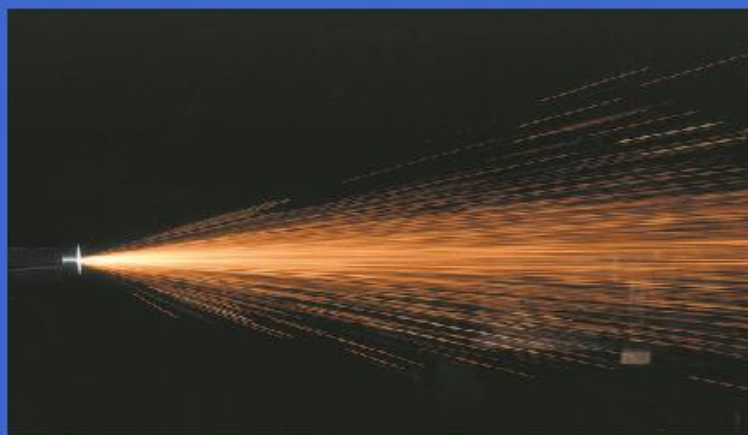




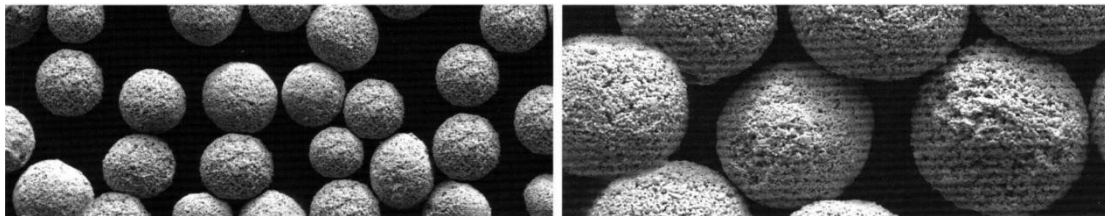
ROCKWELL

CARBIDE POWDERS LTD.
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THERMAL SPRAY POWDER



Thermal spraying techniques are coating processes in which melted (or heated) materials are sprayed onto a surface. Thermal spraying can provide thick coatings (approx. thickness range is 20 micrometers to several mm, depending on the process and feedstock), over a large area at high deposition rate as compared to other coating processes such as electroplating, physical, and chemical vapor deposition. Coating materials available for thermal spraying include metals, alloys, ceramics, plastics and composites.

Appearance:

Dark gray or metal-luster powder.

Specification:

-140+325Mesh, -200+400Mesh, -300+500Mesh

-45+15um, -45+11um, -38+5um

Or customized

Particle size ranges:

0.85mm-0.005mm

Different size range are available by specific requirement.

Method of Applications:

Thermal Spray, including HVOF, Plasma Spray, Flame Spray

Applications:

Widely used in mining, petroleum industry, electric power machinery

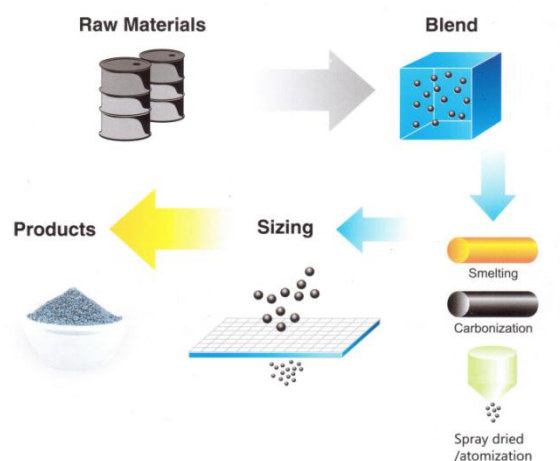
Advantages:

- Low cost
- The coatings increase wear resistance and corrosion resistance, prolong life time of parts
- Environmental-friendly
- Low processing temperature, heat effect on substrate is ignorable
- Coating thickness may reach 2mm at most
- Spraying by automation, greatly increase working efficiency

Character:

High wear resistance, corrosion resistance and high temperature resistance.

Process:



WC-Co-Cr Series			
Chemistry	Size	Products	Manufacture
WC-10Co-4Cr	-75+45um	RW102112	Agglomerated & Sintered
	-75+20um	RW102114	
	-53+20um	RW102101	
	-45+15um	RW102102	
	-38+10um	RW102104	
	-25+5um	RW102109	

Material Properties

Micro-hardness	1000-1400 HV0.3
Apparent density	4.5-5.6g/cm ³
Hall Flow	12-30 s/50g

Coating Properties

Bond Strength	>70Mpa
Porosity	<1%

Typical Properties and Application

- 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			
Chemistry	Size	Products	Manufacture
WC-12Co	-75+45um	RW101312	Agglomerated & Sintered
	-75+20um	RW101314	
	-53+20um	RW101301	
	-45+15um	RW101302	
	-38+10um	RW101304	
	-25+5um	RW101309	
WC-17Co	-75+45um	RW101412	Agglomerated & Sintered
	-75+20um	RW101414	
	-53+20um	RW101401	
	-45+15um	RW101402	
	-38+10um	RW101404	
	-25+5um	RW101409	
WC-12Co	-90+45um	RW101316	Sintered & Crushed
	-45+20um	RW101310	
	-45+15um	RW101302	
	-45+11um	RW101303	
	-45+5um	RW101315	

Material Properties

Micro-hardness 900-1400 HV0.05

Apparent density 4.3-5.5g/cm³

Hall Flow 12-30 s/50g

Coating Properties

Bond Strength >75Mpa

Porosity <1%

Typical Properties and Application(Agglomerated& Sintered)

- 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.

