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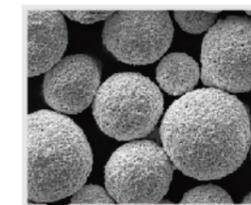
## ***HARD-FACING MATERIALS***

***LUOYANG GOLDEN  
EGRET GEOTOOLS CO.,LTD.***

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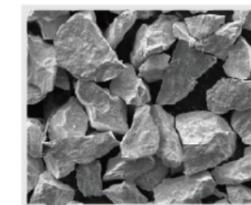
## KEY MANUFACTURING PROCESSES



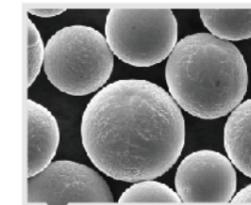
Agglomerated and Sintered



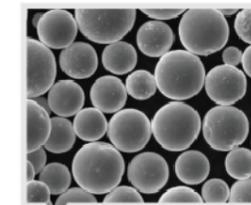
Sintered and Crushed



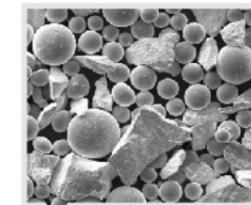
Fused and Crushed



Gas Atomized



Radio-frequency Plasma Spheroidization



Blended Hardfacing Material



Welding Wire



Tube Welding Rod



Welding Bar



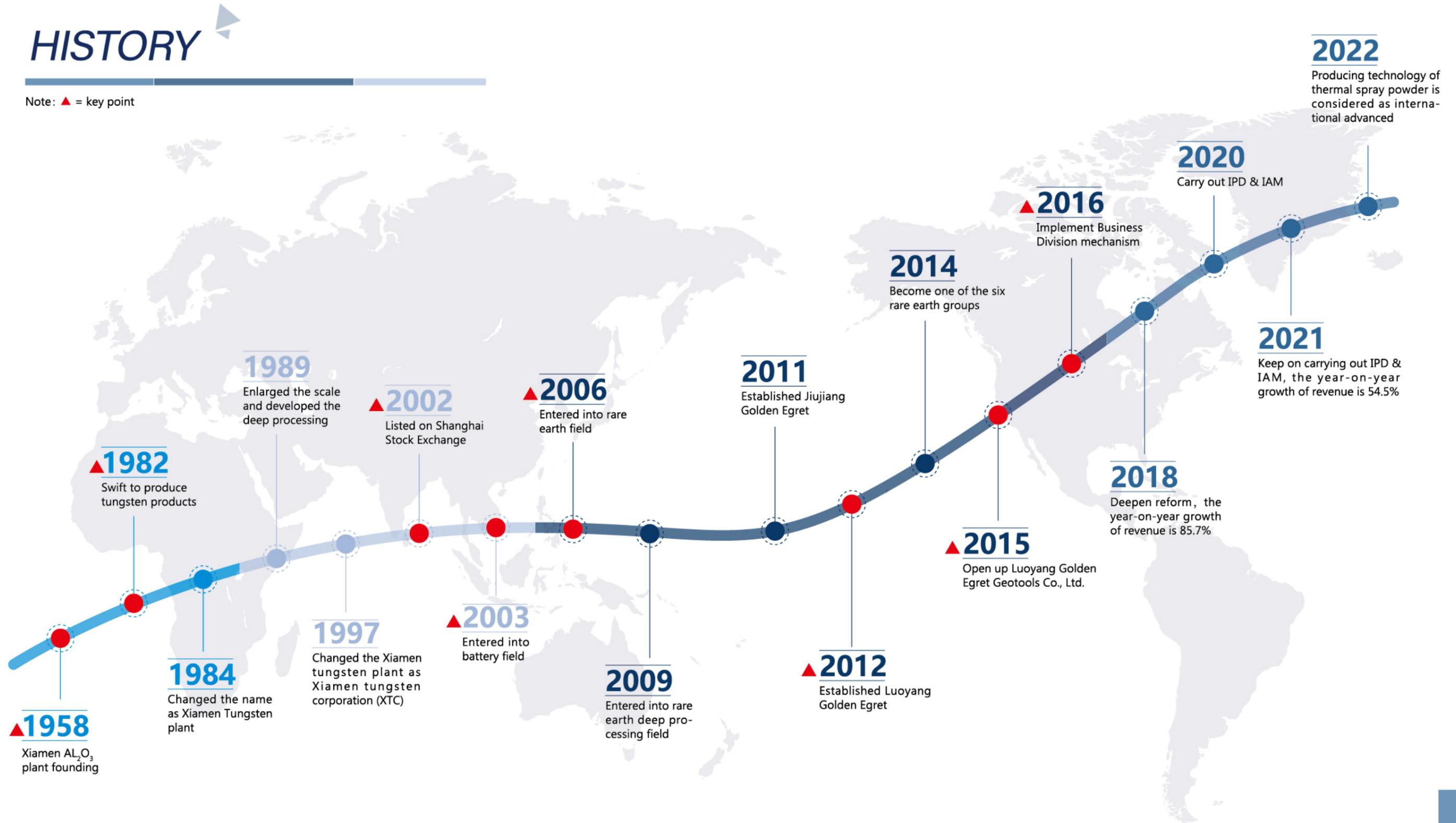
Compound Welding Bar



Flexible Welding Rope

# HISTORY

Note: ▲ = key point





## XTC GROUP

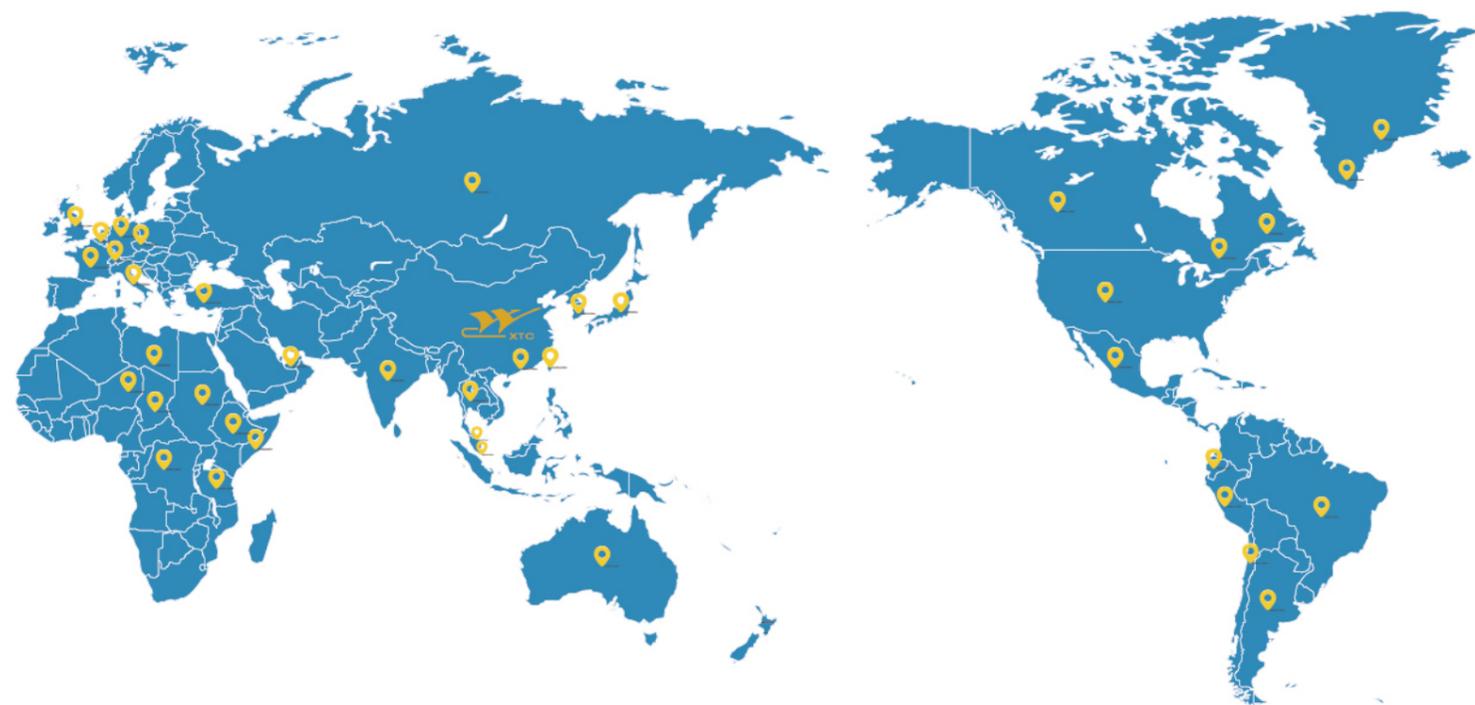
Xiamen Tungsten Co., Ltd. (XTC) is a public listed company on the Shanghai Stock Exchange. By the end of 2022, XTC owns 32 subsidiary companies, for R&D centers (China National R&D Center for Tungsten Technology, China National unites with local R&D center for advanced energy storage material, Rare Earth R&D center and New Energy Material R&D center), and three post-doctoral working stations. XTC is one of the national Key New & High-tech Enterprises, XTC is involved in the industrial chain of mining, tungsten, molybdenum, rare earth, and new energy etc.

