



ZHUZHOU CEMENTED CARBIDE WORKS USA INC.

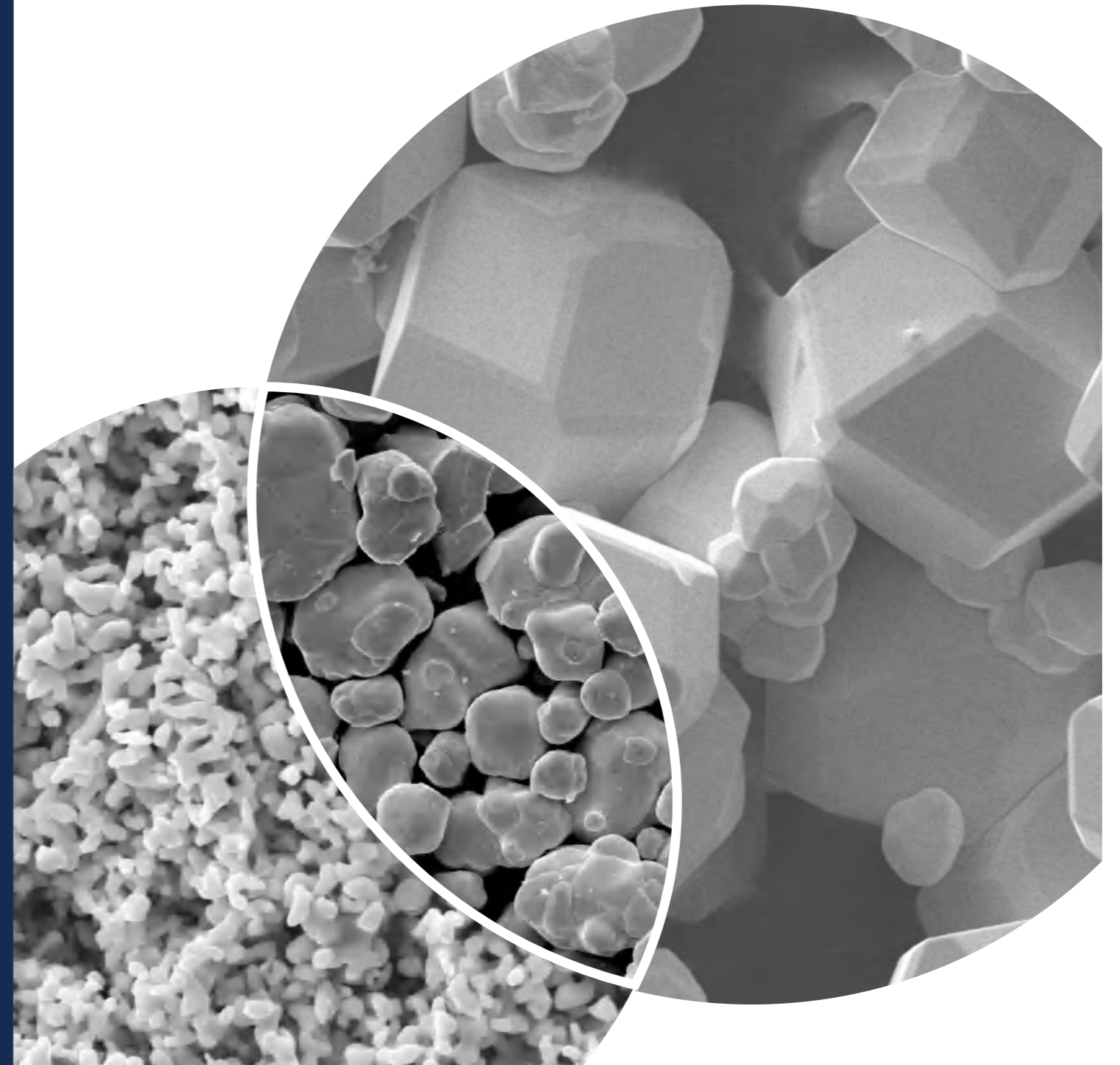
ZCC America

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2023 VERSION

METAL POWDERS



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Zhuzhou Cemented Carbide Group Co., LTD (ZCC), hailed as “the cradle of China's cemented carbide industry”, is one of the 156 key projects constructed during the First Five-Year Plan. ZCC is a key enterprise of China Minmetals Corporation, one of the Fortune Global 500 companies.

