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ZHUZHOU GOODE INDUSTRY CO., LTD



**TUNGSTEN CARBIDE
TUNGSTEN HEAVY ALLOY**

COMPANY OVERVIEW

GOODE CARBIDE has been the China leader on the market for tungsten carbide parts for various industry. We supply in the design and manufacture of agricultural parts reinforced with tungsten tiles, metal cutting tools, carbide rods (rough blanks or polished) and EDM blocks, cold heading dies, tobacco carbide slitter, tungsten heavy alloy in weight balance and counterweights to thousands of customers, earning a reputation for comprehensive service, speedy delivery, exceptional quality and reliability.

With over 30 years industry experience, we are committed to product innovation and development and our dedicated team of expert sales, product specialists, developers and technical engineers are on hand to offer advice and expertise to help you find the supplies you are looking for. We pride ourselves on working closely with our customers to offer and develop the latest parts and products needed to maximise the efficiency of their businesses.

Our Advantages

- (1) Inventor of tungsten carbide parts and cutting tools and tungsten heavy alloy
- (2) Chinese manufacture leader for 30 years
- (3) The only manufacturer to master the production of its carbide tips (over 500 made-to-measure models).
- (4) A market-oriented Research and Development department proposing ever more efficient and innovative products
- (5) A wide range of over 1,200 part references, covering every kind of industry operation.
- (6) High-quality products, guaranteed by AC marking.
- (7) More than 20 technical sales representatives at your service
- (8) R&D department designs unique products that are specially developed to fit each usage, each machine and each type of wear or cutting

OUR FACTORY



OUR FACTORY



OUR FACTORY



TUNGSTEN CARBIDE RODS

WHAT ARE TUNGSTEN CARBIDE RODS?



*Solid tungsten carbide rods are widely used for high-quality solid carbide tools such as milling cutters, end-mills, drills or reamers.

*Specialized in tungsten carbide round bars, with an outstanding product line of solid carbide rod, we manufacture and stock unground and ground carbide rods for you.

*h6 polished chamfered carbide rods are most popular.

*Our grade ISO K05 to K40, from machining aluminium, steel, non-ferrous metals, to titanium or we develop grade for your applications.

*Our 10% cobalt grade GD12 is widely used for machining aluminium and steel or general application. Our 12% cobalt grade GD14 is especially suitable for machining hard material like stainless steel and composite material. All these grades are made from Ultra-fine grain tungsten carbide.

MATERIAL GRADE:

GRADE		GD12	GD14	GD12
ISO		K20-K30	K40-K50	K05
Cobalt	%	10	12	6
WC	%	90	88	94
Grain Size	um	0.6	0.5	0.8
Density	g/cm3	14.5	14.1	14.9
Vicker	Kg/mm2	1600	1680	1510
Rockwell	ISO3738	91.8	92.5	91.5
T.R.S	N/mm2	4000	4000	3400

BELOW IS ROUGH BLANK SOLID CARBIDE RODS SPECIFICATION:

Type (Dia. x Length)	Tol. Of Diameter	Tol. Of Length
Dia.0.50~12 x 330	+0.20~+0.45	0~+5.0
Dia.12.5~20 x 330	+0.30~+0.60	0~+5.0
Dia.21.0~42 x 330	+0.50~+0.80	0~+5.0

LENGTH TO BE CHOSEN:

300mm or 310mm or 330mm or Cut to the length as requested

Solid Carbide Rods in Unground

Solid Carbide Rods in Polished h6 or other requested

Sintering HIP.

The advanced computer-controlled HIP furnaces are applied to provide more pressure during the sintering process in order to get denser structure.

Powder Excellent.

Thanks to our deep cooperation with Germany H.C.Starck, we use the best powder for carbide rod in the world for all our standard grades for carbide rod manufacturing.

Production Fast.

Three different compaction methods, including extrusion, automatic press, and cold isostatic press are used for the maximum efficiency of carbide rod manufacturing.

SPECIAL METHODS

Extrusion

Extrusion is the most popular method of producing carbide rods. It is a very practical way to manufacture long carbide rods like 330mm.310mm and 500mm, etc. However, its time-consuming drying process is the weakness that we have to pay attention to.





Automatic Press

Automatic pressing is the most effective ways to press short sizes like 6*50,10*75,16*100, etc. It can save cost from cutting carbide rods and it doesn't need time to dry. So the lead time is faster than extrusion. On the other hand, long rods cannot be manufactured by this method.

Cold Isostatic Press

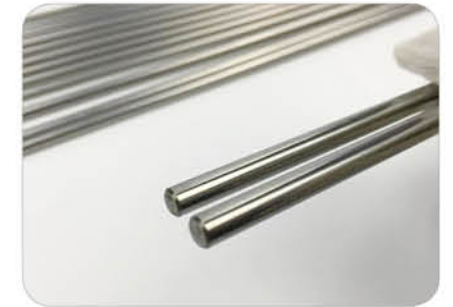
Cold isostatic press(CIP) is the latest technology of making carbide rods. Because it can make long bars like 400mm but it doesn't require wax like extrusion, so it doesn't need time to dry, either. This is the best option when making big diameters like 30mm and 40mm.



Unground Rod



Polished Rods



Polished Chamfered Rods

OUR RODS ARE WIDELY USED FOR BELOW APPLICATIONS:



Drill bits



End Mill



Milling Cutter



Reamers

COLD HEADING DIES



WHAT IS COLD HEADING

Cold heading manufacturing is a multi-step process used to form metal parts at room temperature. Unlike other metal fabrication processes, hammers and dies are used at a high speed to form the metal without heating the material.

