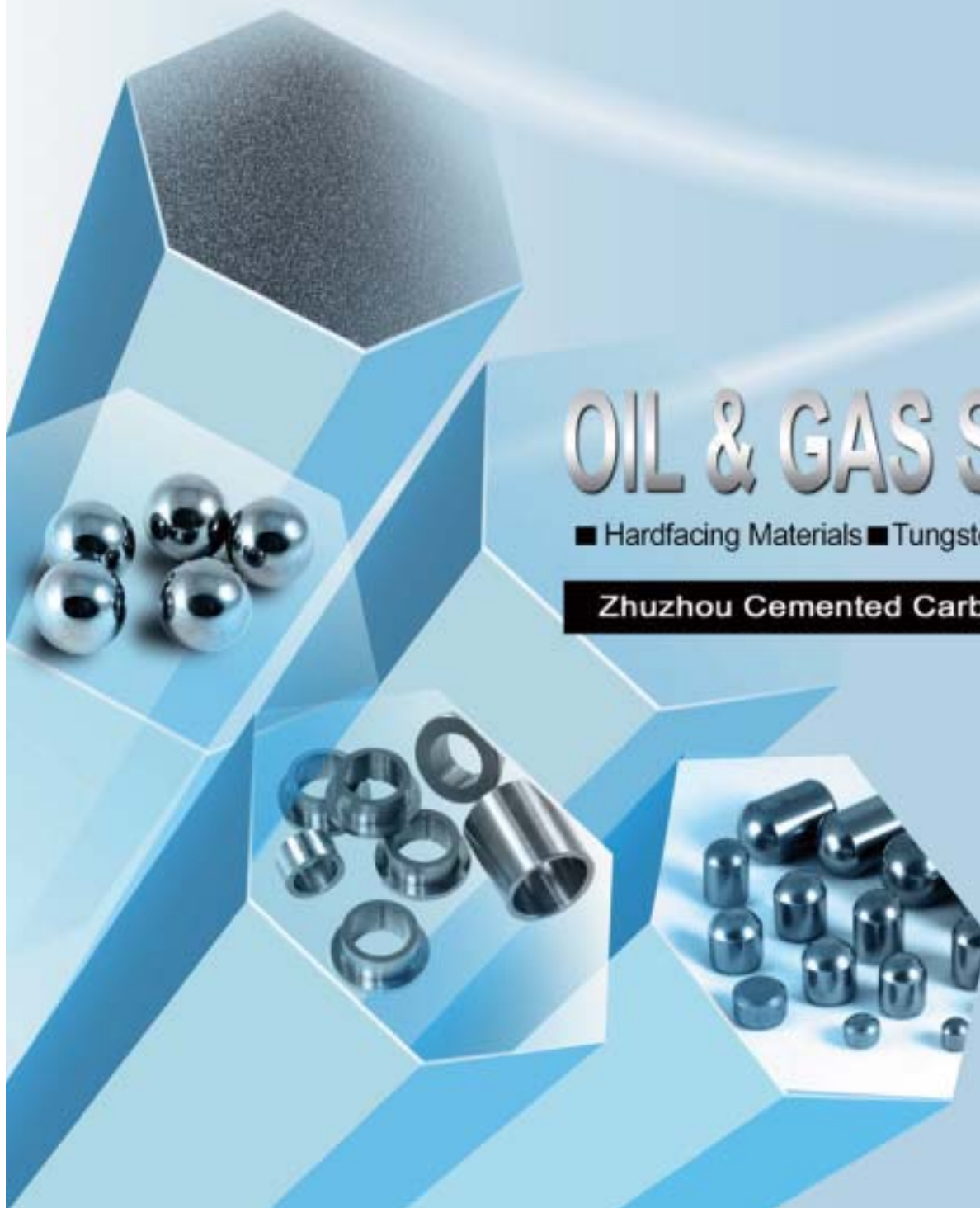




# OIL & GAS SOLUTIONS

■ Hardfacing Materials ■ Tungsten Carbide Inserts ■ Wear Parts

Zhuzhou Cemented Carbide Group Corp. Ltd.