ZCC specializes in cemented carbides, which are known as “the teeth of industry” and are widely applied to military industry, aerospace, mechanical processing, metallurgy, petroleum drilling, mining tools, electronic communication, construction, among other fields.

ZCC is a leading enterprise in the cemented carbide industry with the largest production and sales scale in China. It is also a “world-class professional leading demonstration enterprise” awarded by China’s State-owned Assets Supervision and Administration Commission of the State Council (SASAC). It is also a national manufacturing champion demonstration enterprise, a national technological innovation demonstration enterprise, a high-tech enterprise, and a national green factory. On March 21, 2023, Chinese Premier Li Qiang, also a member of the Standing Committee of the Political Bureau of the Communist Party of China Central Committee, fully approved ZCC’s work in sci-tech innovation and product development during his visit.

QUALITY ASSURANCE

ZCC always adheres to the quality policy of "laying emphasis on technology, being strict with management, and placing quality on top priority to meet customers' requirements with the Diamond brand". ZCC has acquired certificate of QHSE management system (quality, health and safety, and environment). ZCC has been adhering to the concept of "all for the customers" by respecting customers' requirements, and constantly improving technical and market services.



THE SMART PRODUCTION LINE



The smart production line of medium-coarse tungsten carbide powder was put into operation on December 28, 2021, covering an area of about 15,000 square meters, with an annual output value of about 1.5 billion yuan, and the output per capita increased from 30 tons per year to 120 tons per year, with a significant increase in labor efficiency.

The production line realizes full automation: Digitization of production control by MES system, unmanned material flow by AGV system, and heating and cooling by waste heat of equipment for the first time in the industry, which opens a new chapter of digitized, smart and green production for ZCC Group

Brand-new design of the factory

- 1F - Equipment
- 2F - Material

Automate, Digitized and Smart Production line

- AGV trolley operation
- MES system

All single equipment has been automated, and installed with data collectors, so that we can collect and analyze data and give feedback on equipment operation, material status, process quality, production data and energy consumption on site through the MES system.

Green production

No electric air conditioner on the production line, the waste heat from the equipment is collected for heating in winter and cooling in summer, thus reducing the carbon footprint of the factory so as to realize “carbon peaking and carbon neutrality” goals.

