					

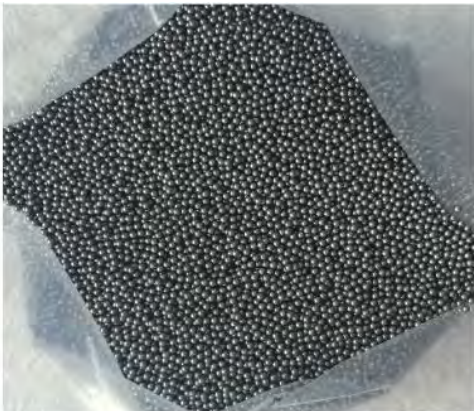
### Grinding grades

G3	G5	G10	G15	G16	G24	G25	G48
G50	G100	G200	G300	G500	G1000	G2000	G3000

## Unground ball with belt



## Ground and polished ball



Other types can be supplied as customer's requirements

## Grades, properties and applications of tungsten carbide inserts

Grade	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	Performance & application recommended	ISO
YG3A	15.1	94.0	1700	Suitable for finishing of cast iron and nonferrous metal.	K01~K05
YG3X	15.2	92.0	1800		
YG6A	14.85	92.5	2200	Suitable for the semi-finishing cast iron and nonferrous metals and also for the machining of manganese steel and hardened steel	K10
YG6X	14.9	91.5	2300		
YG6	14.95	90.5	2400	Suitable for the roughing of cast iron and light alloys and also for the milling of cast iron and low-alloy steel.	K15
YG8	14.7	89.8	2800		K20
YW1	13.1	91.6	1600	Suitable for finishing and semi-finishing of stainless steel and conventional alloy steel	M10
YW2	13.0	90.6	1800	The grade can be used for the semi-finishing of stainless steel and low-alloy steel and it is mainly used for the machining of railway wheel hubs.	M20
YT15	11.4	91.5	1600	Suitable for the finishing and semi-finishing for steel and cast steel with a moderate feed rate and rather high cutting speed.	P10
YT14	11.6	90.8	1700	Suitable for the finishing and semi-finishing of steel and cast steel.	P20
YT5	12.9	90.5	2200	Suitable for the heavy cutting of steel and cast steel with a big feed rate at a medium and low speed under unfavorable working condition	P30