A large coil of wire is fed into a blank and pulled through a drawing machine. The drawing machine compresses the material to the desired diameter. It then passes into the cold heading machine.

Inside the cold heading machine, the blank is hit between a die and a punch block, pushing the material into the die to create the desired shape.

We use two separate techniques for forcing the material into the die. With the upset method, the punch block forces the metal out of the die to produce a head larger than the initial blank.

The extrusion technique includes two methods, forward and backward extrusion. With forward extrusion, the cavity of the two dies is smaller compared to the diameter of the wire, which creates compression. With backward extrusion, the metal is forced backward through a punch to create a hole or cavity.

Cold heading is commonly used for creating custom screws, bolts, and other custom fasteners out of round metal stock.

WHEN SHOULD YOU CHOOSE COLD HEADING FOR YOUR PARTS?

Cold forming comes with advantages and disadvantages compared to other machining processes, such as screw machining.

While using a screw machine may eliminate the need for dies, cold forming requires dies to set the head shapes, which increases the lead time and initial cost. However, cold heading includes many benefits:

- Less waste
- Faster production
- Stronger parts
- Reduced costs

Using cold heading for your parts reduces material waste. More of the material is utilized during the cold forming process. This limits scrap and overall costs.

Goode Carbide produce as-sintered tungsten carbide die inserts and blanks for use in hot and cold heading die tooling and forming tool applications. Inserts are made to order and can be supplied in different tungsten carbide material grades with up to a 25% Cobalt binder to meet our customers' specific requirements to produce numerous bolts, screws and special fixings, in a variety of materials. We produce the die inserts and blanks in the as-sintered condition with the specific overall dimensions and special features our customers request ready for them to produce finished ground tooling.

Hot and Cold Heading Die Inserts

Cut-off Die Inserts

Forging Dies

Ejector Pins

Punches

Our factory is equipped to make tungsten carbide heading die inserts and forging dies blanks in all sizes up to a maximum outside diameter of 250mm. We maintain good supplies of our tungsten carbide raw material in stock and aim to supply the as-sintered die inserts and blanks on a short delivery lead time as required.

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APPLICATIONS:

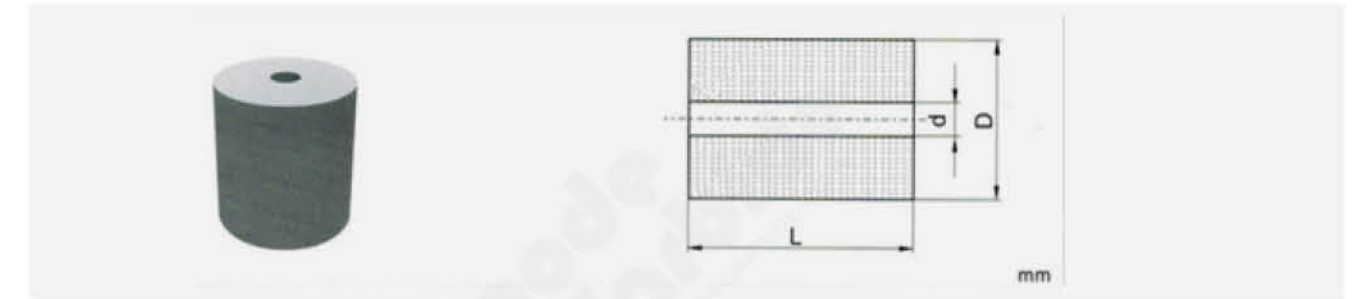
Tungsten carbide pellets are widely used in cold heading dies and punching dies for manufacturing nuts, screw caps, bolts, cans and many other products.

MATERIAL GRADE:

Grade	Density g/cm ³	T.R.S Mpa	Hardness HRA	Properties & Applications
GD10	13.5	3000	83.50	Good wear resistance and bending strength. It is often preferred by nut forming dies and high impact-resistant dies.
GD11	14.4	2420	88.50	Forming or stamping dies for metal powders and nonmetal powders.
GD15	14.0	2500	87.50	It is suitable for drawing steel tubes and rods under high compression ratio, manufacturing upsetting, punching and forging tools under large stress.
GD20	13.50	2800	85.50	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.
GD32	13.90	2750	85.50	It is suitable for impact-resistant forging dies.
GD36	13.70	2800	84.50	It is suitable for impact-resistant forging dies, hot-forging dies and finishing rollers.
GD40	13.50	2850	83.50	It is suitable for wear resistant or impact resistant dies.
GD50	13.30	2900	83.0	It is suitable for nut forming dies and high impact-resistant dies.
GD60	13.10	2950	82.50	It is suitable for stainless screw dies and semifinishing rollers.
GD80	13.10	3050	83.40	It is suitable for screw cap forming dies with high strength (highest impact-resistant forging dies).

SPECIFICATIONS:

Including but not limited to the following types.