# Profile

**Key Philosophy:**  
Good Faith Creating Value

**Enterprise Spirit:**  
Pursuing a Perfect Mastery  
Making Limitless Progress

**Zhuzhou Cemented Carbide Group Corporation Ltd.**(Abbreviated as ZCC), as one of the China's 156 key projects constructed in the nation's "First Five-Year Plan", is now a council member of ITIA. The corporation, after more than 50 years of development, has come up as China's biggest base both for tungsten smelting and for the production, scientific research, sales and export of cemented carbide and its compatible tools.

It mainly engages in the production and sales of 6 series of "Diamond" Brand products entitled as China's renowned brand, such as cemented carbide, tungsten, molybdenum, tantalum, niobium and cobalt.





Certificate



## Hardfacing Materials

Cast tungsten carbide powder

Grade: YZF

Appearance: Silver grey powder

Application: Widely used in spray welding, immersion and spray coating.



### Chemical composition %

W	Total C	Free C	Fe	Cr
Balance	3.8-4.1	≤0.1	0.3-2.0	≤0.2
V	Ta+Nb+Ti	Ni,Co,Mo, etc		
≤0.2	≤0.2	≤0.5		

### Physical and mechanical properties

Hardness HRA	Micro hardness Kg/mm <sup>2</sup>	TRS Kg/mm <sup>2</sup>	Apparent Density g/cm <sup>3</sup>	Melting Point °C
93-93.7	2500-3000	48.2	16.5	2525

## Cast tungsten carbide powder

Grade	Grain sizes
YZF	10 x 20 mesh
YZF	20 x 30 mesh
YZF	30 x 40 mesh
YZF	40 x 60 mesh
YZF	60 x 80 mesh
YZF	80 x 100mesh
YZF	100 x 230 mesh
YZF	100 x 325 mesh
YZF	70 x 100 mesh
YZF	100 x 140 mesh
YZF	140 x 200 mesh
YZF	200 x 400 mesh
YZF	-325 mesh

We can supply different mesh sizes what required by customer



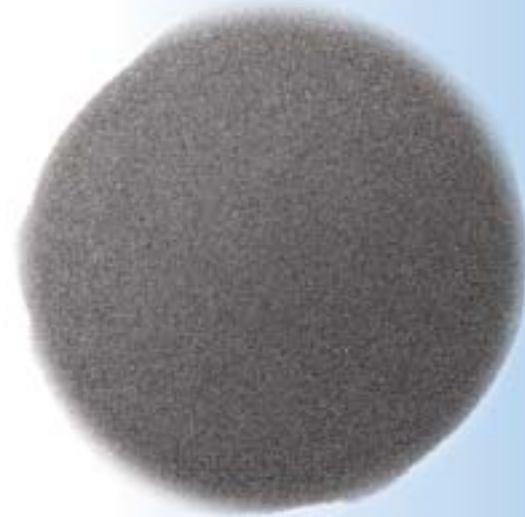
## Hardfacing Materials

Spherical cast tungsten carbide powder

Grade :Spherical CWC

Appearance : Dark grey powder

Application : Widely used for exploiting drill bits, PDC drill tools, melting and penetrating spray coating and overlay welding on wear surface.



### Chemical composition %

W	T.C	F.C	Ti	Mo+Co+Ni	Cr	V	Si	Fe	O
Balance	3.8-4.1	≤0.08	≤0.1	≤0.2	≤0.1	≤0.05	≤0.02	≤0.5	≤0.05

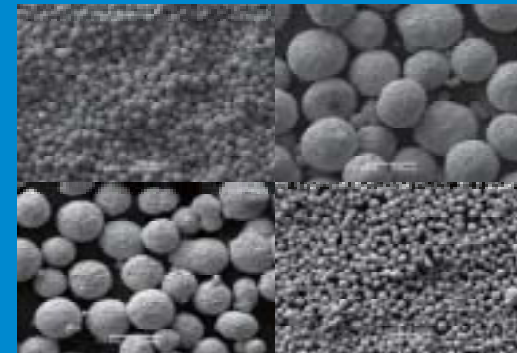
### Physical Properties

Mesh size	Size range(mm)	Apparent Density (g/cm <sup>3</sup> )	Microhardness (Kg/mm <sup>2</sup> )
60-80 mesh	0.25-0.18	15.8-16.7	2700-3300
60-100 mesh	0.25-0.15		
100-200 mesh	0.15-0.075		
200-325 mesh	0.075-0.045		
100-325 mesh	0.15-0.045		
-325 mesh	-0.045		

# Hardfacing Materials

## Thermal spray powder

ZCC is one of the premier suppliers of thermal spray powder in China. With advanced facilities and technologies, we are dedicated to developing innovative powders for a growing market. An ISO9001 approved system assures our products can be produced with exceptional quality and meet various thermal sprayed requirement.