## Photos of tungsten carbide inserts

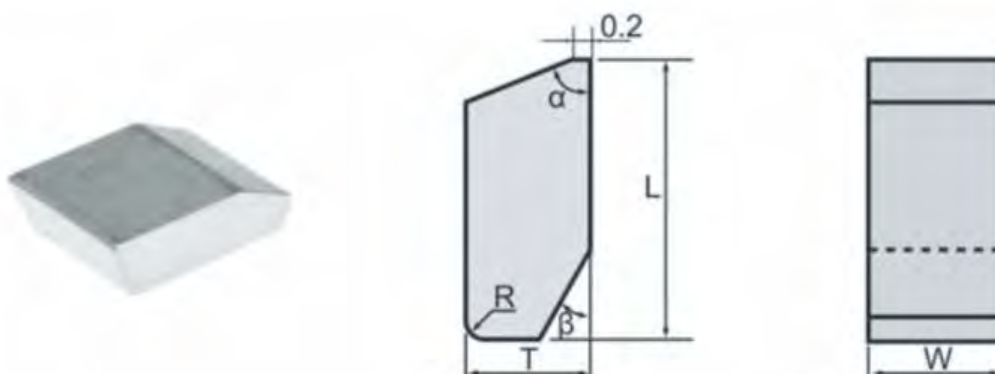




## Grades, properties and applications of tungsten carbide saw tips

Grade	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	ISO Code	Application recommended	Proposal for welding
YG6	14.6~15.0	≥90.0	≥1800	K20	Applying to the cutting of ordinary wood	For resistance welding, and the temperature should not be too high
YG8	14.6~14.9	≥89.5	≥1900	K30	For the cutting of ordinary wood & aluminum material	For resistance welding, and the temperature should not be too high
JX5	14.6~15.0	≥90.5	≥1900	K10	Applies to the cutting of hard wood, recycling wood and aluminum alloy material	For resistance welding, and the temperature should not be too high
JX9	14.5~14.9	≥90.5	≥2000	K10	Applying to the cutting of aluminum copper and lead, non-ferrous alloy material	Recommend the high-frequency welding
YG6X	14.7~15.0	≥91.5	≥1800	K10	Applying to the cutting of the timber	Recommend the high-frequency welding
JX10	14.8~15.1	≥93.3	≥2500	K05	Applying to the cutting of hard wood, also soft metal.	Recommend the high-frequency welding
JX15	14.6~15.0	≥92.5	≥2400	K05	Applying to the cutting of hardwood and aluminum alloy	Recommend the high-frequency welding
JX35	14.9~15.2	≥93.5	≥2000	K10	Applying to the cutting of plywood, mdf board and sandwich board	Recommend the high-frequency welding
JX40	12.8~13.2	≥90.5	≥2000	P40	Applying to the cutting of steel	Recommend the high-frequency welding

## The types and sizes of tungsten carbide saw tips



TYPE	Dimension (mm)					
	L	T	W	$\alpha^\circ$	$\beta^\circ$	R
JX4125	4.2	1.5	2.7	30	20	0.5
JX4514	4.5	1.4	3.0	28	15	0.6
JX4515	4.5	1.5	3.5	30	27	0.5
JX4615	4.6	1.5	3.6	30	26.6	0.5
JX4713	4.7	1.3	3.4	33	-	0.5
JX4715	4.7	1.5	3.7	30	30	0.5
JX4816	4.8	1.6	3.5	30	14	0.5
JX5014	5.0	1.4	3.5	30	15	0.5
KX5014A	5.0	1.4	3.5	20	25	0.5
JX5015	5.0	1.5	3.5	20	20	0.5
JX5015A	5.0	1.5	4.0	30	26.5	0.5
JX5015B	5.0	1.5	4.5	20	45.	0.5
JX5015C	5.0	1.5	3.6	30	0.5x45°	-
JX5016	5.0	1.6	4.0	30	22	0.5x45°

TYPE	Dimension (mm)					
	L	T	W	$\alpha^\circ$	$\beta^\circ$	R
JX5016A	5.03	1.63	4.5	25	0.7x45°	0.5
JX5016B	5.0	1.6	3.6	20	20	0.6
JX5017	5.0	1.7	4.0	20	17.1	0.5
JX5022	5.0	2.2	4.3	30	15	0.5
JX5025	5.0	2.5	3.4	25	45	0.5
JX5115	5.1	1.5	3.7	28	0.5x45°	0.2
JX5116	5.1	1.6	2.5	30	22	0.2
JX5216	5.2	1.6	3.8	25	20	0.5
JX5218	5.2	1.8	4.0	18	40	0.5
JX5220	5.2	2.0	3.5	30	15	0.5
JX5315	5.3	1.5	3.8	20	20	0.5
JX53155	5.3	1.55	4.3	28	15	0.5
JX5315A	5.3	1.5	4.0	30	20	0.5
...	...	...	...	...	...	...

We can produce mould according to your drawings and samples for different shapes and sizes.  
Offer saw tips of European style, US & Canadian style, metal cutting series.