Green and environmental protection / Physical and mental health of employees

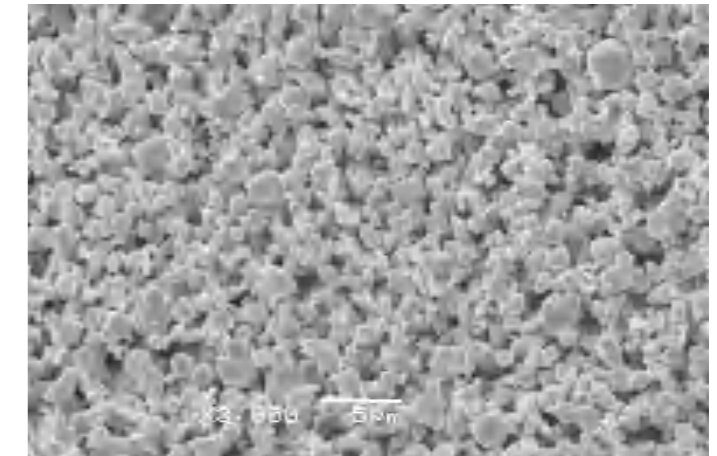


TUNGSTEN METAL POWDER

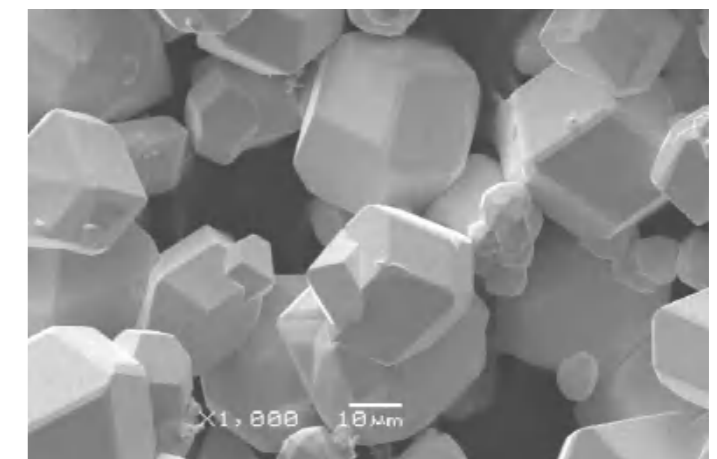


Type	Grade	F.S.S.S	O
		(μm)	(%)
Ultra-fine	04	BET: <0.10	≤ 0.60
	06	BET: 0.10-0.20	≤ 0.50
	08	Fsss: 0.80-1.00	≤ 0.40
Fine	10	Fsss: 1.00-1.50	≤ 0.18
	15	Fsss: 1.51-2.00	≤ 0.15
	20	Fsss: 2.01-2.50	≤ 0.10
	25	Fsss: 2.51-3.00	≤ 0.08
Medium	30	Fsss: 3.00-3.50	≤ 0.06
	35	Fsss: 3.51-4.00	≤ 0.06
	40	Fsss: 4.01-5.00	≤ 0.05
	50	Fsss: 5.01-6.00	≤ 0.04
	60	Fsss: 6.01-7.00	≤ 0.04
	70	Fsss: 7.01-10.00	≤ 0.04
Coarse	100	Fsss: 10.00-15.00	≤ 0.03
	150	Fsss: 15.01-20.00	≤ 0.03
	200	Fsss: 20.00-30.00	≤ 0.03
	300	Fsss: >30.00	≤ 0.03

Element	Typical
	(%)
C	≤ 0.0030
S	≤ 0.0010
K	≤ 0.0015
Na	≤ 0.0015
P	≤ 0.0010
Fe	≤ 0.0050
Al	≤ 0.0010
Si	≤ 0.0010
Mn	≤ 0.0010
Mg	≤ 0.0007
Ni	≤ 0.0030
Ti	≤ 0.0010
V	≤ 0.0010
Co	≤ 0.0010
As	≤ 0.0010
Pb	≤ 0.0001
Bi	≤ 0.0001
Sn	≤ 0.0001
Cd	≤ 0.0001
Sb	≤ 0.0005
Cu	≤ 0.0005
Ca	≤ 0.0020
Mo	≤ 0.0030
Cr	≤ 0.0030

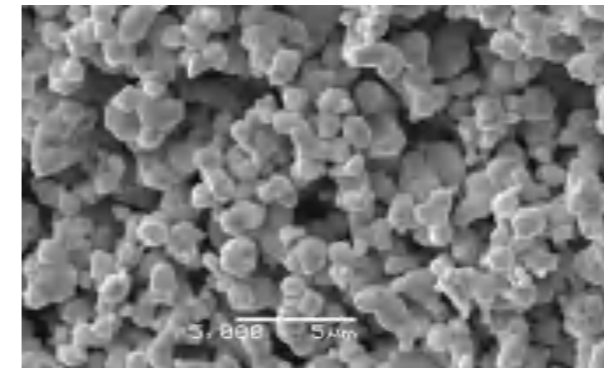


SEM Mircograph
Tungsten Metal Powder (Fine)

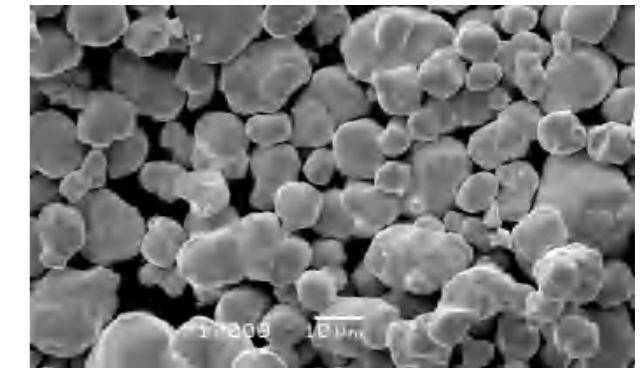


SEM Mircograph
Tungsten Metal Powder (Fine)

TUNGSTEN CARBIDE POWDER



SEM Mircograph
Tungsten Carbide Powder (Fine)



SEM Mircograph
Tungsten Metal Powder (Coarse)