Typical Properties and Application(Sintered & Crushed)

- Hard, dense coatings with good abrasion, erosion and sliding wear resistance.
- Use for machine parts, pump housings etc.
- Used for general wear protection, wire drawing equipment, fan and compressor blades, pump seals and housing, machine parts, etc.

WC-Cr-Ni Series			
Chemistry	Size	Products	Manufacture
WC-20Cr-7Ni	-75+45um	RW104112	Agglomerated & Sintered
	-75+20um	RW104114	
	-53+20um	RW104101	
	-45+15um	RW104102	
	-38+10um	RW104104	
	-25+5um	RW104109	

Material Properties

Micro-hardness	1000-1300 HV0.3
Apparent density	3.5-5.0g/cm ³
Hall Flow	16-30 s/50g

Coating Properties

Bond Strength	>70Mpa
Porosity	<1%

Typical Properties and Application

- Better corrosion resistance and lower cost than WC-Co-Cr.
- Good impact, cavitation and droplet erosion resistance with fair abrasion and slurry erosion resistance
- For oil drilling down-hole mandrels, offshore, offshore application couplings, quenching rolls, sluice gate and transport system hydraulic rods, ball valves.
- Smooth coatings with fine microstructure and high bond strengths.
- Service up to 750°C

WC-Ni Series			
Chemistry	Size	Products	Manufacture
WC-10Ni	-75+45um	RW103112	Agglomerated & Sintered
	-75+20um	RW103114	
	-53+20um	RW103101	
	-45+15um	RW103102	
	-38+10um	RW103104	
	-25+5um	RW103109	
WC-12Ni	-75+45um	RW103412	Agglomerated & Sintered
	-75+20um	RW103414	
	-53+20um	RW103401	
	-45+15um	RW103402	
	-38+10um	RW103404	
	-25+5um	RW103409	

Material Properties

Micro-hardness	800-1200 HV0.3
Apparent density	4.8-6.0g/cm ³
Hall Flow	11-25 s/50g

Coating Properties

Bond Strength	>70Mpa
Porosity	<1%

Typical Properties and Application

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

Cr3C2-NiCr Series			
Chemistry	Size	Products	Manufacture
Cr3C2-20NiCr	-75+45um	RW109112	Agglomerated & Sintered
	-75+20um	RW109114	
	-53+20um	RW109101	
	-45+15um	RW109102	
	-38+10um	RW109104	
	-25+5um	RW109109	
Cr3C2-25NiCr	-75+45um	RW109212	Agglomerated & Sintered
	-75+20um	RW109214	
	-53+20um	RW109201	
	-45+15um	RW109202	
	-38+10um	RW109204	
	-25+5um	RW109209	

Material Properties

Micro-hardness 900-1300 HV0.05

Apparent density 1.8-2.7g/cm³

Coating Properties

Bond Strength >70Mpa

Porosity <1%

Typical Properties and Application

- 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 870C
- Used for hydraulic valves, furnace rolls in the steel industry, pump parts, boilers, etc

PTA WELDING POWDER

Customized Chemistry and Particle Size

Appearance:

Dark gray or brown powder. The color of the powder depends on its ingredient.

Specification:

-100+230 mesh,
-140+325mesh or customized

Advantages:

- Preparation work on substrate is easy.
- Increase wear resistance and impact resistance, prolong life time of parts.
- High temperature plasma (10000-30000°C) is able to melt almost all materials.
- Dilution rate is low (<5%), while bonding strength is high.
- Cladding or spraying by automation, greatly increase working efficiency.

Applications:

Mainly used for the surface protection at wear locations of heavy equipment, such as mining, oil drilling & exploring and debris transportation equipment.

Method of Applications:

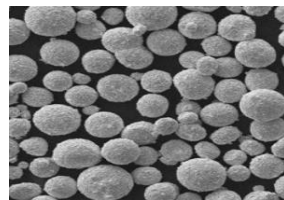
PTA bead welding
Laser Cladding



Blend Powders	Ni Matrix Content (wt.%)	Particle Size (um)	HV0.1 of Hard phase	Cladding Hardness (HRC)
Cast Tungsten Carbide+NiBSi	30-65	53-150 45-150 38-105	2000-2400	50-55
Cast-Tungsten Carbide+Ni45	30-65			52-58
Cast-Tungsten Carbide+Ni60	30-65			65-70
Spherical Cast-Tungsten Carbide+NiBSi	30-65	53-150 45-150 38-105	2700-3300	53-58
Spherical Cast-Tungsten Carbide+Ni45	30-65			55-61
Spherical Cast-Tungsten Carbide+Ni60	30-65			65-70
Macro-Crystalline Tungsten Carbide+NiBSi	30-65	53-150 45-150 38-105	1500-1900	42-47
Macro-Crystalline Tungsten Carbide+Ni45	30-65			45-50
Macro-Crystalline Tungsten Carbide+Ni60	30-65			60-65



Cast Tungsten Carbide+Ni Alloy Matrix



Spherical Cast-Tungsten Carbide+Ni45



Macro-Crystalline Tungsten Carbide+NiBSi



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