Other types can be supplied as customer's requirements

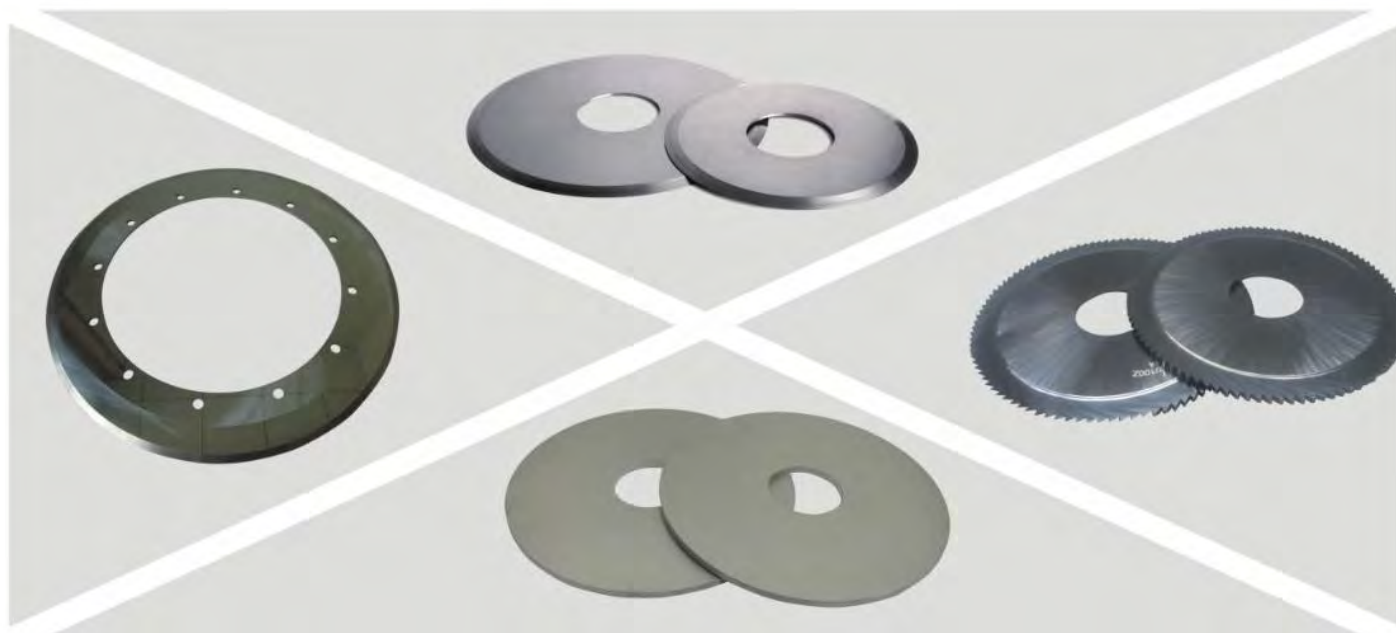
## Grades, properties and applications of tungsten carbide disc cutters

Grade	Density (g/cm <sup>3</sup> )	Hardness (HRA)	T.R.S (MPa)	Performance & application recommended	ISO
YG6X	14.90	92.5	2400	Fine grain alloy, with good wear resistance. It is suitable for semi finishing the chilled cast iron, nonferrous metal and its alloy. It is also suitable for semi finishing and finishing the hardened steel and alloy steel.	K10
YG6	14.70	90.0	2400	Higher strength, impact and shock resistance than YG6X, but lower in wear resistance and cutting speed. It is suitable for rough machining cast iron, nonferrous metal and its alloy as well as non metallic materials at low cutting speed.	K20
YG8	14.70	89.5	2300	Higher strength, impact and shock resistance than YG6, but lower in wear resistance and cutting speed. It is suitable for rough machining cast iron, nonferrous metal and its alloy as well as non metallic materials at low cutting speed.	K20
YG10X YL10.2	14.40	91.8	3400	Fine grain alloy, with good wear resistance. It is suitable for machining hardwood, plywood, PCB, PVC and metals	K10 – K20
YS2T	14.30	92.0	2500	Fine grade alloy, with high wear resistance, bending strength, bonding resistance and thermal strength. It is suitable for machining plywood, PCB, PVC, refractory alloys, stainless steel and high manganese steel, etc.	K10 – K20
YG13X	14.20	90.0	3200	Moderate wear resistance and bending strength, suitable for machining steel alloy etc.	K20 – K30

## Types of tungsten carbide disc cutters

TYPE	OD (mm)	ID(mm)	Thickness (mm)
Φ12x Φ6xs	12	6	0.6-4.5
Φ13x Φ6xs	13	6	0.6-4.5
Φ16x Φ6xs	16	6	0.6-4.5
Φ22x Φ10xs	22	10	0.6-4.5
Φ25x Φ12xs	25	12	0.6-4.5
Φ32x Φ10xs	62	10	0.8-5.5
Φ40x Φ10xs	40	10	0.8-6.0
Φ45x Φ13xs	45	13	0.8-6.0
Φ52x Φ24.5xs	52	24.5	0.8-6.0
Φ53x Φ12xs	53	12	0.8-6.0
Φ53x Φ24.5xs	53	24.5	0.8-6.0
Φ55x Φ16xs	55	16	0.8-6.0
Φ52x Φ22xs	58	22	0.8-6.0
Φ60x Φ19xs	60	19	0.8-7.0
Φ63x Φ17xs	63	17	0.8-7.0