Type	Dimension			Application
	d	D	L	
BDP00710-	0.7	10	12.0-20.0	M1
BDP01010-	1.0	10	12.0-20.0	M1.5-M2
BDP01013-	1.0	13	15.0-40.0	M1.5-M2
BDP01213-	1.2	13	15.0-40.0	M1.5-M2
BDP01510-	1.5	10	12.0-25.0	M2
BDP01516-	1.5	16	15.0-45.0	M2
BDP01813-	1.8	13	12.0-45.0	M2.5
BDP01816-	1.8	16	20.0-45.0	M2.5
BDP02113-	2.1	13	15.0-30.0	M3
BDP02116-	2.1	16	25.0-45.0	M3
BDP02316-	2.3	16	15.0-45.0	M3
BDP02522-	2.5	22	20.0-60.0	M3
BDP02813-	2.8	13	15.0-30.0	M4
BDP02816-	2.8	16	25.0-40.0	M4
BDP02818-	2.8	18	20.0-50.0	M4
BDP02820-	2.8	20	20.0-50.0	M4
BDP02822-	2.8	22	20.0-60.0	M4
BDP02825-	2.8	25	20.0-60.0	M4
BDP03216-	3.2	16	15.0-45.0	M4
BDP03218-	3.2	18	15.0-50.0	M4
BDP03616-	3.6	16	20.0-50.0	M5
BDP03618-	3.6	18	20.0-60.0	M5
BDP03822-	3.8	22	20.0-40.0	M5
BDP03830-	3.8	30	50.0-60.0	M5

PRODUCT PICTURES



TUNGSTEN CARBIDE EDM BLOCKS



TUNGSTEN CARBIDE EDM BLOCKS

Why Us?

- All grades are proven in their application.
- Products stocked globally for quick delivery.
- Standard and corrosion-resistant grades.
- 200 standard sizes with custom sizes available upon request.
- Application, Metallurgical, and Process

OPTIMIZATION SERVICES.

Expertise in Cemented Tungsten Carbide Metallurgy

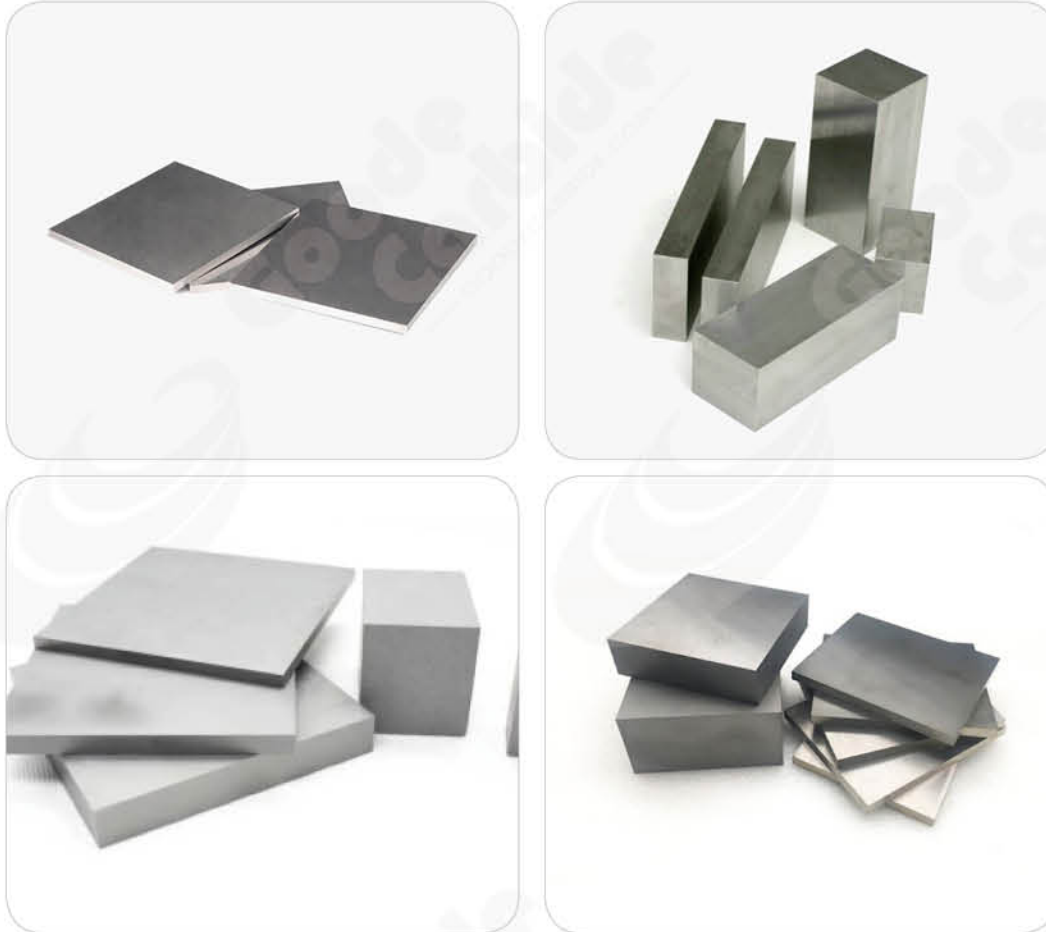
Our globally renowned portfolio of grades for metalforming and stamping is based on 30 years of research and development of tungsten carbide based materials.

Withstand Extensive EDM

Our latest grades were developed with a proprietary binder system and maintain the hardness and mechanical properties of our conventional grades. They resist the corrosion, pitting, and cracking commonly experienced during electrical discharge machining, especially in thick punches and large die segments.