## COMPANY PROFILE

Luoyang Golden Egret Geotools Co., Ltd. founded in 2012, is wholly-owned by the listed company Xiamen Tungsten Co., Ltd (XTC). As a backbone cemented carbide enterprise of XTC with registered capital of 30 million USD and first investment of 150 million USD, GEOTOOLS specializes in producing high quality tungsten powder, tungsten carbide powder, hard facing materials, carbide anvils, carbide roll rings and mining tools.

Relying on the China National R&D Center for Tungsten Technology and the platform of provincial R&D center of surface hard facing, Luoyang Golden Egret Geotools Co., Ltd has rich production experience of hard facing materials and devoted to the development and production of thermal spraying powder, self-fluxing alloy powders, welding materials, cast tungsten carbide. Luoyang makes great concentration to build up to be a world first-class hard facing materials manufacturer and service provider in better hardness, better wear resistance and better corrosion resistance materials field.

## SALES DISTRIBUTION NETWORK

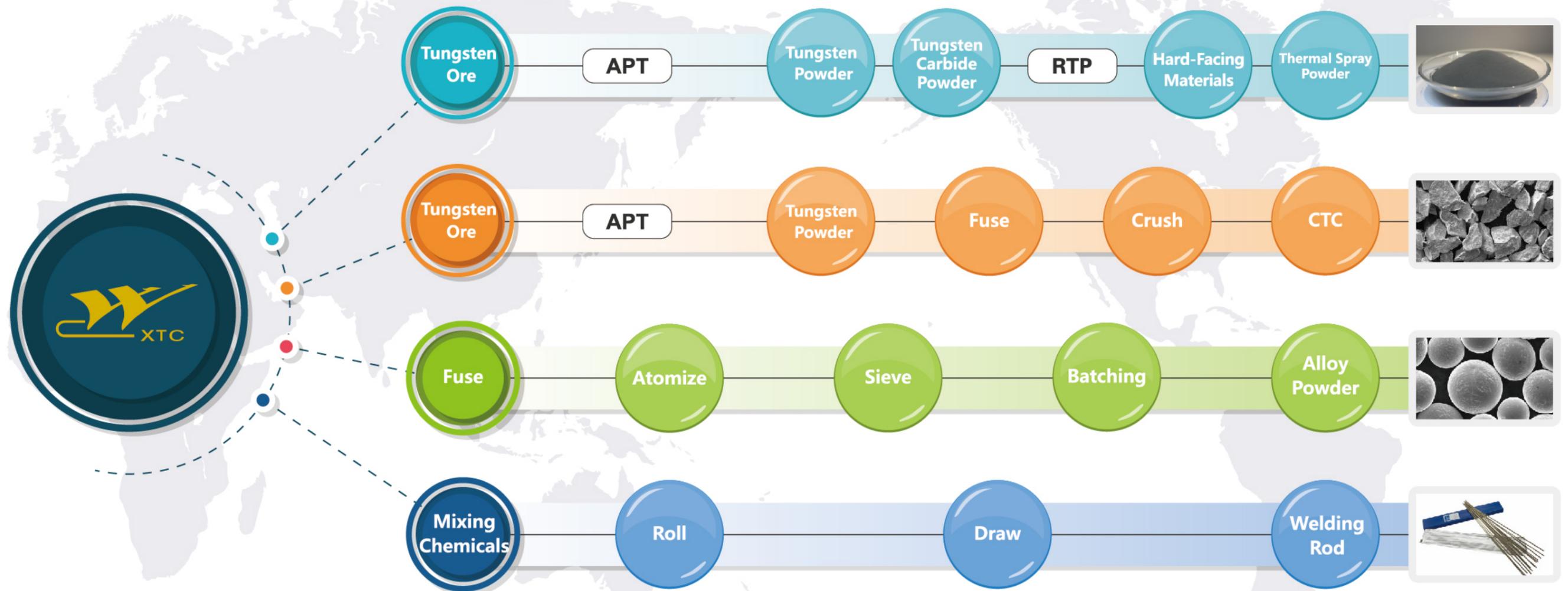


 Countries or origins products exported to

## INDUSTRIAL CHAIN

XTC has an integrated industrial chain from ore to deep processing on cemented carbide:

- ★ Raw materials quality control from the very beginning to ensure adequate raw materials and stable product quality;
- ★ XTC is the biggest tungsten production and supply base, and controls almost 30% high grade of tungsten resource in the world and annual 30,000 tons tungsten products are produced by XTC, which leads XTC to be the biggest base of tungsten products.



# PRODUCTS

## CARBIDE POWDER

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS			
GP10C-9	WC-10Co-4Cr	Agglomerated and Sintered	-90/+45µm	HVOF/HVAF 1. Medium WC 2. Max.operating temperature 500 °C 3. The coating applies to working of valve parts in high pressure and salty environment			
GP10C-3			-75/+45µm				
GP10C-4			-53/+20µm				
GP10C-1			-53/+15µm				
GP10C-18			-45/+20µm				
GP10C			-45/+15µm				
GP10C-10			-45/+11µm				
GP10C-2			-38/+15µm				
GP10C-7			-38/+10µm				
GP10C-20			-30/+10µm				
GP10C-19			-30/+5µm				
GP10C-16			-25/+5µm				
GP10C-22			-20/+5µm				
GP10C-42			-15/+5µm				
GP10C-31			-10/+2µm				
GP10CU-3			WC-10Co-4Cr		Agglomerated and Sintered	-53/+15µm	HVOF/HVAF 1. Fine WC 2. Max.operating temperature 500 °C 3. Intensive coating has compact microscopic structure and high bonding strength 4. Apply to papermaking roller, gate valve, ball valve, etc.
GP10CU-18						-45/+20µm	
GP10CU						-45/+15µm	
GP10CU-2	-38/+15µm						
GP10CU-7	-38/+10µm						
GP10CU-20	-30/+10µm						
GP10CU-19	-30/+5µm						
GP10CU-16	-25/+5µm						
GP10CU-22	-20/+5µm						
GP10CU-42	-15/+5µm						
GP10CU-31	-10/+2µm						
HP10CH	WC-10Co-4Cr	Agglomerated and Sintered	-45/+15µm	HVOF/HVAF 1. Nano WC 2. Max.operating temperature 500 °C 3. Very smooth coating with fine micro-structure and high bond strengths 4. Apply to papermaking roller, fan and compressor blades, gate valve, ball valve, etc.			
HP10CH-2			-38/+15µm				
HP10CH-20			-30/+10µm				
HP10CH-19			-30/+5µm				
HP10CH-16			-25/+5µm				
HP10CH-22			-20/+5µm				
HP10CH-42			-15/+5µm				
HP10CH-31			-10/+2µm				

## CARBIDE POWDER

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS			
GP10CA	WC-10Co-4Cr	Sintered & Crushed	-45/+15µm	HVOF/HVAF/APS 1. Medium WC 2. Max.operating temperature 500 °C 3. Useable in water based solutions and wet corrosive environments			
GP10CA-2			-38/+15µm				
GP10B	WC-WB-Co	Agglomerated and Sintered	-45/+15µm	HVOF/HVAF 1. Medium WC 2. Better wear resistance and corrosion resistance in molten metal 3. Apply to Continuous Galvanizing Lines (CGL)			
GP10B-19			-30/+5µm				
GP10BN	WC-WB-CoNiCr	Agglomerated and Sintered	-45/+15µm				
GP10BN-19			-30/+5µm				
GS06-2	WC-6Co	Agglomerated and Sintered	-180+75 µm	HVOF/APS 1. Medium WC 2. Max. operating temperature 500 °C 3. Dense, hard coating and good wear, erosion resistance 4. Fine microscopic structure and higher bonding strength			
GS06-3			-180+63 µm				
GS06			-180+45 µm				
GS06-10			-125+90 µm				
GS06-40			-125+75 µm				
GS06-12			-106+45 µm				
GS06-1			-53+20 µm				
GS06-18			-45+20 µm				
GP12-14			WC-12Co		Agglomerated and Sintered	-150/+106µm	HVOF/APS 1. Medium WC 2. Max. operating temperature 500 °C 3. Dense, hard coating and good wear, erosion resistance 4. Fine microscopic structure and higher bonding strength
GP12-23						-150/+53µm	
GP12-10	-125/+90µm						
GP12-8	-125/+45µm						
GP12-48	-125/+32µm						
GP12-41	-106/+75µm						
GP12-6	-106/+53µm						
GP12-12	-106/+45µm						
GP12-11	-106/+38µm	HVOF/APS/HVAF 1. Medium WC 2. Max. operating temperature 500 °C 3. Coating has the durable wear resistance, erosion resistance and sliding wear resistance 4. Intensive coating has compact micro structure and high bonding strength 5. Durable oxidation resistance and corrosion resistance 6. Apply to general wear-out parts, like corrugator roll of paper manufacturing machinery					
GP12-40	-106/+20µm						
GP12-9	-90/+45µm						
GP12-13	-75/+45µm						
GP12-3	-53/+20µm						
GP12-1	-53/+15µm						
GP12-18	-45/+20µm						
GP12	-45/+15µm						
GP12-26	-45/+11µm						
GP12-2	-38/+15µm						
GP12-33	-38/+10µm						
GP12-20	-30/+10µm						
GP12-19	-30/+5µm						
GP12-16	-25/+5µm						
GP12-22	-20/+5µm						
GP12-42	-15/+5µm						
GP12-31	-10/+2µm						