Type	Grade	F.S.S	O
		(μm)	(%)
Ultra-fine	04	BET: 0.200-0.270	≤ 0.20
	06	BET: 0.271-0.360	≤ 0.18
	08	Fsss: 0.80-1.00	≤ 0.16
Fine	10	Fsss: 1.00-1.50	≤ 0.12
	15	Fsss: 1.51-2.00	≤ 0.10
	20	Fsss: 2.01-2.50	≤ 0.08
	25	Fsss: 2.51-3.00	≤ 0.08
Medium	30	Fsss: 3.00-3.50	≤ 0.06
	35	Fsss: 3.51-4.00	≤ 0.06
	40	Fsss: 4.01-5.00	≤ 0.05
	50	Fsss: 5.01-6.00	≤ 0.04
	60	Fsss: 6.01-7.00	≤ 0.04
	70	Fsss: 7.01-9.00	≤ 0.03
Coarse	90	Fsss: 9.01-13.00	≤ 0.03
	130	Fsss: 13.01-15.00	≤ 0.03
	150	Fsss: 15.01-20.00	≤ 0.03
	200	Fsss: 20.00-30.00	≤ 0.02
	300	Fsss: >30.00	≤ 0.02

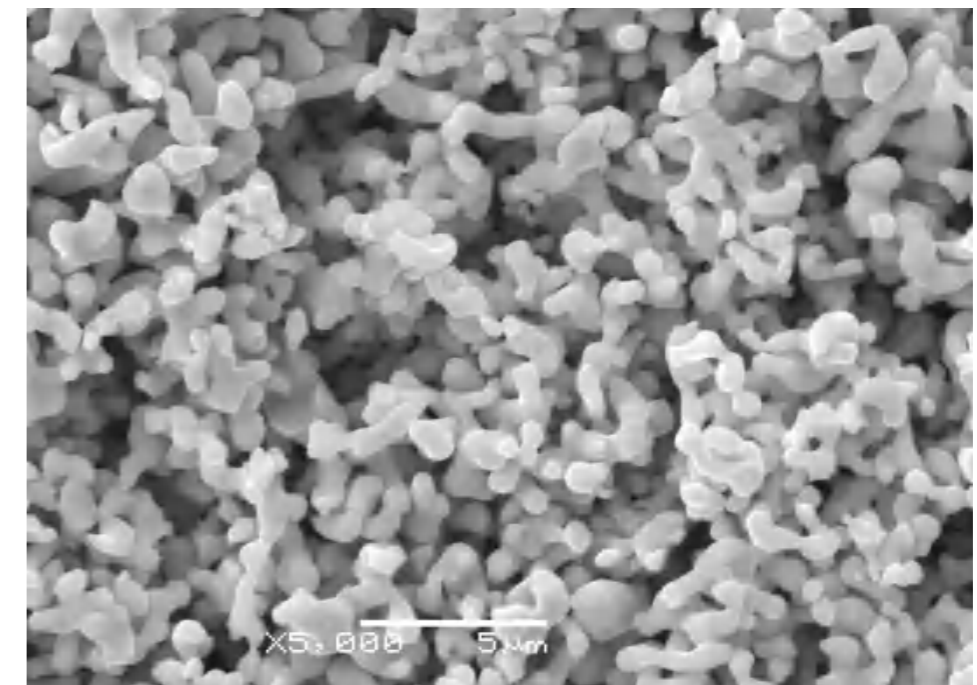
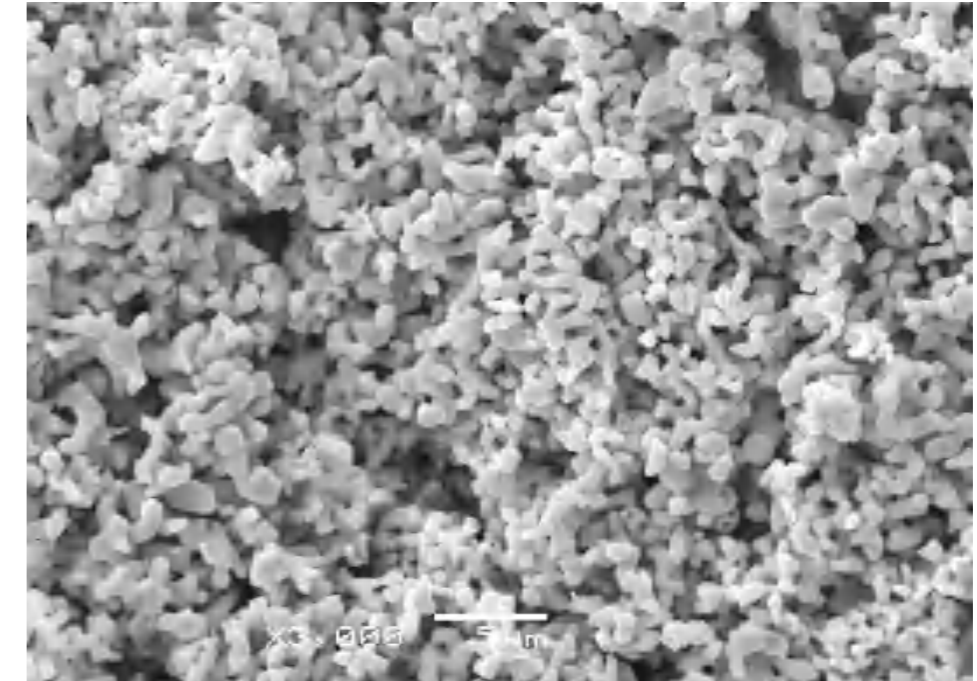
GRADE		FWCD	FWCG	Special Requirements
Carbon	Total	5.95 \pm 0.05	6.13 \pm 0.05	①Type 04CT:(6.2-6.3)%, Uncombined: $\leq 0.20\%$, Combined: $\geq 6.10\%$; ②Type 06CT:(6.15-6.25)%, Uncombined: $\leq 0.15\%$, Combined: $\geq 6.08\%$; ③Type 08CT:(6.08-6.18)%, Uncombined: $\leq 0.07\%$.
	Combined	-	≥ 6.07	
	Uncombined	≤ 0.05	≤ 0.06	
ELEMENT	S	≤ 0.0010	-	
	K	≤ 0.0010	-	
	Na	≤ 0.0010	-	
	P	≤ 0.0010	-	
	Al	≤ 0.0010	-	
	Si	≤ 0.0015	-	
	Mn	≤ 0.0010	-	
	Mo	≤ 0.0030	-	
	Ni	≤ 0.0050	-	
	Mg	≤ 0.0007	-	
	Co	≤ 0.0050	-	
	As	≤ 0.0010	-	
	Ca	≤ 0.0020	-	
	Cu	≤ 0.0010	-	
	Cr	≤ 0.0200	Type 04:(0.28-0.60)%	
	Fe	≤ 0.0200	Type 130-Type 300 Fe: $\leq 0.040\%$	
V	≤ 0.0010	Type 04:(0.2-0.5)%		

