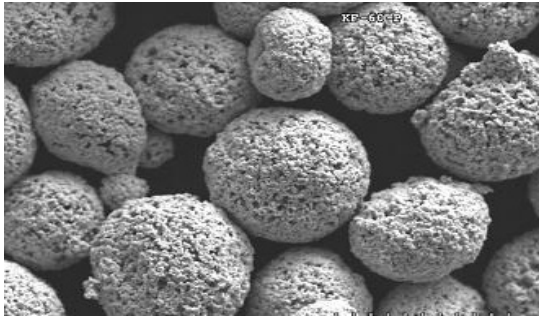


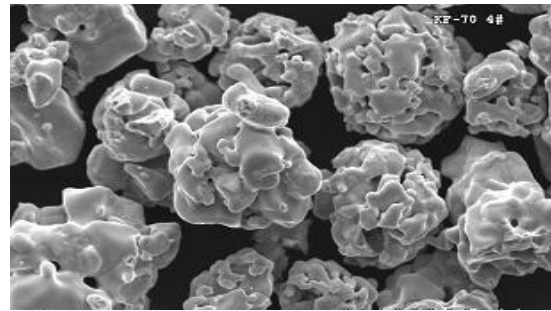
CARBIDE POWDERS

Powders composed of carbide as the hard phase and metals or alloys as the bonding phase are important materials for forming wear-resistant coatings. The bonding phase of this type of powders can prevent carbide from being oxidized and decomposed during thermal spraying stage. The carbide composite powders, especially the prealloying carbide composite powders, can create coatings possessing cemented carbide properties after thermal spraying.

Carbide Composite Powders exhibit high hardness and excellent wear resistance after plasma spraying or flame spraying. Among them, (Co, Ni) / WC coating can be used under lower temperature (<560°C) service conditions, while (NiCr, NiCrAl)/Cr₃C₂ coating can be used at higher temperature (>560°C). Moreover, (Co, Ni)/WC composite powder can also be used together with self-fluxing alloy powders as hardfacing materials for spraying welding or surfacing.



Spray Dried WC-Co Powder



Cr₃C₂-25 NiCr Powder

POWDER	PARTICLE SIZE (MESH)	TYPICAL COMPOSITION (%)	COATING FUNCTION & APPLICATIONS
TS-12 WC12Co Sintered	-325mesh+15µm	Co: 12 WC: balance	* Resistant to abrasion and erosion; * High hardness, wear resistance and dense; * Excellent wear-resistant coating at temperature up to 550°C; * Good for turbine-blades, camshafts, ratchets, piston rods, seals, sand throwing parts, motor-driven knives, measuring tools, etc.
TS-11C TS-11F Cobalt Clad Tungsten Carbide Composite Powder	-140+325 (TS-11C) -270mesh+10µm (TS-11F)	Co: 11.0~13.0 C: 5.1~5.5 W: Balance	
TS-12C Ditto	-140+325	Co: 15.0~17.5 C: 4.8~5.2 W: Balance	
TS-13C Ditto	-140+325	Co: 11.0~13.0 C: 2.4~2.8 W: Balance	
TS-14F Ditto	-325	Co: 15.0~17.5 C: 4.8~5.2 W: Balance	
TS-15C TS-15F Cobalt Clad Tungsten Carbide Composite Powder	-140+325 (TS-15C) -270mesh+10µm (TS-15F)	Co: 10.5~13.0 C: 5.1~5.5 Impurity < 1.5 W: Balance	

CARBIDE POWDERS

POWDER	PARTICLE SIZE (MESH)	TYPICAL COMPOSITION (%)	COATING FUNCTION & APPLICATIONS
TS-17 WC17Co Sintered	-270mesh+11µm	Co: 17 WC: balance	<ul style="list-style-type: none"> * Ideal for hard chrome replacement; * High toughness and fretting wear resistance; * Produces compressive coatings; * Well bonded smooth as-sprayed surfaces; * Can be ground to high finishes; * Application: pump seals, dumpvalves, shifter forks;
TS-17C Cobalt - Tungsten Carbide	-140+325	Co: 15.0~18.0 C: 4.8~5.4 Impurity < 1.5	<ul style="list-style-type: none"> * High hardness (Microhardness>950) & wear resistance; * Applicable to aircraft engine and high-duty machine parts (T<600°C);
TS-17F Cobalt - Tungsten Carbide	-270mesh+10µm	W: Balance	<ul style="list-style-type: none"> * Rc=55, resistant to fretting and grain abrasion; * Goods as coating for compressor vanes, slurry pump pistons and fan vanes.
TS-41 Nickel-Chromium Clad Chromium Carbide	-140+325	Ni-Cr: 75 Cr ₃ C ₂ : 25	<ul style="list-style-type: none"> * High hardness, resistant to wear and high temperature oxidation in the 500~850°C range; * Good for machines parts, turbine blades, seals, jet nozzles and shaft journals subject to wear by abrasives, hard surfaces and surfaces subject to particle erosion.
TS-501 Cr3C2 NiCr Spheroidal, Agglomerated	-325mesh+11µm	Ni-Cr: 25 Cr ₃ C ₂ : 75	<ul style="list-style-type: none"> * Good abrasion, particle erosion, cavitations and fretting resistance up to 815°C; * Produces dense erosion and corrosion resistant coating; * Oxidation and erosion resistant up to 900°C; * Good for tooling machines parts, pump housings
TS-55 Nickel-Clad Tungsten Carbide	-140+325	Ni: 11.0~13.0 C: 2.4~2.8 W: Balance	<ul style="list-style-type: none"> * High hardness & wear resistance;
TS-56 Nickel-Clad Tungsten Carbide	-140+325	Ni: 11.0~13.0 C: 5.1~5.5 W: Balance	<ul style="list-style-type: none"> * Good as wear resistant coating
TS-57 Nickel-Aluminum Clad Tungsten Carbide	-140+325	Ni: 8.0~12.0 Al: 2.0~3.0 WC: Balance	<ul style="list-style-type: none"> * High bonding strength, high hardness, wear resistance; * Dense coating and exothermic powder; * Good for cylinder piston rods, bushes, molding tool, turbine blades and ratchets
TS-66 Nickel Clad Chromium Carbide	-140+325	Ni: 25 Cr ₃ C ₂ : 75	<ul style="list-style-type: none"> * High hardness, resistant to wear and high temperature oxidation; * Good for wear resistant bearings and vehicle parts
TS-72 Nickel Clad Composite Carbide	-140+325	Ni: 85 WTiC ₂ : 15	<ul style="list-style-type: none"> * High hardness, applied as wear resistant coating at temperatures over 500°C
TS-117 Cobalt-Tungsten Carbide Self-fusing Alloy and Nickel-Aluminum Blend	-140+325	Co-WC: 75 Nickel Alloy & Ni/Al: Balance	<ul style="list-style-type: none"> * Resistant to wear and abrasion by hard surface and to fretting (T<540°C)
TS-160 Nickel-Aluminum-Chromium Carbide Composite Powder	-140+325	Ni: 15.0~17.0 Al: 3.0~5.0 Cr ₃ C ₂ : 79~81	<ul style="list-style-type: none"> * smooth, dense and strong coating; * Resistant to high temperature wear and oxidation; * Excellent bonding performance