**CARBIDE POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GP12L-12	WC-12Co	Agglomerated and Sintered	-106/+45µm	HVOF/APS/HVAF 1. Medium WC 2. Max. operating temperature 500 °C 3. Coating has the durable wear resistance, erosion resistance and sliding wear resistance 4. Intensive coating and has compact micro structure and high bonding strength 5. Durable oxidation resistance and corrosion resistance 6. Apply to general wear-out parts, like corrugator roll of paper manufacturing machinery
GP12L-3			-53/+20µm	
GP12L-18			-45/+20µm	
GP12L			-45/+15µm	
GP12L-2			-38/+15µm	
GP12LD-3			WC-12Co	
GP12LD-1	-53/+15µm			
GP12LD	-45/+15µm			
GP12LD-2	-38/+15µm			
GP12LD-19	-30/+5µm			
GP12LD2	WC-12Co	Agglomerated and Sintered	-45/+15µm	HVOF 1. Coarse WC 2. Carbon content: 3.6%-4.1% 3. Apply to continuous hot galvanized production line (CGL)
GP12LD2-16			-25/+5µm	
GP12U-4	WC-12Co	Agglomerated and Sintered	-63/+20µm	HVOF/HVAF 1. Fine WC 2. Max. operating temperature 500 °C 3. Intensive coating has excellent oxidation resistance and corrosion resistance 4. Fine microscopic structure and higher bonding strength
GP12U-3			-53/+20µm	
GP12U			-45/+15µm	
GP12U-2			-38/+15µm	
GP12U-7			-38/+10µm	
GP12U-20			-30/+10µm	
GP12U-19			-30/+5µm	
GP12U-16			-25/+5µm	
GP12U-22			-20/+5µm	
GP12U-42			-15/+5µm	
GP12U-31			-10/+2µm	
GP12A-4			WC-12Co	
GP12A-8	-125/+45µm			
GP12A-12	-106/+45µm			
GP12A-9	-90/+45µm			
GP12A-3	-53/+20µm			
GP12A-1	-53/+15µm			
GP12A	-45/+15µm			
GP12A-2	-38/+15µm			

**CARBIDE POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GS13A-2	WC-13Co	Sintered & Crushed	-150/+53µm	HVOF 1. Coarse WC 2. Carbon content: 4.0%-4.5% 3. Apply to extruder barrel of the injection molding machine
GS13A			-150/+45µm	
GP17-9	WC-17Co	Agglomerated and Sintered	-90/+45µm	HVOF, HVAF 1. Medium WC 2. Max. operating temperature 500 °C 3. Coating has excellent wear resistance, erosion resistance and sliding wear resistance intensive coating has compact microscopic structure and high bonding strength 4. Excellent toughness of coating
GP17-13			-75/+45µm	
GP17-17			-63/+38µm	
GP17-1			-53/+15µm	
GP17			-45/+15µm	
GP17-2			-38/+15µm	
GP17-19			-30/+5µm	
GP17-16			-25/+5µm	
GP17-22			-20/+5µm	
GP17-31			-10/+2µm	
GP17U	WC-17Co	Agglomerated and Sintered	-45/+15µm	HVOF, HVAF 1. Fine WC 2. Max. operating temperature 500 °C 3. Intensive coating has excellent oxidation resistance and corrosion resistance 4. Fine microscopic structure and higher bonding strength
GP17U-2			-38/+15µm	
GP17U-19			-30/+5µm	
GP17U-16			-25/+5µm	
GP17U-31			-10/+2µm	
GP10N-3			WC-10Ni	
GP10N	-45/+15µm			
GP10N-2	-38/+15µm			
GP10N-7	-38/+10µm			
GP10N-19	-30/+5µm			
GP10N-16	-25/+5µm			
GP12N-9	WC-12Ni	Agglomerated and Sintered	-90/+45µm	HVOF 1. Medium WC 2. Max. operating temperature 500 °C 3. Good corrosion resistance and toughness
GP12N			-45/+15µm	
GP12N-2			-38/+15µm	
GP12N-7			-38/+10µm	
GP12N-19			-30/+5µm	
GP12N-16			-25/+5µm	
GP12NA	WC-12Ni	Sintered & Crushed	-150/+45µm	HVOF(Gas Fuel) 1. Medium WC 2. Max. operating temperature 500 °C 3. High Density, good corrosion resistance and toughness
GP12NA-33			-45/+15µm	
GP12NA-2			-38/+15µm	
GP15N	WC-15Ni	Agglomerated and Sintered	-45/+15µm	HVOF 1. Medium WC 2. Max. operating temperature 500 °C 3. Better erosion resistance and toughness than WC-Co coating
GP15N-2			-38/+15µm	

**CARBIDE POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GP17N-9	WC-17Ni	Agglomerated and Sintered	-90/+45µm	HVOF 1. Medium WC 2. Max.operating temperature 500 °C 3. Better erosion resistance and toughness than WC-Co coating
GP17N-1			-53/+20µm	
GP17N			-45/+15µm	
GP17N-2			-38/+15µm	
GP17N-7			-38/+10µm	
GP07N-9	WC-20Cr <sub>3</sub> C <sub>2</sub> -7Ni	Agglomerated and Sintered	-90/+45µm	HVOF/HVAF 1. Medium WC 2. Max. operating temperature 750 °C 3. Better corrosion resistance and toughness than WC-Co coating 4. Superior oxidation resistance and corrosion resistance than WC-Co coating 5. Apply to gate valve and relevant component
GP07N-3			-53/+20µm	
GP07N			-45/+15µm	
GP07N-2			-38/+15µm	
GP07N-7			-38/+10µm	
GP07N-19			-30/+5µm	
GP07N-16			-25+5µm	
GP06N-3	WC-21Cr <sub>3</sub> C <sub>2</sub> -6Ni	Agglomerated and Sintered	-53/+20µm	HVOF 1. Medium WC 2. Max. operating temperature 750 °C 3. Better corrosion resistance and toughness than WC-Co coating
GP06N			-45/+15µm	
GP16NR	WC-19Cr <sub>3</sub> C <sub>2</sub> -16Ni	Agglomerated and Sintered	-45/+15µm	HVOF/HVAF 1. Medium WC 2. Max. operating temperature 750 °C 3. Better corrosion resistance and toughness than WC-Co coating 4. Superior oxidation resistance and corrosion resistance than WC-Co coating 5. Apply to gate valve and relevant component 6. Similar to GP07N
GP16NR-19			-30/+5µm	
GP16NR-16			-25/+5µm	
GP11NM	WC-20Cr <sub>3</sub> C <sub>2</sub> -8.5Ni-2.5Mo	Agglomerated and Sintered	-45/+15µm	HVOF/HVAF 1. Medium WC 2. Max. operating temperature 750 °C 3. Better corrosion resistance and toughness than WC-Co coating 4. Superior oxidation resistance and corrosion resistance than WC-Co coating 5. Apply to gate valve and relevant component
GP11NM-2			-38/+15µm	
GP11NM-20			-30/+10µm	
GP18NM	WC-18(NiMoCrFeCo)	Agglomerated and Sintered	-45/+15µm	HVOF/HVAF 1. Medium WC 2. Max. operating temperature 500 °C 3. The powder with a highly corrosion resistant matrix which is similar to Hastelloy C 4. Better corrosion resistance than WC-Co-Cr and WC-Ni coatings
GP18NM-2			-38/+15µm	
GP09CN-3	WC-9Co-5Cr-1Ni	Agglomerated and Sintered	-53/+20µm	HVOF 1. Medium WC 2. Better corrosion resistance than WC-10Co-4Cr 3. Apply to components of pump body
GP09CN-1			-45/+15µm	
GP09CN-2			-38/+15µm	
GP09CN-7			-38/+10µm	

**CARBIDE POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GP10N5C-3	WC-10Ni-5Cr	Agglomerated and Sintered	-53/+20µm	HVOF 1. Medium WC 2. Max. operating temperature 500 °C 3. The coating applies to working of valve parts in high pressure and salty environment 4. Similar to GP10C
GP10N5C			-45/+15µm	
GP10N5C-7			-38/+10µm	
GP10N5C-19			-30/+5µm	
GP30N6C-9	WC-30Ni-6Cr	Agglomerated and Sintered	-90/+45µm	HVOF 1. Medium WC 2. Max.operating temperature 500 °C 3. Good corrosion resistance and toughness
GP30N6C			-45/+15µm	
GP10NC	Cr <sub>3</sub> C <sub>2</sub> -10NiCr	Agglomerated and Sintered	-45/+15µm	HVOF 1. Max.operating temperature 850°C 2. Compact corrosion resistance and erosion resistance coating 3. Excellent gas corrosion resistance 4. High temperature and gas corrosion resistance. 5. Apply to valve rod, oil drilling core pin, furnace bottom roller in steel industry
GP10NC-2			-38/+15µm	
GP20NC	Cr <sub>3</sub> C <sub>2</sub> -20NiCr	Agglomerated and Sintered	-45/+15µm	HVOF/HVAF 1. Max.operating temperature 850°C 2. Compact corrosion resistance and erosion resistance coating 3. Excellent gas corrosion resistance 4. High temperature and gas corrosion resistance. 5. Apply to valve rod, oil drilling core pin, furnace bottom roller in steel industry
GP20NC-2			-38/+15µm	
GP20NC-7			-38/+10µm	
GP25NC-9	Cr <sub>3</sub> C <sub>2</sub> -25NiCr	Agglomerated and Sintered	-90/+45µm	HVOF/HVAF 1. Max.operating temperature 850°C 2. Compact corrosion resistance and erosion resistance coating 3. Excellent gas corrosion resistance 4. High temperature and gas corrosion resistance. 5. Apply to valve rod, oil drilling core pin, furnace bottom roller in steel industry
GP25NC-3			-53/+20µm	
GP25NC-1			-53/+15µm	
GP25NC			-45/+15µm	
GP25NC-2			-38/+15µm	
GP25NC-7			-38/+10µm	
GP25NC-20			-30/+10µm	
GP25NC-19			-30/+5µm	
GP25NC-16			-25/+5µm	
GP25NC-22			-20/+5µm	

