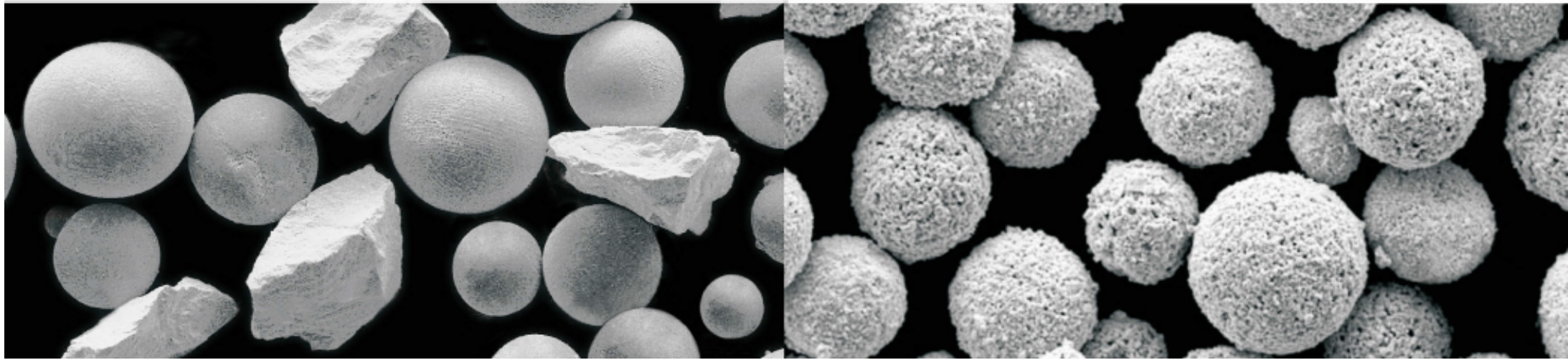


Thermal Spray Powder Plasma Transferred Arc(PTA) Powder



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WC-CO-Cr Series

Material Properties

Micro-hardness: 1000-1400 HV_{0.05}
 Apparent density: 4.5-5.6 g/cm³
 Hall Flow: 12-30 s/50g
 Particle size ranges: 850um-5um

Coating properties

Bond Strength: >70Mpa
 Porosity: <1%

Specification and Manufacture

Chemistry	Size	Products	Manufacture	WOKA	H.C. Starck
Tungsten Carbide - Cobalt - Chromium					
WC-10Co-4Cr	-75+45um	EC-P2112	Agglomerated & Sintered		
	-75+20um	EC-P2114			
	-63+20um	EC-P2101		WOKA 3651	558.088
	-45+15um	EC-P2102		WOKA 3652/ WOKA 3652 FC	558.074/ 557.074
	-38+10um	EC-P2104		WOKA 3655	557.072/ 558.072
	-25+5um	EC-P2109	WOKA 3660		

Notes: 1.Can be customized according to customer specific requirements(Coarse powder/fine powder/ultra-fine powder)
 2.Please dry the powder before using once it's affected with damp(120°C keep warm 1 hour)

Characteristic

- ◆Co-Cr matrix shows higher corrosion and abrasion resistance than Co matrix.
- ◆Usable in water based solutions and wet corrosive environments.
- ◆Smooth coatings with fine micro-structure and high bond strengths.
- ◆Hard chrome replacement.
- ◆Used for paper rolls, gate and ball valves, steel rolls, shafts, etc.

WC-Co Series

Material Properties

Micro-hardness: 900-1400 HV_{0.05}
 Apparent density: 4.3-5.5 g/cm³
 Hall Flow: 12-30 s/50g
 Particle size ranges: 850um-5um

Coating properties

Bond Strength: >79Mpa
 Porosity: <1%

Specification and Manufacture

Chemistry	Size	Products	Manufacture	WOKA	H.C. Starck
Tungsten Carbide - Cobalt					
WC-12Co	-75+45um	EC-P1312	Agglomerated & Sintered		
	-75+20um	EC-P1314			
	-53+20um	EC-P1301		WOKA 3101	519.088/ 518.088
	-45+15um	EC-P1302		WOKA3102	518.074/ 519.074
	-38+10um	EC-P1304		WOKA 3105	519.072
WC-17Co	-25+5um	EC-P1309		WOKA 3110	
	-75+45um	EC-P1412	Agglomerated & Sintered		
	-75+20um	EC-P1414			
	-53+20um	EC-P1401		WOKA 3201	
	-45+15um	EC-P1402		WOKA 3202	526.074
-38+10um	EC-P1404				
WC-12Co	-25+5um	EC-P1409			
	-90+45um	EC-P81318			515.002
	-45+20um	EC-P81310	Sintered &		515.074
	-45+15um	EC-P81302	Crushed	Metco 72F-NS	
	-45+11um	EC-P81303			
	-45+5um	EC-P81315			