TYPE	OD(mm)	ID(mm)	Thickness (mm)
Φ70x Φ22xs	70	22	0.8-7.0
Φ75x Φ22xs	75	22	0.8-7.0
Φ80x Φ22xs	80	22	0.8-7.0
Φ83x Φ21xs	83	21	0.8-7.0
Φ86.5x21.5xs	86.5	21.5	1.0-7.0
Φ90x Φ22xs	90	22	1.0-7.0
Φ100x Φ22xs	100	22	1.0-7.0
Φ125x Φ22xs	125	22	1.0-7.0
Φ200x Φ70xs	200	70	3.0-4.5
Φ250x Φ70xs	250	70	3.0-4.5
Φ250x Φ160xs	250	160	3.0-4.5
Φ250x Φ92xs	250	95	3.0-4.5
Φ310x Φ 193xs	310	193	3.0-4.5
Φ310x Φ198xs	310	198	3.0-4.5
...	...	...	...



Other types can be supplied as customer's requirements

## Tungsten carbide composite rods /YD welding rods

1. **Usage:** It is mainly used to overlay the worn-out and cutting usage workpieces in oil, mining, coal mining, geology, construction and other industries. Such as milling shoes, wear shoes, centralizers, reamer, drill pipe joints, hydraulic cutter, scraper blade plow planer, drill core, piling drill, auger, etc.
2. **Compositions:** WC, CO, CU, Zn, Ni, etc
3. **Sizes of tungsten carbide scraps:** 3.2-4.8mm, 4.8-6.4mm, 6.4-8.0mm
4. **Sizes:** 8\*10mm\*280mm, 10\*20mm\*430mm

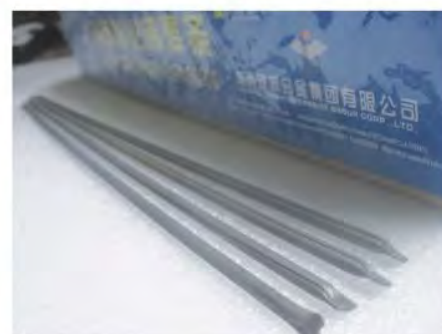


Other types can be supplied as customers' requirements.

## Cast tungsten carbide and Cast tungsten carbide welding rods

Grade	(% ) Chemical Compositions									Recommended application
	W	T.C	F.C	Ti	Ni	Co	Cr	V	Fe	
Up-101	95-96	3.8-4.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	≤0.3	It is widely used in mining, petroleum, metallurgical industry, building and iron-steel. As PCD drill bits, drill pipe, can also be used for surface reinforcement tools
Up-101-H	95-96	3.8-4.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	≤0.5	
Up-102		3.8-4.1	<0.05	<0.1	3-6	<0.1	<0.1	<0.1	≤0.3	
Up-102-H		3.8-4.1	<0.05	<0.1	3-6	<0.1	<0.1	<0.1	≤0.5	

Hardness (HRA)	Microhardness (kg/mm <sup>2</sup> )	Density (g/cm <sup>3</sup> )	Melting Point (°C)
93.0~93.7	2500~3000	16.5	2525



Other types can be supplied as customer's requirements

## Pure tungsten material

Tungsten material's advantages are high melting point, corrosion-resistant, high density, good thermal and electrical conductivity, the common products are tungsten pole/needle, tungsten electrode, tungsten plate, tungsten rod/bar etc. The common tungsten percent is 99.95%, also can up to 99.98%. We can supply all kinds of sizes according your request.