Grade	Nominal Binder(%)	Grain Family	Hardness		Average TRS	
			HRA	HV30	PSI	Mpa
GD855	10	submicron	91.8	1580	420500	2900
GD466	12	fine	90.0	1360	480000	3310
GD887	15	submicron	90.2	1380	435000	3000
GD650	15	submicron	90.2	1380	550000	3790
GD750	15.5	submicron	90.7	1440	625000	4310

Note: Made-to-order blocks and preforms are available in a variety of grades for specialty applications



EDM Blocks

Unlike other carbide manufacturers, we produce our powders from the raw materials, this guarantees the highest quality tungsten carbide throughout the process and maximizes performance for the end user

Material Grades:

Grade	Grade
GD855	<p>Composition: 10% corrosion-resistant binder with submicron grain structure. Very good wear resistance with high edge sharpness but less shock resistance than higher binder grades. Excellent for EDM operations and good in non-ferrous applications.</p> <p>Application: ISO K-30 grade with ideal wear resistance in high-speed stamping, medium, thin sheets — coining brass (.010" thick), can die ironing rings, non-gummy steels, compacting dies, stamping dies for razor blades, lead frames (thin copper .030"), annealed copper, and draw dies (300 series stainless steel).</p>
GD466	<p>Composition: 12% corrosion-resistant binder with medium/fine-grain structure. Very high strength for heavy impact with low wear properties.</p> <p>Application: For standard stamping — impacting punches, coining dies, forming dies, can die punches, swaging dies, cold forming, very severe draw dies for .075" thick cold-rolled steel, piercing punches (305 stainless steel), and gummy steel.</p>
GD887	<p>Composition: 15% corrosion-resistant binder with submicron grain structure for lead frame and connector stamping. Very high strength and excellent wear resistance for medium-impact applications.</p> <p>Application: Stamping dies for razor blades, electronic stamping, lead frame dies, laminations, spring steel stampings, and coining dies (hard metal). Not recommended for stamping thick stainless steel. Use in place of CD650 for difficult to EDM parts, or if corrosive die lubricants are used.</p>
GD650	<p>Composition: Conventional 15% cobalt binder with submicron grain structure for lead frame and connector stamping. Very high strength and excellent wear resistance for medium-impact applications. Our most popular grade for general purpose stamping.</p> <p>Application: Stamping dies for razor blades, electronic stamping, lead frame dies, laminations, spring steel stampings, and coining dies (hard metal). Not recommended for stamping thick stainless steel.</p>
GD750	<p>Composition: Conventional 15.5% cobalt binder with ultra-fine submicron grain structure for lead frame and connector stamping. Very high strength and excellent wear resistance for low-impact applications.</p> <p>Application: Extremely thin punches or tools with very fine features will benefit from the ultra-fine submicron grain structure, which helps to prevent premature corner washout and maintain edge strength. Also may be used as an upgrade to CD650, due to increased hardness.</p>

READY TO MEET YOUR SPECIFIC NEEDS

We have a large selection of conventional and low-corrosion rectangular blanks in stock. Each is sinter-HIP processed and stress-relieved for optimum performance in EDM machining. Blocks are available in standard sizes, which are individually packaged for easy delivery and handling.

STANDARD BLOCKS:

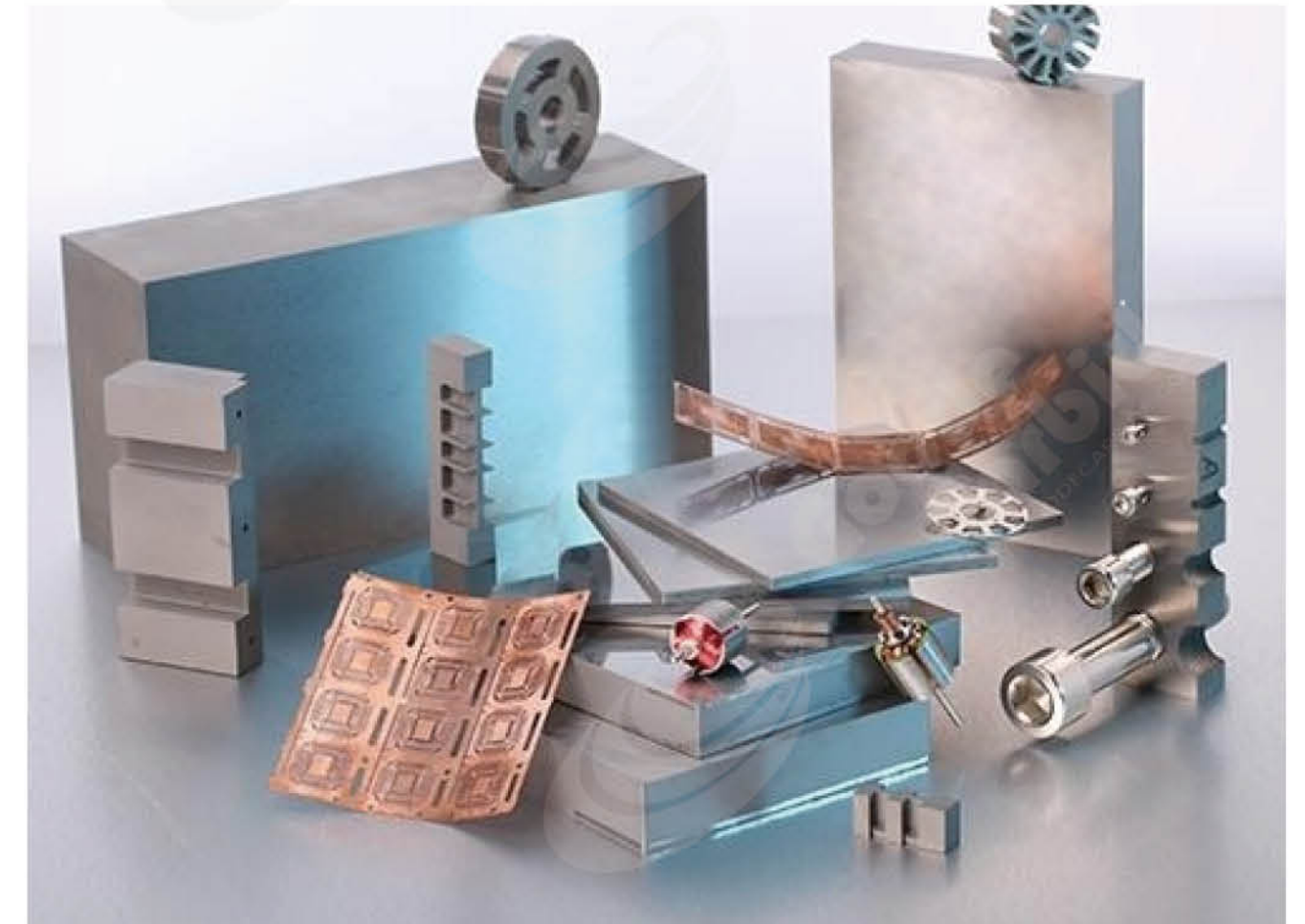
- Nominal dimensions are shown in the chart below.
- All blanks are provided with grinding allowance as shown in the tolerance chart.
- Each block is sinter HIP and stress relieved for EDM machining.