COBALT POWDER



Grade	F.S.S.S	O
	(μm)	(%)
FCo04	0.41 ~ 0.60	1.0
FCo06	0.61 ~ 0.80	0.9
FCo10	1.01 ~ 1.50	0.55
FCo15	1.51 ~ 2.00	0.50
FCo20	2.01 ~ 3.00	0.50

IMPURITIES	TYPICAL
	(%)
Ni	0.030
Fe	0.008
Ca	0.008
Cu	0.008
Zn	0.008
Mn	0.008
Mg	0.008
Al	0.008
Na	0.008
Pb	0.005
Si	0.008
C	0.050
S	0.005



SEM Mircograph
Cobalt Powder



SOCIAL RESPONSIBILITY

Focusing on the new development landscape featuring carbon peaking, carbon neutrality, and dual circulation, China Minmetals actively expands new standards, new technology, green energy, and digital intelligence, and continuously promotes intelligent, efficient, green and low-carbon development. It creates a more optimized lifestyle, and contributes to China's high-quality and sustainable development.

ZCC Group has been once again recognized as an environmental credit and integrity enterprise in Hunan Province. In accordance with people-orientated management philosophy, ZCC empowers the staff, provides quality service for customers and makes contributions to building a harmonious society. ZCC is dedicated to the development of staff, enterprise and society.

Aimed at becoming an environmental-friendly enterprise, ZCC implemented clean production and promoted environmental protection by eliminating its energy-intensive production lines and introducing new technologies, new processes and new energy resources. In May 2011, the natural gas boiler system went into operation, and the last two chimneys were removed.

WORLDWIDE SALES NETWORK



ZCC adopts international business strategy. Sales branches in Germany, the US, etc. were successively set up. Products of ZCC are exported to more than 70 countries and regions around the world. Adhering to the brand position of "first in China, first-class in the world", ZCC has become a reliable business partner of world-renowned enterprises, such as Schlumberger and Kennametal, through business cooperation and technology development. ZCC constantly strengthens itself by shaping brand, and fully integrates international resources including brand, technology, channels, and culture.

Looking ahead, ZCC is committed to the rejuvenation of China's tungsten industry. Bearing in mind the spirit of "pursuing excellence with relentless efforts", ZCC will create a cemented carbide group that is "first in China, first-class in the world" by constantly improving its technological innovation capacity and playing a leading role in the industry.

U.S.A

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