## Tungsten carbide based powder

	Name	Chemical	Size	Density ,Hall Flow
WC-6Co	YG6	Co 6.0 WC 94.0	80 X 325mesh	7.6g/cm <sup>3</sup> 11s/50g
WC-12Co	YG12	Co 12.0 WC 88.0	100 x 325mesh 270 x 325mesh	5.3G/cm <sup>3</sup> 12 S/50g
WC-17Co	YG17	Co 17.0 WC 83.0	270 x 325mesh -45um+15um	5.4g/cm <sup>3</sup> 12 S/50g
WC-10Ni	YN10	Ni 10.0 WC 90.0	-45um+15um	11S/50g 5.2g/cm <sup>3</sup>
WC-10Co-4Cr	YG10Cr4	Co 10.0 Cr 4.0 WC 84.0	-45um+15um	5.4g/cm <sup>3</sup> 12 S/50g



## Hardfacing Materials

### Macro tungsten powder

#### Chemical composition %

W	O	Ti	Ni	Fe	Mo	Al
Balance	0.05	0.001	0.02	0.03	0.001	0.001
Mg	Ca	Co	Cr	Cu	Si	K
0.001	0.01	0.01	0.001	0.01	0.01	0.004

Note : Tungsten content is calculated by the subtractive method in percentage of weight

#### Physical Properties

Item	
Apparent Density	7.3-8.9g/cm <sup>3</sup>
Tap Density	9.0-10.5g/cm <sup>3</sup>
Hall Flow	≤12s/50g
Fsss	>30um
Mesh size	60-325mesh

Grade :Macro W

Appearance : Bright grey powder

Application : For making diamond drill bits and thermal spraying materials



# Hardfacing Materials

## Macro tungsten carbide powder

Grade :Macro WC

Appearance : Light grey powder

Application : It is a kind of cemented carbide material as substantial material for mining and geological prospect.



### Chemical composition %

W	T.C	F.C	Ni	Co	Ti	Ta	Nb	Si	Fe
Balance	6.1-6.2	≤0.06	2.5-5.5	2.5-5.5	≤0.15	≤0.03	≤0.03	≤0.02	≤0.25

### Physical Properties

Mesh size	Size range(mm)	Apparent Density (g/cm <sup>3</sup> )	Microhardness (Kg/mm <sup>2</sup> )
40-60 mesh	0.425-0.25	6.6-7.4	1600-1900
60-80 mesh	0.25-0.18	6.6-7.2	
80-200 mesh	0.18-0.075	6.4-7.0	
200-400 mesh	0.075-0.038	6.0-6.6	
-325 mesh	<0.045	5.8-6.4	

## Tungsten Carbide Inserts

ZCC is making consistent efforts to meet dynamic demands of customers in oil and gas industries, developing new carbide grades and geometries to satisfy diverse applications.

### Major tungsten carbide grades

Grade	Cobalt %	Density g/cm <sup>3</sup>	Hardness HRA	Grain Size μm	Descriptions/ Applications
YK05	6	14.90-15.0	90.0-91.20	2.4	Medium Coarse, wear resistant
KD10	6.5	14.85	90.0-91.2	2.0	Medium grade, wear resistant
KD20T	8	14.64 - 14.84	89.1 - 89.9	2.0	Medium size and wear resistant
KD30T	10	14.43-14.63	88.12-89.1	2.0	Wear parts
YG11C	11	14.20~14.40	86.5-87.8	3.0	Wear parts
KD40	10	14.4~14.6	86.0-87.0	2.4	For the gauge row in roller bits drilling in medium hard formations.
KD45	12	14.23 - 14.43	86.8 - 87.6	2.4	Medium coarse grade in hard formations.
KD50	14.8	13.95-14.12	85-85.8	2.4	Medium coarse grade in hard formations
KD60	16	13.8~14.1	84.5-85~5	2.4	Medium coarse grade in hard formations.
KD60T	16	13.90	86.6 - 87.4	2.0	Medium grade in medium hard to soft formations.
KE20	13	14.10~14.30	88.0~89.5	1.2~1.6	Applicable to oil fields or blade diamond composite substrate
JF10.1	11.5	14.25~14.55	87.0-88.2	1.6~2.0	Applicable to oil fields or blade diamond composite substrate
JF30.1	13	14.10~14.30	87.0-98.2	1.2~1.6	Applicable to oil fields or blade diamond composite substrate