Length	Width	Thickness
200	200	15-45
150	150	15-45
150	100	15-45
150	130	15-45
150	80	15-45
120	120	15-45
100	100	15-50
100	50	15-50
100	45	15-50
80	55	10-50
80	40	10-50
70	35	5-50
45	25	3-20
35	19	5-30
20	20	5-20
18	13	5-20

Surely that we can offer any sizes upon the clients' customized requirement

SECTORS, APPLICATIONS:

- Automobile and Aerospace Connectors Stamping
- Electronics and Leadframe Stamping
- Motor Core and Silicon Steel Stamping
- Powder Metallurgy, Pot and Plunger Production
- All types of Metal Parts Stamping
- High Speed Stamping Mould Production



TOBACCO CARBIDE SLITTER BLADES

TOBACCO CIGARETTE AND FILTER PROCESSING KNIVES

Goode Carbide supplies high-tech tungsten carbide knives for tobacco processing as well as for filter cutting, film slitting and packaging of cigarettes, cigars and other products.

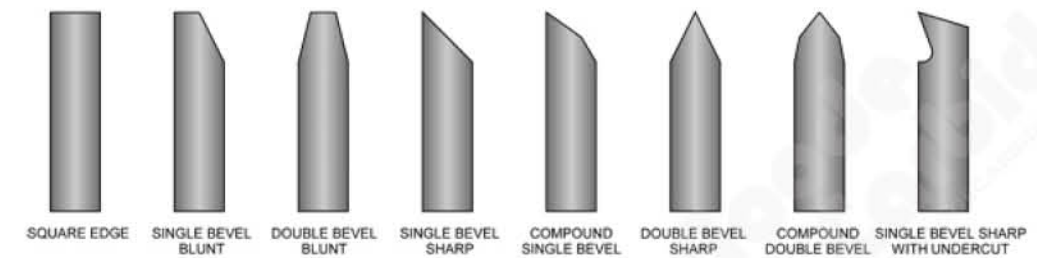


THE SPECIFICATION AS BELOW,

Dimension(mm)	ID(mm)	OD(mm)	Thickness(mm)
Dia60xDia19x0.27	19	60	0.27
Dia61xDia19.05x0.3	19.05	61	0.3
Dia63xDia19.05x0.254	19.05	63	0.254
Dia63xDia15x0.3	15	63	0.3
Dia64xDia19.5x0.3	19.5	64	0.3
Dia85xDia16x0.25	16	85	0.25
Dia89xDia15x0.38	15	89	0.38
Dia100xDia15x0.35	15	100	0.35
Dia100xDia16x0.3	16	100	0.3
Dia100xDia16x0.2	16	100	0.2
Dia100xDia15x0.2	15	100	0.2
Dia110xDia22x0.5	22	110	0.5
Dia140xDia46x0.5	46	140	0.5



EDGE BEVEL DETAILS



Standard sizes: 45mm, 60mm, 63mm and 100mm

Offered in double bevel and compound double bevel configuration with angle ranging from 10 degree to 45 degree included and anything in between.

We offer eight different grades of carbide to ensure optimum cutting action and extended tool life – unlike our competitor's "one size fits all" approach. Laser engraving is done to your requirements at no additional cost for identification and traceability purposes.

AGRICULTURE TUNGSTEN TILES



In the agriculture industry, wear is a common problem that is largely caused by ground contact causing abrasion against wear parts. When choosing wear parts, users must have understand local conditions and the environment type in order to make the right decision, as factors such as the number of ploughed hectares will affect the wear part needed.

To help reduce the effects of wear, Goode Carbide manufactures Kobide, an effective and durable wear part specifically for the agricultural industry.