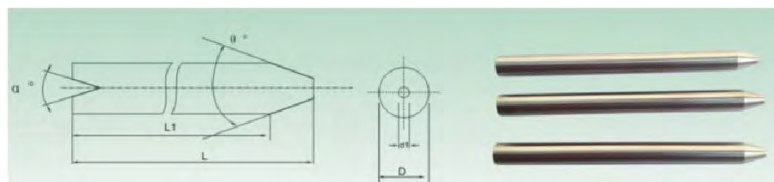


Other types can be supplied as customer's requirements

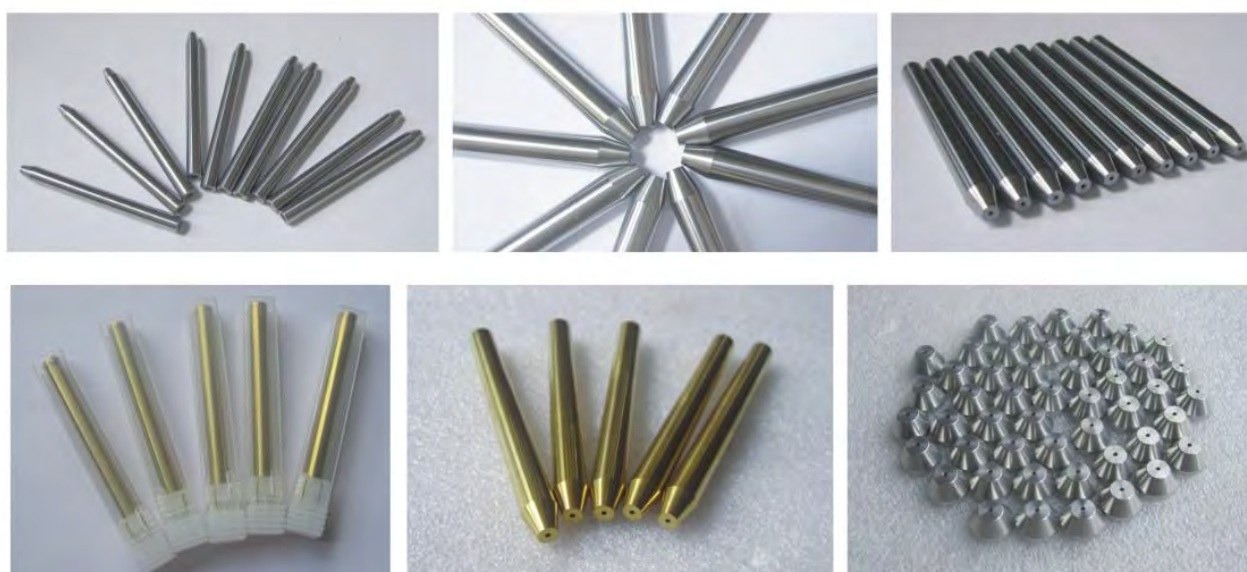
## Abrasive waterjet nozzles

### Advantages:

1. The abrasive waterjet nozzle is made of ultrafine nano-wc particles with a higher level of wear resistance, excellent abrasion resistance, the working life is far beyond tungsten carbide nozzles
2. The cobalt content is less than 0.6%, density 15.45-15.60g / cm<sup>3</sup>, T.R.S 2000-2400 Mpa. The abrasive waterjet nozzles have more stronger wear resistance for superior resistance to oxygen, thermal expansion coefficient, high hardness and absolute density far more than other similar products.



ΦD (mm)	Φd (mm)	L (mm)	Θ	a
6	0.76	76.2	40	28
6	1.02	76.2	40	28
6.35	0.5	76.2	40	28
6.35	0.76	76.2	40	28
6.35	1.02	76.2	40	28
7.14	0.76	76.2	40	28
7.14	1.02	76.2	40	28
7.6	0.76	76.2	40	28
7.6	1.02	76.2	40	28
9.45	0.76	76.2	40	28
9.45	1.02	76.2	40	28



Other types can be supplied as customer's requirements



**BETTER TOOLS BETTER PERFORMANCE**



**BETTER OIL TOOLS Ltd.**

50 Raffles Place #15-05  
Singapore Land Tower  
Singapore 048623

[www.betteroiltools.com](http://www.betteroiltools.com)



**CONTACT US**

**Mobile** +66 87067 7227

**Email** [sales@betteroiltools.com](mailto:sales@betteroiltools.com)