**CARBIDE POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GP25CY-3	Cr <sub>3</sub> C <sub>2</sub> --25(CoNiCrAlY)	Agglomerated and Sintered	-53/+20μm	HVOF/HVAF 1. Max.operating temperature 1000°C 2. Compact corrosion resistance and erosion resistance coating 3. Excellent gas corrosion resistance 4. High temperature and gas corrosion resistance. 5. Apply to valve rod, oil drilling core pin, furnace bottom roller in steel industry
GP25CY			-45/+15μm	
GP25CY-2			-38/+15μm	
GP25CY-7			-38/+10μm	
GP18NR	Cr <sub>3</sub> C <sub>2</sub> -37WC-18(NiCrCo)	Agglomerated and Sintered	-45/+15μm	HVOF/HVAF 1. Compact corrosion resistance and erosion resistance coating 2. Higher hardness than GP25NC 3. Hard-Chromium replacement
GP18NR-2			-38/+15μm	
GP18NR-7			-38/+10μm	
GP18NR-20			-30/+10μm	
GP18NR-19			-30/+5μm	
GP18NR-16	-25/+5μm			
GP37NT	Cr <sub>3</sub> C <sub>2</sub> -7WC-30(NiCr)	Agglomerated and Sintered	-45/+15μm	HVOF/HVAF 1. Compact corrosion resistance and erosion resistance coating 2. Higher hardness than GP25NC 3. Hard-Chromium replacement
GP37NT-2			-38/+15μm	
GP37NT-19			-30/+5μm	
GP58NRU	WC-42CrC-16Ni	Agglomerated and Sintered	-45/+15μm	HVOF/HVAF 1. Max. operating temperature 750 °C 2. Economical alternative to WC-Co-Cr for selected applications 3. Hard-Chromium replacement
GP58NRU-20			-30/+10μm	
GP58NRU-19			-30/+5μm	

**ALLOY POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPNi80Cr20-21	Ni-20Cr	Gas Atomized	-106/+45μm	APS, HVOF 1. Good bond coat for ceramic top coats 2. Excellent oxidation and corrosion resistant 3. Max. operating temperature 980°C
GPNi80Cr20-14			-90/+45μm	
GPNi80Cr20-6			-53/+20μm	
GPNi80Cr20-4			-45/+15μm	
GPNi80Cr20-50			-25/+5μm	
GPH625-21	Ni-20Cr-9Mo-3.5Nb	Gas Atomized	-106/+45μm	APS, HVOF, Laser cladding, PTA 1. Excellent oxidation and corrosion resistant 2. Used in boilers and chemical industry 3. Max. operating temperature 1000°C
GPH625-14			-90/+45μm	
GPH625-6			-53/+20μm	
GPH625-4			-45/+15μm	
GPH718-21	Ni-19Cr-18Fe-3Mo-5Nb-0.5Al-1Ti	Gas Atomized	-106/+45μm	APS, HVOF, Laser cladding, PTA 1. Excellent high temperature oxidation and corrosion resistance 2. Used in turbines and chemical equipment 3. Max. operating temperature 700°C
GPH718-14			-90/+45μm	
GPH718-6			-53/+20μm	
GPH718-4			-45/+15μm	
GPNiC276	Ni-16Cr-16Mo-4W	Gas Atomized	-45/+15μm	HVOF 1. ≤100HRB 2. High temperature corrosion and oxidation resistance; resists crevice corrosion, pitting, sulfuric acid and chlorine 3. Max. operating temperature 980°C
GPNi15AACu-23	Ni-20Cu-2Si-1B	Gas Atomized	-150/+53μm	PTA, HVOF, Laser cladding 1. HRC 15 2. Bonding layer for WC coatings 3. Max. operating temperature 700°C
GPNi23L-23	Ni-2.2Si-1.4B	Gas Atomized	-150/+53μm	PTA, Laser cladding 1. HRC 23 2. Glass molds for preliminary molding, various forming dies 3. Max. operating temperature 700°C
GPNi23L-26			-125/+53μm	
GPNi23L-21			-106/+45μm	
GPNi21APTA-23	Ni-6Cr-4Si-1B	Gas Atomized	-150/+53μm	PTA, HVOF, Laser cladding 1. HRC 30 2. Glass molds for preliminary molding, various forming dies 3. Max. operating temperature 700°C
GPNi40AA-27	Ni-7.5Cr-1.7B-3.5Si	Gas Atomized	-125/+45μm	PTA, HVOF, Laser cladding 1. HRC 40 2. Moderate wear resistance and very good machinability 3. Pistons, valves, pump blades, extrusion screws application 4. Max. operating temperature 650°C
GPNi40AA-6			-53/+20μm	
GPNi40AA-4			-45/+15μm	

**ALLOY POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPNi0600 001	Ni-3B-3Si	Gas Atomized	-106/+45µm	PTA 1. HRC 50 2. Chromium free; can be blended with carbide materials for higher wear resistance; suitable for thermal spray, spray and fuse welding and PTA 3. Max. operating temperature 650°C
GPNi0600 002			150/+45µm	
GPNi50AA-21	Ni-11Cr-2.2B-3.8Si-3Fe	Gas Atomized	-106/+45µm	PTA, HVOF, Flame spray welding 1. HRC 50 2. High hardness and wear resistance 3. Used in molds, Bearings and pistons 4. Max. operating temperature 650°C
GPNi50AA-6			-53/+20µm	
GPNi50AA-4			-45/+15µm	
GPNi60B-21	Ni-13.5Cr-2.5B-3Si-3Fe	Gas Atomized	-106/+45µm	PTA, HVOF, Flame spray welding, Laser cladding 1. HRC 56 2. High hardness and wear resistance 3. For industrial applications such as hot crushing rolls, forging tools, extrusion dies, screw conveyors, chip breakers and shafts, etc. 4. Max. operating temperature 650°C
GPNi60B-6			-53/+20µm	
GPNi60B-4			-45/+15µm	
GPNi60-21	Ni-17.5Cr-3.5B-4.5Si-13Fe	Gas Atomized	-106/+45µm	PTA, Flame spray welding 1. HRC60 2. High hardness and wear resistance 3. Pistons, valves, pump blades and extrusion screws application 4. Max. operating temperature 650°C
GPNi60-6			-53/+20µm	
GPNi60-4			-45/+15µm	
GPNi60AA-21	Ni-17.5Cr-3.5B-4.5Si-3Fe	Gas Atomized	-106/+45µm	PTA, HVOF, Laser cladding 1. HRC 60 2. High hardness and wear resistance 3. Pistons, valves, pump blades and extrusion screws application 4. Max. operating temperature 650°C
GPNi60AA-6			-53/+20µm	
GPNi60AA-4			-45/+15µm	
GPNi60AACuMo-23	Ni-16Cr-3B-4Si-3Cu-3Mo	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. HRC 58 2. Superior resistance to acids and aqueous media 3. For industrial applications such as hot crushing rolls, forging tools, extrusion dies, screw conveyors, chip breakers and shafts, etc. 4. Max. operating temperature 650°C
GPNi60AACuMo-21			-106/+45µm	
GPNi60AACuMo-6			-53/+20µm	
GPNi60AACuMo-4			-45/+15µm	

**ALLOY POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPS309L-23	Fe-23Cr-12Ni-1Mn-0.5Si	Gas Atomized	-150/+53µm	PTA, Laser cladding 1. ≤90HRB 2. Austenitic type stainless steel 3. For protection against corrosion, cavitation, low temperature particle erosion, salvage and repair 4. Max. operating temperature 540 °C
GPS309L-27			-125/+45µm	
GPS316L-23	Fe-17Cr-12Ni-2.5Mo	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. ≤90HRB 2. Austenitic type stainless steel 3. For protection against corrosion, cavitation, low temperature particle erosion, salvage and repair 4. Max. operating temperature 540 °C
GPS316L-14			-90/+45µm	
GPS316L-6			-53/+20µm	
GPS316L-4			-45/+15µm	
GPS410L-23	Fe-12.5Cr	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. ≤183HRB 2. Martensitic type stainless steel 3. For protection against corrosion, cavitation, low temperature particle erosion, salvage and repair 4. Max. operating temperature °C
GPS410L-27			-125/+45µm	
GPS410L-4			-45/+15µm	
GPS420-23	Fe-13Cr	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. ≤223HRB 2. Martensitic type stainless steel 3. For protection against corrosion, cavitation, low temperature particle erosion, salvage and repair 4. Max. operating temperature 420 °C
GPS420-21			-106/+45µm	
GPS420-6			-53/+20µm	
GPS420-4			-45/+15µm	
GPFe1000	Fe-15Cr-6.5Ni-3B-3Si	Gas Atomized	-45/+20µm	HVOF 1. HV 650 2. For hard surfaces in corrosive wear applications and oil industry 3. Max. operating temperature 550 °C
GPFe1100	Ni-11Cr-2.2B-3.8Si-3Fe	Gas Atomized	-53/+20µm	PTA, HVOF, Laser cladding 1. HRC 35 2. Engine Valve 3. Max. operating temperature 650 °C
GPFe1100			-150/+53µm	
GPFe1400	Fe-22Cr-5.5Ni-3Mo-1Si-1Mn	Gas Atomized	-125/+45µm	PTA, Laser cladding 1. HRC 20 2. Austenitic type and Ferrite type stainless steel. Used in petroleum, chemical, marine and natural gas industry 3. Max. operating temperature 550 °C
GPFe1400			-53/+20µm	
GPFe55-23	Fe-18Cr-3Ni-1B-1Si	Gas Atomized	-150/+53µm	Laser cladding 1. HRC 55 2. Enhanced wear and corrosion resistance 3. For hydraulic struts 4. Max. operating temperature 550 °C