Kobide is an innovative tungsten carbide composite material that offers weldable wear protection and combines high performance with easy installation.

Not only can Kobide can be used on a variety of different agricultural machines and ground-engaging tools, but it has been proven to save time and money after extensive testing in the field.

Kobide is one of the world' s hardest weldable materials and is ideal for applications involving sliding wear and in situations where brazing is not an option. As brazing techniques can decrease the wear performance of steel machinery through high heat input, Kobide is a highly useful option as it protects the lifespan of steel components and is complementary to brazed tungsten carbide edges.

Shop Kobide

It is an ideal solution for combatting sliding wear and preventing thinning or "washing" and is also well suited for situations where brazing is not an option and hardfacing is too slow. The most common machines that Kobide is typically used on include seed drills, subsoilers, cultivators, ploughs, muck spreaders, mowers, root harvesters, sugar cane harvesters, buckets, augers, and scrapers.

Kobide works most effectively when used in conjunction with conventional tungsten and when welded to the body of a part.

This is usually done behind the tungsten edge in order to improve the overall life and body of the tool. However, Kobide should not be used in above ground high speed applications such as hedge flails and topers.

When used for the correct applications, Kobide users can achieve a much greater working life and performance from wearing metal parts. As well as the increased service life, Kobide also helps to reduce downtime and save time & money on the farm as equipment does not need to be repaired as frequently.

WHERE TO USE KOBIDE

In all soil types, fit Kobide to:

- All scrapers
- Behind regular tungsten
- The sides of subsoiler legs
- The sides of cultivator legs
- The front of subsoiler shins
- Straw rake tines
- Many types of drill coulters
- Manure spreader beaters

On land with no stone, fit Kobide to:

- Power harrow tines
- Subsoiler points and wings
- Plough points and wings
- Cultivator points
- Bed tiller tines
- Beet harvester turbine tines
- Beet harvester shares
- Sugar cane harvester base cutters

Why choose Kobide

Kobide combines hardness and toughness to make it durable and crack resistant. It can also help to increase the performance and service life of parts and equipment compared to other AR steel grades.

Avoid downtime, increase part lifetime: Kobide helps avoid equipment downtime and increases part lifetime. This reduces the time spent replacing worn parts during the agricultural season and increases the uptime of machinery.

Improved farm profits: Kobide helps to reduce spend on wearing metal and avoids unplanned downtime mid-season which in turn improves profit and efficiency on-farm.

Easy to install, quick for repairs: standard MMA and MIG welding methods can be used to install Kobide tiles and Kobide can be welded to any position, where brazing tungsten or ceramics cannot be used.

Better seed establishment, better tillage quality: Thanks to the superior wear performance of Kobide, the ground engaging tool keeps its depth and profile for longer, better placing seeds and working deeper for longer.

Reduce diesel use: the attractive wear-performance: weight ratio of Kobide gives maximum wear protection without increasing weight of trailed machinery. Moreover, tools cut sharper lines and packer scrapers remove soil more efficiently when using Kobide, again reducing diesel usage.

Improved soil health: soil disturbance is kept to a minimum thanks to low-profile Kobide tiles which reduce draft whilst giving wear protection. This results in minimal soil movement.

Reduced operations costs: for manufacturers, distributors, and repairers, a small Kobide stock can be used for a wide range of parts. This reduces cost held in stocks.

Protect investment: Kobide is successfully welded behind brazed tungsten edges, greatly increasing the overall life of the part and achieving maximum output from the brazed tungsten.

Kobide is built to withstand the toughest conditions

No matter what soil conditions you work in, Kobide stays strong against even the most severe abrasive conditions. Kobide has been proven in the field as being an abrasion-resistant composite of choice that can help improve the service life of parts and equipment.

Kobide's performance isn't just at surface level. Hardness and durability run all the way through Kobide wear parts.

Kobide's toughness isn't just at surface level. Hardness and durability run all the way through Kobide wear parts.

Whatever you need Kobide for, you'll find a range of dimensions to suit your application.

Quality and Testing

You can trust that all Kobide parts are manufactured to high quality standards and every production batch is thoroughly checked by a team of Quality Inspectors and tested for dimensional accuracy and hardness levels. Further, samples from each batch undergo abrasive wear ASTM G65 testing to ensure consistent wear resistance.

We also use on-site laboratory equipment to ensure that all Kobide components have the necessary micro-structures needed to cope in the environments that they are used in.

Kobide has more than six successful years in the field to prove real-life performance and long-term material reproducibility. Every batch of Kobide is tested in our technical centre to maintain highest quality standards. Regular mechanical testing includes various wear testing methods.

Sizes

Kobide can be produced in bespoke shapes and dimensions according to customer requirements. The standard low-profile tile dimensions are as follows:

4mm thick – 8 x 40 mm – 15 x 40 mm – 25 x 60 mm – 40 x 40 mm

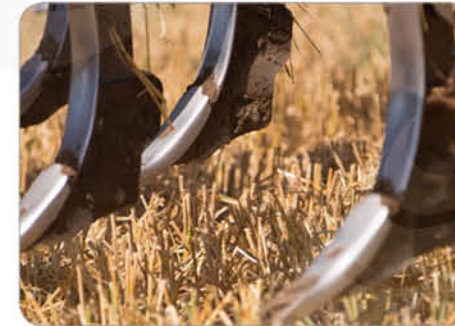
6mm thick – 15 x 40 mm – 25 x 60 mm – 40 x 40 mm

8mm thick – 15 x 40 mm – 25 x 60 mm – 40 x 40 mm

The following assemblies are available as standard:

15x200mm / 25x180mm / 40x200mm / 200x200mm

Kobide tiles can also be supplied with studs welded, or on steel-backing for added impact resistance.