Notes: 1.Can be customized according to customer specific requirements(Coarse powder/fine powder/Ultra-fine powder)
 2.Please dry the powder before using once it's affected with damp(120°C keep warm 1 hours)

Characteristic

- ◆Smooth coatings with fine micro-structure and high bond strengths.
- ◆Low oxidation and corrosion resistance.
- ◆Resists abrasion and erosion, good sliding wear and fretting resistance.
- ◆Service up to 500°C.
- ◆Used for general wear protection, wire drawing equipment, fan and compressor blades, pump seals and housing, machine parts, etc.

WC-Cr-Ni Series

Material Properties

Micro-hardness: 1000-1300HV_{0.05}
 Apparent density: 3.5-5.0 g/cm³
 Hall Flow: 16-30 s/50g
 Particle size ranges: 850um-5um

Coating properties

Bond Strength: >70Mpa
 Porosity: <1%

Specification and Manufacture

Chemistry	Size	Products	Manufacture	WOKA	H.C. Starck
Tungsten Carbide - Chromium - Nickel					
WC-20Cr-7Ni	-75+45um	EC-P4112	Agglomerated & Sintered		WOKA 3718
	-75+20um	EC-P4114			
	-53+20um	EC-P4101		WOKA 3701	551.088
	-45+15um	EC-P4102		WOKA 3702	551.074
	-38+10um	EC-P4104			
	-25+5um	EC-P4109			

Notes: 1. Can be customized according to customer specific requirements(Coarse powder/fine powder/Ultra-fine powder)
 2. Please dry the powder before using once it's affected with damp(120°C keep warm 1 hours)

Characteristic

- ◆Better corrosion resistance and lower cost than WC-Co-Cr.
- ◆Has good impact, cavitation and droplet erosion resistance with fair abrasion and slurry erosion resistance.
- ◆For oil drilling down-hole mandrels, offshore application couplings, quenching rolls, sluice gate and transport system hydraulic rods, ball valves.



WC-Ni Series

Material Properties

Micro-hardness: 800–1200 HV_{0.05}
 Apparent density: 4.8–6.0 g/cm³
 Hal Flow: 11–25 s/50g
 Particle size ranges: 850um–5um

Coating properties

Bond Strength: >70Mpa
 Porosity: <1%

Specification and Manufacture

Chemistry	Size	Products	Manufacture	WOKA	H.C. Starck
Tungsten Carbide – Nickel					
WC-10Ni	-75+45um	EC-P3112	Agglomerated & Sintered		
	-75+20um	EC-P3114			
	-53+20um	EC-P3101		WOKA 3301	
	-45+15um	EC-P3102		WOKA 3302	
	-38+10um	EC-P3104		WOKA 3305	
	-25+5um	EC-P3109			
WC-12Ni	-75+45um	EC-P3412	Agglomerated & Sintered		
	-75+20um	EC-P3414			
	-53+20um	EC-P3401			547.088
	-45+15um	EC-P3402			547.074
	-38+10um	EC-P3404			
	-25+5um	EC-P3409			

Notes: 1.Can be customized according to customer specific requirements(Coarse powder/fine powder/ultra-fine powder)
 2.Please dry the powder before using once it's affected with damp(120°C keep warm 1 hours)
 3.Provide another Manufacture – Sintered & Crushed

Characteristic

- ◆Resists hammer, fretting, abrasion and sliding wear.
- ◆More corrosion-resistant and tougher than WC-Co, but hardness is lower.
- ◆Cobalt-free: maybe used in radioactive environments.
- ◆Service up to 500°C.
- ◆For ball valves, gate valves, oil field equipment.