**ALLOY POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPF0600	Fe-30Cr-5Ni-3Mo-3Si-2B-3.5C	Gas Atomized	-180/+75µm	PTA, Laser cladding 1. HRC 62 2. For hard surfaces in corrosive wear applications 3. For plastic industry extrusion screws, hydraulic piston rods and pump shafts, glass manufacturing molds and baffles, valve facing 4. Max. operating temperature 600 °C
GPCo06-23	Co-29Cr-4.5W-2Ni-1Si-1C	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. HRC 38 2. Engine valves, high temperature pressure valves, turbo engine blades 3. Max. operating temperature 840 °C
GPCo06-21			-106/+45µm	
GPCo06-6			-53/+20µm	
GPCo06-4			-45/+15µm	
GPCo06HC-23	Co-29Cr-4.5W-2Ni-1Si-1.5C	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. HRC 40 2. Engine valves, high temperature pressure valves, turbo engine blades 3. Max. operating temperature 840 °C
GPCo06HC-21			-106/+45µm	
GPCo06HC-6			-53/+20µm	
GPCo06HC-4			-45/+15µm	
GPCo12-23	Co-30Cr-8.5W-2.5Ni-1.5Si	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. HRC 42 2. High temperature pressure valves, saw teeth, extrusion screws 3. Max. operating temperature 840 °C
GPCo12-21			-106/+45µm	
GPCo12-6			-53/+20µm	
GPCo12-4			-45/+15µm	
GPCo21-23	Co-27.5Cr-5.1Mo-2.5Ni-1.5Si	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. HRC 28 2. High temperature pressure valves, saw teeth, extrusion screws 3. Max. operating temperature 840 °C
GPCo21-21			-106/+45µm	
GPCo21-6			-53/+20µm	
GPCo21-4			-45/+15µm	
GPCoSF20-23	Co-19Cr-13W-13Ni-2.4B-3.0Si-3.0Fe	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding, Flame spray welding 1. HRC 60 2. Self-fluxing; post-coat fuse for dense, virtually porosity free, metallurgically bonded coatings 3. High temperature pressure valves and seats 4. Max. operating temperature 840 °C
GPCoSF20-21			-106/+45µm	
GPCoSF20-6			-53/+20µm	
GPCoSF20-4			-45/+15µm	

**ALLOY POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPT800-23	Co-18Cr-28Mo-3.5Si-1.5Ni	Gas Atomized	-150/+53µm	PTA, HVOF, Laser cladding 1. HRC 53 2. Excellent high temperature sliding wear and self-lubricating 3. Resists corrosive environments such as HCl, H <sub>2</sub> SO <sub>4</sub> and salt water 4. Max. operating temperature 840 °C
GPT800-21			-106/+45µm	
GPT800-6			-53/+20µm	
GPT800-4			-45/+15µm	

**PURE METALS**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPMo025-9	Molybdenum	Agglomerated and Sintered	-90/+45µm	APS 1. Tough coating has excellent hardness, sliding performance and durable bonding strength apply to auto industry
GPMo025-13			-75/+45µm	
GPMo025-1			-53/+15µm	
GPMo025			-45/+15µm	
GPMo025-7			-38/+10µm	
GPW032-9	Tungsten	Agglomerated and Sintered	-90/+45µm	VPS 1. Acid-corrosion resistance 2. Durable high temperature stability performance in the non-oxidation environment, high-melting point
GPW032-2			-75/+45µm	
GPW032-3			-53/+20µm	
GPW032			-45/+15µm	
GPW032-4			-38/+15µm	

**ADDITIVE MANUFACTURING METAL POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPWQ15-45	W	Induced plasma spherification	-45/+15um	3D Printing 1. Spherical, Low oxygen levels, narrow distribution size 2. Used in grating for medical equipment
GPWQ5-25			-25/+5µm	
GPMoQ15-45	Mo	Induced plasma spherification	-45/+15um	3D Printing 1. Spherical, Low oxygen levels, narrow distribution size 2. Used in contact material, high temperature resistant component
GPMoQ5-25			-25/+5µm	
GPTaQ15-45	Ta	Induced plasma spherification	-45/+15um	3D Printing 1. Spherical, Low oxygen levels, narrow distribution size 2. Used in orthopedic implant material
GPTaQ5-25			-25/+5µm	
GPNbQ15-45	Nb	Induced plasma spherification	-45/+15um	3D Printing 1. Spherical, Low oxygen levels, narrow distribution size 2. Used in thermal protective material
GPNbQ5-25			-25/+5µm	
GPS316L-5	316L	Gas Atomized	-53/+15um	3D Printing 1. Spherical, Low oxygen levels, narrow distribution size 2. Used in aerospace, mold, vehicle
GPH625-5	Inconel 625	Gas Atomized	-53/+15um	3D Printing 1. Spherical, Low oxygen levels, narrow distribution size 2. Used in vehicle, aerospace, chemical processing
GPH718-5	Inconel 718	Gas Atomized	-53/+15um	3D Printing 1. Spherical, Low oxygen levels, narrow distribution size 2. Used in aerospace, gas turbine blades

**CTC**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GZ20-30F	W 95.0-96.0 Ct 3.8-4.1 Fe ≤0.4 Cr ≤0.1	Fused and Crushed	20-30 Mesh	1. Dark gray irregular particles, dendritic eutectic structure. 2. The melting point is 2525°C. 3. The hardness is 2300-2500 HV0.1. 4. Used in diamond petroleum drill, PTA, spray welding and wear resistant welding material. 5. Apply to the strengthening and repair of wear-resistant surfaces for mining machinery, petroleum machinery, and agricultural machinery.
GZ30-40F			30-40 Mesh	
GZ60-80F			60-80 Mesh	
GZ80-200F			80-200 Mesh	
GZ80-230F			80-230 Mesh	
GZ100-230F			100-230 Mesh	
GZ100-270F			100-270 Mesh	
GZ100-325F			100-325 Mesh	
GZ140-200F			140-200 Mesh	
GZ140-270F			140-270 Mesh	
GZ140-325F			140-325 Mesh	
GZ200-400F			200-400 Mesh	
GZ270-600F			270-600 Mesh	
GZ-325F			≤325 Mesh	
GZ-600F	≤600 Mesh			

**SCTC**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GZ45-80Q	W 95.0-96.0 Ct 3.8-4.2 Fe ≤0.5 Cr ≤0.1	Spheroidized	45-80 Mesh	1. Dark gray spheroidal particles, dendritic eutectic structure. 2. The melting point is 2525°C. 3. The hardness is 2800-3100 HV0.1. 4. Good fluidity and wear resistance, stable chemical properties. 5. The application area is similar to CTC.
GZ80-140Q			80-140 Mesh	
GZ80-200Q			80-200 Mesh	
GZ100-140Q			100-140 Mesh	
GZ100-200Q			100-200 Mesh	
GZ100-230Q			100-230 Mesh	
GZ100-270Q			100-270 Mesh	
GZ100-325Q			100-325 Mesh	
GZ140-325Q			140-325 Mesh	

**MTC**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPWC80-230	W Bal Ct 6.0-6.2 Fe ≤0.4 Cr ≤0.1	Sintered and Crushed	80-230 Mesh	1. Light grey macrocrystalline tungsten carbide. 2. The melting point is 2700°C. 3. The hardness is 1700-1800 HV0.1. 5. The application area is similar to CTC.
GPWC100-325			100-325 Mesh	
GPWC200-325			200-325 Mesh	

**BLENDED POWDER**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPNi0103B-6	Ni60AA + 40% CTC	Blended	-106/45um	PTA, Laser cladding 1. Good wear resistance, corrosion resistance and impact resistance 2. Apply to oil drilling tools, coal mining, screw, etc
GPNi0103B-4	Ni60AA + 50% CTC		-106/45um	
GPNi0103B	Ni60AA + 60% CTC		-106/45um	
GPNi0603B-2	NiBSi + 62% CTC	Blended	-150/45um	PTA, Laser cladding 1. Excellent wear resistance, corrosion resistance and impact resistance 2. Apply to oil drilling tools, coal mining, screw, etc
GPNi0801B	Ni40AA + 60% SCTC		-180/63um	
GPNi2501B	Ni50AA + 60% SCTC		-106/45um	
GPNi0101B-1	Ni60AA + 40% SCTC		-150/45um	
GPNi0101B-2	Ni60AA + 50% SCTC		-150/45um	
GPNi0101B-4	Ni60AA + 60% SCTC		-150/45um	
GPNi0601B	NiBSi + 60% SCTC		-150/45um	
GPNi0104B	Ni60AA + 38% WC6Co	Blended	-106/+45um	PTA, Laser cladding 1. Good wear resistance, corrosion resistance and impact resistance 2. Apply to drawing tower wheel, mixed blade, farm machinery tool, etc
GPNi0105B	Ni60AA + 60% WC10Co4Cr		-180/+45um	
GPNi0104B-9	Ni60AA + 80% WC12Co		-125/+45um	
HPNi0904B-1	Ni60B + 40% WC12Co		-45/+15um	