TUNGSTEN HEAVY ALLOY

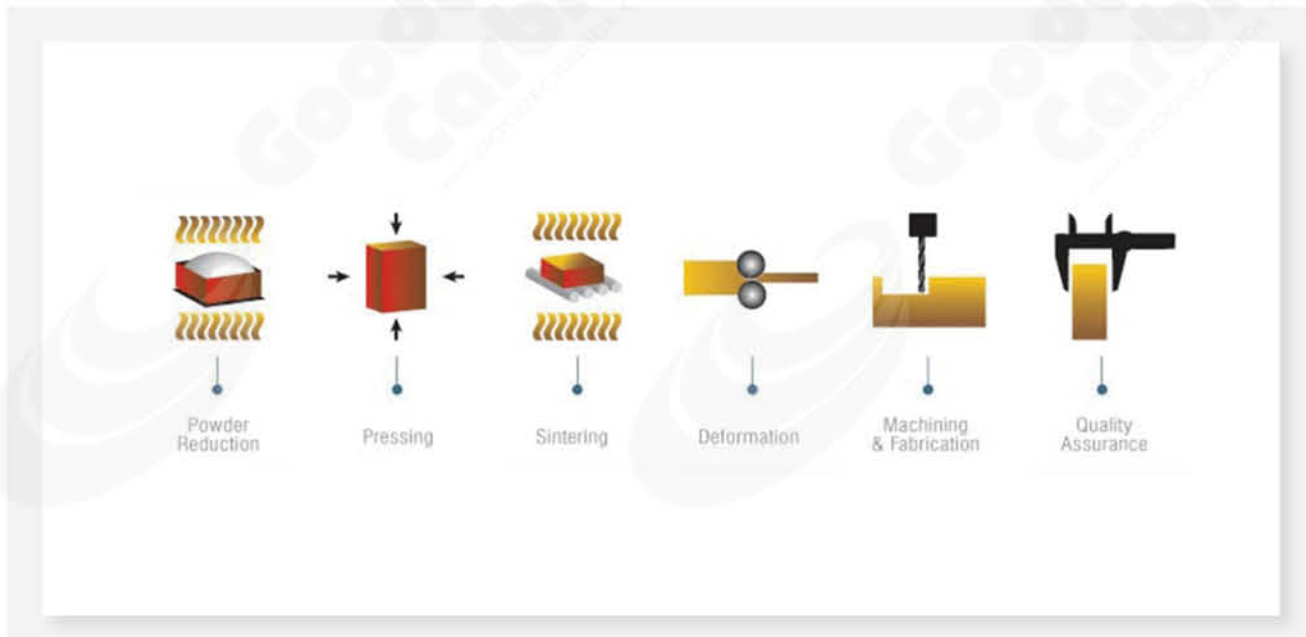


CHINA Made Tungsten Heavy Alloy (WHA). GOODE CARBIDE is a 100% CHINA owned, fully integrated, leading producer of high-quality tungsten heavy alloy material and finished parts. GOODE CARBIDE is ISO, AS9100, registered and a qualified supplier to many Tier 1/2 aerospace and defense contractors that leverage our specialty tungsten material as balance weights, flight hardware, and munition subcomponents. Our tungsten heavy alloy meets all ASTM B-777, AMS 7725E, requirements.

GOODE CARBIDE Technologies presses and sinters high-quality tungsten heavy alloy (WHA) blocks, rods, and shaped parts. Sintered WHA blanks can be further rolled or swaged by GOODE CARBIDE to produce plates, sheets, and rods with ultimate tensile strengths exceeding 180 ksi (1240 MPa) and elongations exceeding 5%. GOODE CARBIDE also precision machines WHA parts for use as ballast weights, radiation shields, boring bars, ordnance components, and other components that require high density and good ductility.

GOODE CARBIDE produces its own pure tungsten powder at its facility in ZHUZHOU, HUNAN and has large blending and alloying capabilities.

OUR POWDER METALLURGY PROCESS



APPLICATIONS FOR TUNGSTEN HEAVY ALLOY (WHA):

Balance Weights for turbines, crankshafts, and helicopter rotors

Inertial damping weights for aircraft control surfaces

Weights for aircraft, missiles, boats, and race cars

Kinetic energy penetrators

Radiation Shielding, radioisotope containers, and collimators for high energy x-ray systems in scientific, industrial, medical, and homeland security applications

Low chatter, high stiffness boring bars and tool holder for metalworking

High-density instrument casings for downhole formation logging in oil/gas wells

Vibration Dampening Weights

WHAT BENEFITS ARE ASSOCIATED WITH WHA?