NiCr-Cr3C2 Series

Material Properties

Micro-hardness: 900–1300 HV_{0.05}
 Apparent density: 1.8–2.7 g/cm³
 Particle size ranges: 850um–5um

Coating properties

Bond Strength: >70Mpa
 Porosity: <1%

Specification and Manufacture

Chemistry	Size	Products	Manufacture	WOKA	H.C. Starck
Nickel Chromium – Chromium Carbide					
20Ni-Cr3C2	-75+45um	EC-P9112	Agglomerated & Sintered		
	-75+20um	EC-P9114			
	-53+20um	EC-P9101			
	-45+15um	EC-P9102		WOKA 7101/ WOKA 7102	578.074
	-38+10um	EC-P9104		WOKA 7105	
	-25+5um	EC-P9109			
25Ni-Cr3C2	-75+45um	EC-P9212	Agglomerated & Sintered	WOKA 7218	
	-75+20um	EC-P9214			
	-53+20um	EC-P9201		WOKA 7201	588.088
	-45+15um	EC-P9202		WOKA 7202	588.074/ 588.074
	-38+10um	EC-P9204		WOKA 7205	
	-25+5um	EC-P9209		WOKA 7210	

Notes: 1.Can be customized according to customer specific requirements(Coarse powder/fine powder/ultra-fine powder)
 2.Please dry the powder before using once it's affected with damp(120°C keep warm 1 hours)

Characteristic

- ◆Resists solid particle erosion, abrasion, tribocorrosion, cavitation.
- ◆Excellent hard chromium plating alternative for NaCl and NaOH environments.
- ◆Corrosion resistance against seawater.
- ◆Service temperature up to 870°C.
- ◆Used for hydraulic valves, furnace rolls in the steel industry, pump parts, boilers, etc.

Plasma Transferred Arc (PTA) Powder materials

Cast Tungsten Carbide – Cobalt/ Self –fusing Ni alloy Powder For Plasma Transferred Arc (PTA)

Classification	Method	Product	Manufacture	Morphology
Tungsten Carbide Cobalt + Self-Fusing Nickel Alloy				
WC Co Self-fusing Ni alloy	Sintered&Crushed	BD-P,X106	Blended	Spheroidal/Angular and Block
	Sintered&Crushed	BD-P,X108		Spheroidal/Angular and Block
	Sintered&Crushed	BD-P,X110		Spheroidal/Angular and Block
	Sintered&Crushed	BD-P,X112		Spheroidal/Angular and Block

Cast Tungsten Carbide/ Self –fusing Ni alloy Powder For Plasma Transferred Arc (PTA)

Classification	Method	Product	Manufacture	Morphology
Cast Tungsten Carbide / Self-Fusing Nickel Alloy				
CTC Self-fusing Ni alloy	BD-ZX101	CTC/Ni Alloy matrix	Blended	Angular / Spheroidal
	BD-ZSX101	CTC/SCWC/NiAlloy matrix		Angular / Spheroidal
	BD-ZSDX101	CTC/SCWC/MWC/Ni Alloy matrix		Angular / Spheroidal

Spherical Cast Tungsten Carbide/ Self –fusing Ni alloy Powder For Plasma Transferred Arc (PTA)

Classification	Method	Product	Manufacture	Morphology
Spherical Cast Tungsten Carbide / Self-fusing Ni alloy				
SCWC Self-fusing Ni alloy	EC-SX101	SCWC/Ni Alloy matrix	Blended	Spheroidal /Spheroidal
	EC-SDX101	SCWC/MWC/Ni Alloy matrix		Spheroidal /Angular

Mono-crystalline Tungsten Carbide/ Self –fusing Ni alloy Powder For Plasma Transferred Arc (PTA)

Classification	Method	Product	Manufacture	Morphology
Mono-crystalline Tungsten Carbide / Self-fusing Ni alloy				
MWC Self-fusing Ni alloy	EC-DX101	MWC/Ni Alloy matrix	Blended	Angular / Spheroidal
	EC-DZX101	MWC/CTC/Ni Alloy matrix		Angular / Spheroidal

Other Series

Material Properties

Micro-hardness: 800–1400 HV_{0.05}

Apparent density: 3.5–5.0g/cm³

Hall Flow: 16–30 g/50g

Particle size ranges: 850um–5um

Coating properties

Bond Strength: >70Mpa

Porosity: <1%

Specification and Manufacture

Chemistry	Size	Products	Manufacture	WOKA	H.C. Starck
Others					
WC-NiMoCrFeCo	~45+15um	EC-PO102	Agglomerated & Sintered		529.074
WC-9Co5Qr1Ni	~75+20um	EC-PC214		WOKA 3644	
WC-CrC-Cr-Ni	~45+15um	EC-PC302			

Notes: 1.Can be customized according to customer specific requirements(Coarse powder/fine powder/ultra-fine powder)

2.Please dry the powder before using once it's affected with damp(120°C keep warm 1 hours)

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