## Tungsten Carbide Inserts

The chisel and sculptured inserts, standard or special designed, with a aim to optimize performance considering both strength and breakage.





## Tungsten Carbide Inserts

Semiballistic or domed inserts with great variety of protrusion design can be applied to different formations.

## Tungsten Carbide Inserts

Flat and serrated inserts are used to reduce wear on the steel surface with multiple choices available.



## Tungsten Carbide Inserts

Conical and Parabolic inserts for percussive hammer bits, or roller cone bits in tough drilling conditions.





## Tungsten Carbide Inserts

Substrates material for PDC cutters are produced and supplied according to specific customer design, to meet the tough impact conditions.



## Wear Parts

Carbide Balls, carbide bushing and sleeves. They are mainly used for the sealing of valves of oil pumps in petroleum industry's sand containing wells, oil wells, sea oil wells and high pressure sulfur resistant oil wells, etc.

High strength, high wear resistance, high precision, high temperature resistant, corrosion resistant.



Carbide sleeve & bushing

Grade	Cobalt Content %	Density g/cm <sup>3</sup>	Hardness HRA	TRS N/mm <sup>2</sup>	Grades Descriptions/Applications
YG6X	6	14.90	91.5	1800	They are mainly used for the sealing of various valves of oil pumps in petroleum industry.

# Wear Parts

## Carbide ball

Grade	Cobalt Content %	Density g/cm <sup>3</sup>	Hardness HRA	TRS N/mm <sup>2</sup>	Grades Descriptions/Applications
YG13	13	14.20	88.0	2200	They are used with compatible cemented carbide valve seats.
YN15	15 (Co+Ni)	9.00	90.0	1500	





## Wear Parts

Carbide nozzle

Grade	Cobalt Content %	Density g/cm <sup>3</sup>	Hardness HRA	TRS N/mm <sup>2</sup>	Grades Descriptions/Applications
YG6	6	14.90	91.0	1750	Carbide nozzle has been widely used in sand blasting and shot peening equipment.







**Headquarter:** Zhuzhou Cemented Carbide Works Import & Export Company  
4/5F Diamond building, Diamond road, Zhuzhou Hunan China  
Tel: 0086-731-28264008 28265299 28265345 28263294  
28265206 28261443 28264222 28261490  
Fax: 0086-731-28222044 28281344  
Web Site: <http://www.chinacarbide.com>  
E-mail: [zccc@chinacarbide.com](mailto:zccc@chinacarbide.com)

**USA:** Zhuzhou Cemented Carbide Works USA Inc.  
4651 P a 11 Lane  
Fm F1101, Ind. 48108  
Te 734-302-0125  
Ema: SalesDepartment@zcccamericas.com

**Europe ZCC Europe GmbH**  
Heinrichstrasse 169A D-40239 Düsseldorf, Germany  
Tel: 0049-211-23039150  
Fax: 0049-211-23039139  
E-mail: [xuyulang@zcc-europe.com](mailto:xuyulang@zcc-europe.com)

## How to find us

**Hong Kong:** Zhuzhou Cemented Carbide Group Hong Kong Co Ltd  
Flat E, 19/F Block 4 Nam Fung Sun Chien 38 Greig Road,  
Quarry Bay, Hong Kong  
Tel: 00852-28151831 Fax: 00852-28151821  
E-mail: [huxiang@hkcarbide.com.hk](mailto:huxiang@hkcarbide.com.hk)

**India: India Liaison Office**  
1007/1008, BLDG-4, Rajeev Classique Complex 01 Link Road,  
Beside India Mail, Andheri(W), Mumbai, India, PC 400053  
Tel: 0091 9892616688 9067626676  
E-mail: [zhujj@chinacarbide.com](mailto:zhujj@chinacarbide.com)