Strength proportionate to many medium carbon steels

Machinable with routine shop tools and techniques

High elastic stiffness

Low CTE in combination with relatively high thermal conductivity

Low toxicity, low reactivity surface character

Can be manufactured in a wide range of sizes and shapes

Environmentally friendly

Chemical Composition and As-sintered Mechanical Properties

STANDARD GRADES

Grade	ET90	ET90NM	ET92.5	ET92.5NM	ET93
ASTM B-777	Class 1	Class 1	Class 2	Class 2	—
AMS 7725E	Class 1 Type 2	Class 1 Type 1	Class 2 Type 2	Class 2 Type 1	—
MIL-T-21014D	Class 1	Class 1	Class 2	Class 2	—
W content, wt. %	90	90	92.5	92.5	93
Ni content, wt. %	7.0	8.9	5.3	6.7	5.6
Fe content, wt. %	3.0	1.1	2.2	0.8	1.4
Density, g/cm ³	17.0	17.0	17.5	17.5	17.7
UTS, ksi	≥ 110	≥ 110	≥ 110	≥ 110	≥ 110
UTS, MPa	≥ 758	≥ 758	≥ 758	≥ 758	≥ 758
YS, ksi	≥ 75	≥ 75	≥ 75	≥ 75	≥ 75
YS, MPa	≥ 648	≥ 648	≥ 648	≥ 648	≥ 648
Elongation, %	≥ 5	≥ 5	≥ 5	≥ 5	≥ 5
Hardness, HRC	≤ 32	≤ 32	≤ 33	≤ 33	≤ 33
Mag. perm.	> 1.05	≤ 1.05	> 1.05	≤ 1.05	> 1.05

PRODUCTS SPECIFICATIONS:

Tungsten Heavy Alloy Rods	Dia.3.0 to Dia.400 mm Length: 20-2000mm	They are used for the counterweights, radiation shieldings, military industry, dart rod, welding rod, mould etc.
Tungsten Heavy Alloy Slugs		They are used for automobile and vehicle weight balance, oil drilling machine counterweights, helicopter weights, ship weights and tank counterweights
Tungsten Heavy Alloy Bars	Width:2.0-100.00 mm Length: 2.0-100.00mm Height: 50-1000mm	They are used as counterweights on aircraft surfaces control, propeller, navigation station, the engine and engine crankshaft
Tungsten Heavy Alloy Blocks	Length: 810mm(max) Width: 400mm(max) Thickness:400mm(max)	They can be made into weapon parts, molds and counterweights, also widely used in the medical field, such as shielding wall, shielding block on the CT device
Tungsten Heavy Alloy Plates		They can be used as counterweights in various fields, such as mechanical hammer, fly weight, oil drilling platform counterweight, and shockproof tool holder. also they can be used for the X ray target, collimator, nuclear fuel container, the needle shielding etc.
Tungsten Heavy Alloy ring		They can be used as counterweights in various fields
Tungsten Heavy Alloy Pipes	Outer Dia.6~150mm Inner Dia.3~120mm Length:20~600mm	They are the best material for radiation shielding, which can also be used for the pendulum for the clock and automatic watch balances, shockproof knife tools, flywheel weight etc.
Tungsten Heavy Alloy Balls	Dia.2.0 -160 mm	

*Other sizes and properties available as special order

PRESSED AND SINTERED PARTS:

Goode Carbide has industry-leading expertise and experience in pressing and sintering ASTM B-777 material. We offer both round and rectangle parts in the pressed and sintered state – which helps reduce cost to our customers.

Leading companies purchase Goode Carbide-made tungsten heavy alloy material for applications such as ballast weights, radiation shields, boring bars, ordnance components and other components requiring high density and good ductility.

PRESSED AND SINTERED MACHINED PARTS:

Goode Carbide has industry-leading expertise and experience in pressing, sintering, and machining ASTM B-777 material. We can supply material finished to your drawing requirements. Goode Carbide produces finished parts for medical equipment manufacturers, balance weights for aircraft, Vibration dampening weights for helicopter rotors to name a few current applications.

WHA HOT SWAGED RODS WITH ENHANCED MECHANICAL PROPERTIES:

Goode Carbide is a leader of providing Tungsten Heavy Alloy (WHA) hot swaged rod material with enhanced properties. Goode Carbide can adjust swaging and heat-treating conditions to produce WHA rods with specific combinations of strength and ductility.

Swaged Rods are produced in diameters $<.25"$ to $>1"$ based on customer requirements.

WHA rods are swaged and cut to size to customer-specified thickness, length, surface finish as well as other material properties. We also offer high volume, precision machining, threading, and gun-drilling services. As with all of our materials, our rod begins as metal powder, pressed into ingots, sintered, and then swaged and drawn down. Our advanced drawing / swaging process enables us to tailor the product to meet specific customer material and performance requirements to ensure optimal performance in your application.

Other alloy compositions and properties may be available as a special order.

WHA HOT ROLLED PLATE AND SHEET PRODUCTS:

Goode Carbide has been hot rolling pure tungsten and molybdenum for over 30 years and is the only China-owned tungsten producer with hot rolling capabilities. Goode Carbide offers a range of tungsten heavy alloy plate and tungsten heavy alloy sheet products in varying thickness and length and per our customer request. As with all of our materials, our WHA plate and sheet begins as metal powder, is pressed into ingots, sintered, and then rolled. The process enables us to tailor the product to meet specific customer material and/or performance requirements to ensure optimal performance in your application.

HOT ROLLED WHA PLATE AND SHEET STANDARD SIZES:

$.080"$ to $1"$ thick. Widths and lengths available up to $24"$

Tungsten Heavy Alloy Form Factors

Goode Carbide manufactures tungsten heavy alloy in various forms—from WHA blocks, rods (sintered or swaged)