**OXIDE CERAMICS**

GRADE	CHEMICAL COMPOSITION	POWDER TYPE	PARTICLE SIZE	PROPERTIES AND APPLICATIONS
GPFAI <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	Fused and Crushed	-45/+15μm	APS 1. Purity 99.8+ 2. Max. operating temperature 1650°C 3. Excellent dielectric and thermal insulation characteristics, resists wear, chemically inert, stable at high temperatures 4. For corona rolls, capacitors coating
GPFAT3-26	Al <sub>2</sub> O <sub>3</sub> -3TiO <sub>2</sub>	Fused and Crushed	-45/+11μm	APS 1. Max. operating temperature 1100°C 2. Excellent resists abrasion, friction, oxidation, acids, alkalis 3. For rolls in paper industry, textile production tooling
GPFAT3-24			-22/+5μm	
GPFAT13	Al <sub>2</sub> O <sub>3</sub> -13TiO <sub>2</sub>	Fused and Crushed	-45/+15μm	APS 1. Max. operating temperature 540°C 2. Excellent resists abrasion, oxidation, acids, alkalis 3. For mechanical seals, hydraulic parts, shaft sleeves
GPFAT13-24			-22/+5μm	
GPFAT40	Al <sub>2</sub> O <sub>3</sub> -40TiO <sub>2</sub>	Fused and Crushed	-45/+15μm	APS 1. Max. operating temperature 540°C 2. Excellent wear and erosion resistant, good grindability 3. For shaft sleeves, pump parts, mechanical seals
GPFAT40-29			-45/+5μm	
GPSCr <sub>2</sub> O <sub>3</sub> -13	Cr <sub>2</sub> O <sub>3</sub>	Sintered and Crushed	-75/+45μm	APS 1. Purity 99.5+ 2. Max. operating temperature 540°C 3. Hard, corrosion and wear resistant ceramic coatings 4. For anilox rolls in printing machines
GPSCr <sub>2</sub> O <sub>3</sub> -18			-45/+20μm	
GPSCr <sub>2</sub> O <sub>3</sub>			-45/+15μm	
GPSCT25	Cr <sub>2</sub> O <sub>3</sub> -25TiO <sub>2</sub>	Sintered and Crushed	-45/+15μm	APS 1. Max. operating temperature 540°C 2. Excellent abrasion, heat and corrosion resistance 3. For doctor blades, machine tool breakers
GPACSS3T-13	Cr <sub>2</sub> O <sub>3</sub> -5SiO <sub>2</sub> -3TiO <sub>2</sub>	Agglomerated and Sintered	-75/+45μm	APS 1. Max. operating temperature 540°C 2. Excellent corrosion resistance 3. For wear rings, down-hole plungers, pump components
GPACSS3T			-45/+15μm	
GPSTiO <sub>2</sub>	TiO <sub>2</sub>	Sintered and Crushed	-45/+15μm	APS 1. Max. operating temperature 540°C 2. Excellent corrosion resistance 3. For wear rings, down-hole plungers, pump components
GPSTiO <sub>2</sub> -20			-30/+10μm	

**TUNGSTEN CARBIDE-FILLED SURFACING MATERIAL**

GRADE	DIMENSIONS (MM)	PRIMARY FILLER	TYPICAL MESH SIZE	DEPOSIT CARBIDE FILL (%)	PREPARATION TECHNOLOGY	PROPERTIES AND APPLICATIONS	
GT1103	D3.2*700	CTC	60-80mesh	60±1%		Oxyacetylene welding Arc welding	
	D4.0*700						
	D6.0*700						
GT1103-1	D4.0*700	CTC	20-30mesh	61±1%		Surface strengthening of mining equipment, geological tools, oil drilling, road and highway construction equipment, feed crusher hammer and kinds of work-pieces	
	D5.0*700						
	D6.0*700						
GT1103-2	D4.0*700	CTC	30-40mesh	60±1%			
GT1103-3	D4.0*600	CTC	20-40mesh	61±1%			
GT1203	D4.0*700	CTC	30-40mesh	61±1%			
		GQ06	14-40mesh				
GT1403	D4.0*700	CTC	30-40mesh	67.5±1%			
		GQ06	16-30mesh				
		MTC	80-200mesh				
		SCTC	100-270mesh				
GT3202	D3.2*700	GQ06	30-40mesh	60±1%	Tubular, wire rolling forming	Oxyacetylene welding Arc welding	
		CTC	40-200mesh				
GT3202-1	D4.0*700	GQ06 SCTC	16-30mesh 80-140mesh	68±1%	Skin is low carbon steel, flux core is cast tungsten carbide/spherical cast tungsten carbide/cemented carbide pellets/-monocrystal tungsten carbide or its mixture	Surface strengthening of tricorne bits, steel tooth drill bits, PDC bits	
GT3302	D3.2*700	GQ06	30-40mesh	67±1%			
		SCTC	45-80mesh				
GT3302-1	D4.0*700	GQ06	14-40mesh	62±1%			
		SCTC CTC	40-200mesh 40-200mesh				
GT3302-2	D4.0*700	GQ06	14-40mesh	66±1%			
		SCTC GS08A	45-80mesh 40-80mesh				
GT4104	D3.2*700	MTC	80-200mesh	60±1%		Oxyacetylene welding Arc welding surface strengthening and repairing of oil drill bits and wear-resistant parts of hydro-powder industry	
							D4.0*700
							D5.0*700
							D6.0*700
GT4104-1	D4.0*700	MTC	40-100mesh	61±1%			
							D5.0*700
GT5205	D4.0*700	SCTC	100-270mesh	62±1%		Oxyacetylene welding Arc welding Surface strengthening of drill pipe and wear-resistant parts of petroleum industry	
		MTC	80-230mesh				
GT9909	D4.3*600	CTC	60-80mesh	64±1%		Oxyacetylene welding Arc welding Surface strengthening of feed crusher hammers	

**FLEXIBLE WELDING ROPE**

GRADE	DIMENSIONS (MM)	PRIMARY FILLER	TYPICAL MESH SIZE	DEPOSIT CARBIDE FILL (%)	PREPARATION TECHNOLOGY	PROPERTIES AND APPLICATIONS
GS110550N	D5.0	CTC	20-30mesh 80-230mesh	68%		Flexible wire, extruded coated forming
GS110650N	D6.0					
GS110850N	D8.0					
GS110450N-1	D4.0	CTC	20-30mesh	61±1%		Nickel-based wire extruded coated with cast carbide tungsten carbide / spherical cast tungsten carbide / cemented carbide pellets / cemented carbide particles/single crystal tungsten carbide or its mixture
GS110550N-1	D5.0					
GS110650N-1	D6.0					
GS110850N-1	D8.0					
GS120550N	D5.0	CTC	20-30mesh	65%		
GS120650N	D6.0	SCTC	45-80mesh			
GS510550N	D5.0	SCTC	45-80mesh	60%		
GS510650N	D6.0					
GS510450N-1	D4.0	SCTC	45-80mesh	65%		
GS510550N-1	D5.0					
GS510650N-1	D6.0					
GS530550N	D5.0	CTC	80-230mesh	60%		
		GQ06	14-40mesh			
GS530650N	D6.0	SCTC	45-80mesh			

**COMPOUND WELDING BAR**

GRADE	DIMENSIONS (MM)	PRIMARY FILLER	TYPICAL MESH SIZE	DEPOSIT CARBIDE FILL (%)	PREPARATION TECHNOLOGY	PROPERTIES AND APPLICATIONS
GDCU0170	W14-16*L450	GS08A	0.4-1.6 mm	70%	Bar, sintered forming	Oxyacetylene welding
GDCU0270	W14-16*L450	GS08A	1.6-3.2mm			
GDCU0370	W14-16*L450	GS08A	3.2-4.8mm			
GDCU0470	W14-16*L450	GS08A	4.8-6.4mm			
GDCU0570	W14-16*L450	GS08A	6.4-8.0mm			
GDCU0670	W14-16*L450	GS08A	8.0-10.0mm			
GDNI0170	W14-16*L450	GS08A	0.4-1.6mm	70%	Bar, sintered forming	welding on the serious damaged workpieces in petroleum, mining, coal mining, geology, construction industries. Such as: milling shoes, stablizers, reamers, drill pipe joints, hydraulic cutters, blades, planer knives, coring drills, pile drills, auger drills
GDNI0270	W14-16*L450	GS08A	1.6-3.2mm			
GDNI0370	W14-16*L450	GS08A	3.2-4.8mm			
GDNI0470	W14-16*L450	GS08A	4.8-6.4mm			
GDNI0570	W14-16*L450	GS08A	6.4-8.0mm			
GDNI0670	W14-16*L450	GS08A	8.0-10.0mm			

**WELDING BAR**

GRADE	DIMENSIONS (MM)	PRIMARY FILLER	TYPICAL MESH SIZE	DEPOSIT CARBIDE FILL (%)	PREPARATION TECHNOLOGY	PROPERTIES AND APPLICATIONS
GD4025253-3	3.2*3.2*460	SCTC CTC	100-325mesh 30-40mesh	50%	Bar, sintered forming	Oxyacetylene welding  Surface strengthening of oil drilling tools, PDC bits and other parts
GD4030303-3	3.2*3.2*460	SCTC CTC	100-325mesh 30-40mesh	60%	Nickel-based alloy sintered with cast carbide tungsten carbide/spherical cast tungsten carbide/cemented carbide pellets/cemented carbide particles/single crystal tungsten carbide or its mixture	
GD4030304-6	4.0*4.0*600	SCTC	45-80mesh	60%		
GD4030306-6	6.0*6.0*600		100-325mesh			
GD551515154-2	4.0*4.0*600	GQ06 CTC	16-40mesh	45%		
GD551515156-2	6.0*6.0*600		20-30mesh			
GD4045154-4						

**SOLID WIRES**

GRADE	CHEMICAL COMPOSITION	DIMENSIONS (MM)	HARDNESS (HRC)	PROPERTIES AND APPLICATIONS
GSHFeCrAl-4	Fe 23Cr 5Al	D1.6	≥40HRC	Arc spraying, corrosion resistant wire  welding layer has high temperature oxidation resistance, sulfate, sulfide and hydrogen sulfide high temperature corrosion resistance, Boiler tubes that burn high sulfur coal, steel converter smoke hoods, flues, dust collectors, shafts, pumps, rollers, dryers for anti-corrosion anti-wear.
GSCu99FO-4	Cu	D1.6	60HB	Argon arc welding, oxygen free copper solid wire  Applied to argon arc welding of red copper and welding of copper with thickness greater than 3mm and steel, gray cast iron and nickel alloy. It is especially suitable for large thickness welding parts
GSCu8Al-4	Cu 8Al	D1.6	100HB	Argon arc welding, aluminum bronze solid wire  Applied to ship and machinery manufacturing and other industries, suitable for carbon steel, stainless steel welding, steel and copper butt-joint.
GSCu10AlFe-9	Cu 10Al 1Fe	D3.2	140HB	Argon arc welding, aluminum bronze wire  welding layer has wear-resistance, sea-water corrosion resistance. Ship building, instrument, machine pump manufacturing
GSNi5Al	Ni 5Al	D1.6	31HRC	Arc spraying Bonding layer
GSNi20Al-9	Ni 20Al	D3.2	30HRC	Arc spraying Bonding layer

**FLUX-CORED WIRES FOR HARDFACING**

GRADE	CHEMICAL COMPOSITION	DIMENSIONS (MM)	HARDNESS (HRC)	PROPERTIES AND APPLICATIONS
GSQD531B-4	Fe 25Cr 4C 2Mn 1Si 0.3B	D1.6mm	50-56	Gas shielded welding Abrasive worn parts of construction machinery, such as vertical mills, crusher rolls, wear-resistant lining plates
GSQD621Mo-4	Fe 22Cr 4C 0.8Mn 0.8Si 0.7Mo 0.6B	D1.6mm	58-64	Gas shielded welding Seriously abrasive worn parts of construction machinery, such as vertical mills, crusher rolls, wear-resistant lining plates
GSQD622NiB-4	Fe 21Cr 4C 1Mn 1Si 1.6Mo 1.5B	D1.6mm	60-64	Gas shielded welding Seriously abrasive worn parts of construction machinery, such as vertical mills, crusher rolls, wear-resistant lining plates
GSQD671Mo-4	Fe 21Cr 4C 1Mn 1Si 1.6Mo 1.5B	D1.6	63-68	Gas shielded welding Strengthening workpieces that require high hardness and wear resistance. Shield cutters, wear-resistant lining plates
GSZD610-7	Fe4.5C1Si1.25Mn19Cr	D2.8	58-63	Open arc welding Strengthening workpieces that require seriously wear under slight impact. Wear-resistant lining plates, chutes, coal mine line pans, etc
GSZD610Mo-7	Fe4C1.5Si1.75Mn27 Cr0.7Mo0.35Ni	D2.8	59-64	Open arc welding Suitable for the workpiece intensely wear under slight impact. Wear-resistant lining plate, chute, coal mine middle throughs

**FLUX-CORED WIRES FOR ARC SPRAY**

GRADE	CHEMICAL COMPOSITION	DIMENSIONS (MM)	HARDNESS (HV0.3)	PROPERTIES AND APPLICATIONS
GSSFe502-4	Fe 28Cr 5C 1Mn	D1.6	450-600	Arc spraying Dry cyclinder in paper industry
GSSFe552B-4	Fe 30Cr 1C 4B 1.75Si 0.3Mn	D1.6	600-800	
GSSFe652B-4	Fe 28Cr 5C 5B 0.6Si 0.3Mn	D1.6	800-900	

## R&D CENTER

CHINA NATIONAL R&D CENTER FOR TUNGSTEN TECHNOLOGY is the only National Center for tungsten technology in China. There are large groups of highly educated technical staff members with advanced R&D experience using the state of the art metallurgical laboratory equipment.

GEOTOOLS is equipped with JP8000 HVOF, laser cladding, PTA and spray welding system and lab center to test and analyze performance of coatings to provide solutions to our customers and develop the new products for the market.



CHINA NATIONAL R&D CENTER FOR TUNGSTEN TECHNOLOGY

## QUALITY ASSURANCE

### LAB EQUIPMENT

PERFORMANCE	INSTRUMENT	MANUFACTURER/BRANDS
CHEMICAL ANALYSIS	INDUCTIVELY COUPLED PLASMA EMISSION SPECTROMETER (ICP-AES/OES)	THERMO FLY
	CARBON SULFUR ANALYZER	LECO
	ATOMIC ABSORPTION SPECTROPHOTOMETER	SHIMADZU
	CARANALYZER	SHANGHAI LEIYUN TEST INSTRUMENT MANUFACTURING CO. LTD
	OXYGEN AND NITROGEN ANALYZER	BEIJING CISRI-GAONA MATERIALS & TECHNOLOGY CO., LTD.
	ENERGY DISPERSIVE X-RAY SPECTROMETER (EDS)	OXFORD X-MAX
PHYSICAL ANALYSIS	TOP-KNOCKING VIBRATING SCREEN	SHANGYU EXTENSION INSTRUMENT EQUIPMENT CO., LTD
	FLUIDITY AND APPARENT DENSITY METER	BEIJING IRON AND STEEL RESEARCH INSTITUTE
	LASER PARTICLE SIZE ANALYSER	MALVERN
	SCANNING ELECTRON MICROSCOPE (SEM)	ZEISS
COATING ANALYSIS	METALLOGRAPHIC MICROSCOPE	ZEISS
	VICKERS	WILSON
	ROCKWELL HARDNESS TESTER	WILSON
	ELECTRONIC UNIVERSAL TESTING MACHINE	SHENZHEN SUNS TECHNOLOGY STOCK CO., LTD.
	PENDULUM IMPACT TESTING MACHINE	SHENZHEN SUNS TECHNOLOGY STOCK CO., LTD.
	ASTM B117 SALT SPRAYING TESTER	
	ASTM G65 ABRASIVE WEAR TESTER	
	ASTM B611 ABRASIVE WEAR TESTER	
	THERMAL SHOCK TESTER	MUFFLE
	COATING ROUGHMETER	

## QUALITY ASSURANCE



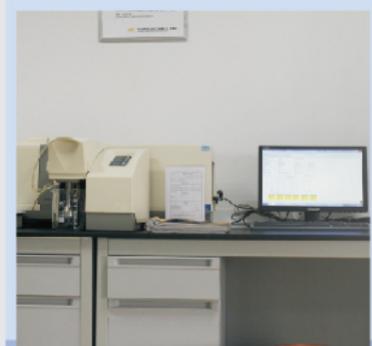
Inductively Coupled Plasma Optical Emission Spectrometer(ICP-OES)



Carbon-Sulfur Analyzer



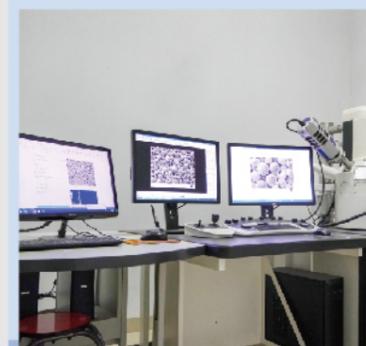
Oxygen Nitrogen Analyzer



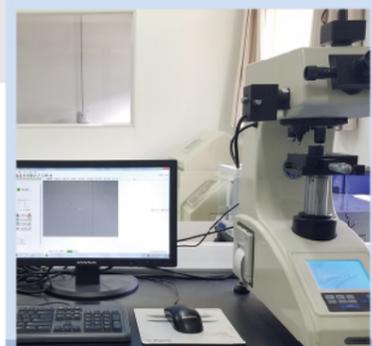
Laser Particle Size Distribution Analyzer



Metallographic Microscope



Scanning Electron Microscope



Hardness Meter

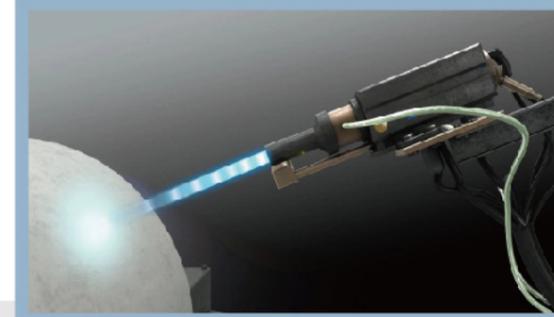


G65 Abrasive Wear Tester



Salt Spray Tester

## APPLICATION TEST SYSTEM



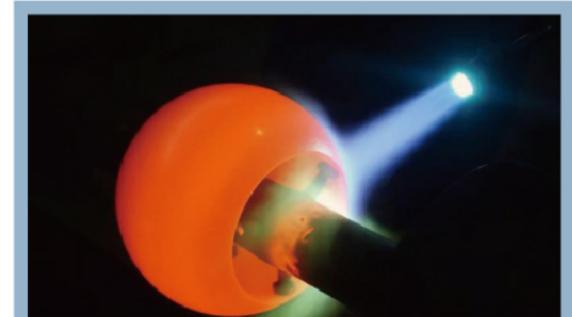
HVOF Spray System



Laser Cladding System



PTA Welding System



Arc Spray Welding System



Arc Spray System



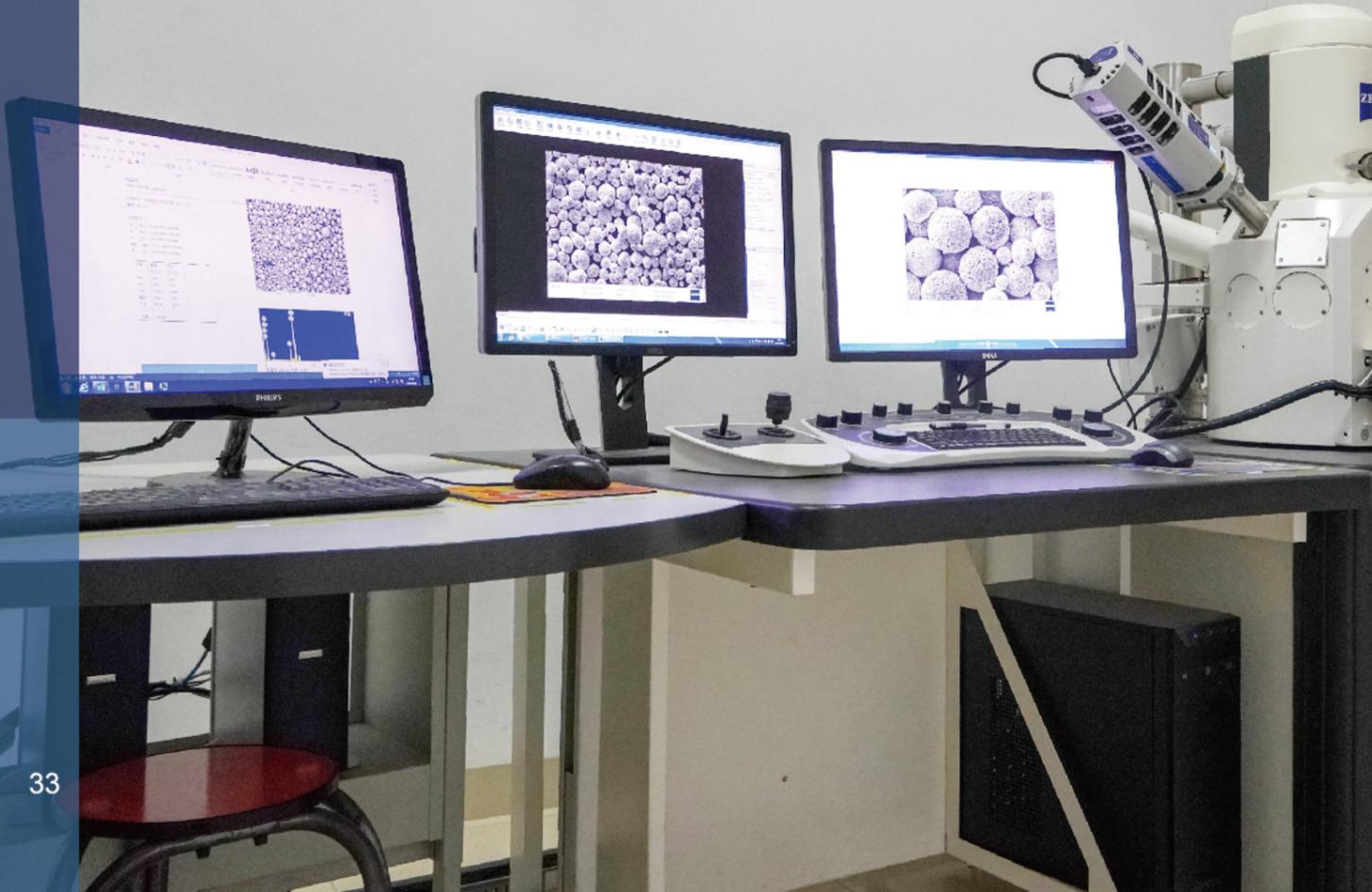
Oxy-Acetylene Flame Welding System



Carbon Dioxide Welding System

## QUALITY CONTROL

Quality is the life of product and foothold of the enterprise development. GEOTOOLS, as the successive & new beginning of GESAC which depending on years of powder and tungsten series producing experience and complete quality control system, also take excellent and steady product quality as assurance of development. GEOTOOLS Utilizes the state of art testing equipment and thorough process control system and final quality control system to ensure the quality of finished goods.





**PARTICLE SIZE CONVERSION CHART**

A.S.T.M. MESH	A.S.T.M OPENINGS (UM)	I.S.S. OPENINGS (UM)	TYLER MESH	TYLER OPENINGS (UM)	I.S.S. OPENINGS (UM)
625	20	-	625	20	-
500	25	-	500	25	-
400	38	-	400	37	-
325	45	-	325	44	-
270	53	50	270	52	50
230	63	63	250	61	-
200	75	75	200	74	75
170	90	90	170	88	90
140	106	-	150	104	100
120	125	125	115	124	125
100	150	150	100	147	150
80	180	180	80	175	180
70	212	200	65	208	200
60	250	250	60	246	250
50	300	300	48	295	300
45	355	365	42	351	365
40	425	400	35	417	400
35	500	500	32	500	500
30	600	600	28	589	600
25	710	710	24	701	710
20	850	800	20	833	800
18	1000	-	16	991	-
16	1180	-	14	1168	-
14	1400	-	12	1397	-
12	1700	-	10	1651	-
10	2000	-	9	2057	-
7	2812	-	7	2812	-
5	4000	-	5	4000	-

**MECHANICAL PROPERTY CONVERSION CHART**

TENSILE STRENGTH (RMN/MM2)	VICKERS HARDNESS (HV)	BRINELL HARDNESS (HB)	ROCKWELL HARDNESS (HRC)	TENSILE STRENGTH (RMN/MM2)	VICKERS HARDNESS (HV)	BRINELL HARDNESS (HB)	ROCKWELL HARDNESS (HRC)
250	80	76	—	1095	340	323	34.4
270	85	80.7	—	1125	350	333	35.5
285	90	85.2	—	1115	360	342	36.6
305	95	90.2	—	1190	370	352	37.7
320	100	95	—	1220	380	361	38.8
335	105	99.8	—	1255	390	371	39.8
350	110	105	—	1290	400	380	40.8
370	115	109	—	1320	410	390	41.8
380	120	114	—	1350	420	399	42.7
400	125	119	—	1385	430	409	43.6
415	130	124	—	1420	440	418	44.5
430	135	128	—	1455	450	428	45.3
450	140	133	—	1485	460	437	46.1
465	145	138	—	1520	470	447	46.9
480	150	143	—	1555	480	-456	47.7
490	155	147	—	1595	490	-466	48.4
510	160	152	—	1630	500	-475	49.1
530	165	156	—	1665	510	-485	49.8
545	170	162	—	1700	520	-494	50.5
560	175	166	—	1740	530	-504	51.1
575	180	171	—	1775	540	-513	51.7
595	185	176	—	1810	550	-523	52.3
610	190	181	—	1845	560	-532	53
625	195	185	—	1880	570	-542	53.6
640	200	190	—	1920	580	-551	54.1
660	205	195	—	1955	590	-561	54.7
675	210	199	—	1995	600	-570	55.2
690	215	204	—	2030	610	-580	55.7
705	220	209	—	2070	620	-589	56.3
720	225	214	—	2105	630	-599	56.8
740	230	219	—	2145	640	-608	57.3
755	235	223	—	2180	650	-618	57.8
770	240	228	20.3	—	660	—	58.3
785	245	233	21.3	—	670	—	58.8
800	250	238	22.2	—	680	—	59.2
820	255	242	23.1	—	690	—	59.7
835	260	247	24	—	700	—	60.1
850	265	252	24.8	—	720	—	61
865	270	257	25.6	—	740	—	61.8
880	275	261	26.4	—	760	—	62.5
900	280	266	27.1	—	780	—	63.3
915	285	271	27.8	—	800	—	64
930	290	276	28.5	—	820	—	64.7
950	295	280	29.2	—	840	—	65.3
965	300	285	29.8	—	860	—	65.9
995	310	295	31	—	880	—	66.4
1030	320	304	32.2	—	900	—	67
1060	330	314	33.3	—	920	—	67.5