

Praxair and TAFE thermal spray powders

Praxair Surface Technologies, Inc. and TAFE Incorporated is a global leader in the supply of **powders for thermal spray** and other industrial applications. With the world's most advanced powder manufacturing facility and an engineering staff dedicated to developing innovative powder **solutions**, we aim to exceed the needs of our growing markets. Our broad product line of MCrAlYs, alloys, carbides, and ceramic oxides, coupled with unparalleled powder **customization** capabilities, meets almost every thermal spray powder requirement, large or small.

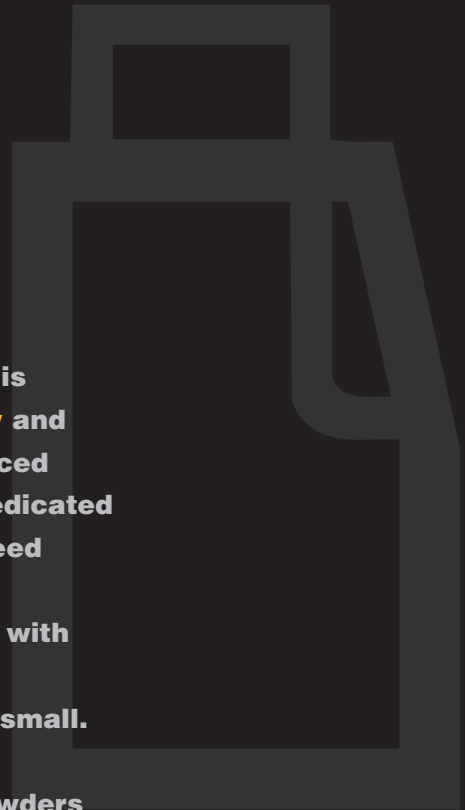
An ISO 9002 approved quality system assures that our powders are produced to the **most demanding standards**, including those of the aerospace, medical, gas turbine, petrochemical, and automotive industries. Our commitment as a provider of powder solutions means we go one step further – making certain that our powders are **perfectly compatible** with your process, to help you produce the engineered surface you need, each and every time.

Powder availability is assured through Praxair and TAFE's **capacity increases**, along with strategically located inventories placed throughout the industrialized world. Our global customer service, sales, field service and **application support teams** stand ready to meet your critical powder needs. For more information, please contact your local representative or contact our U.S. headquarters:

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	APS Air Plasma Spray
	FS Flame Spray
	HVOF High Velocity Oxygen-Fuel
	VPS Vacuum Plasma Spray (Low Pressure Plasma Spray)

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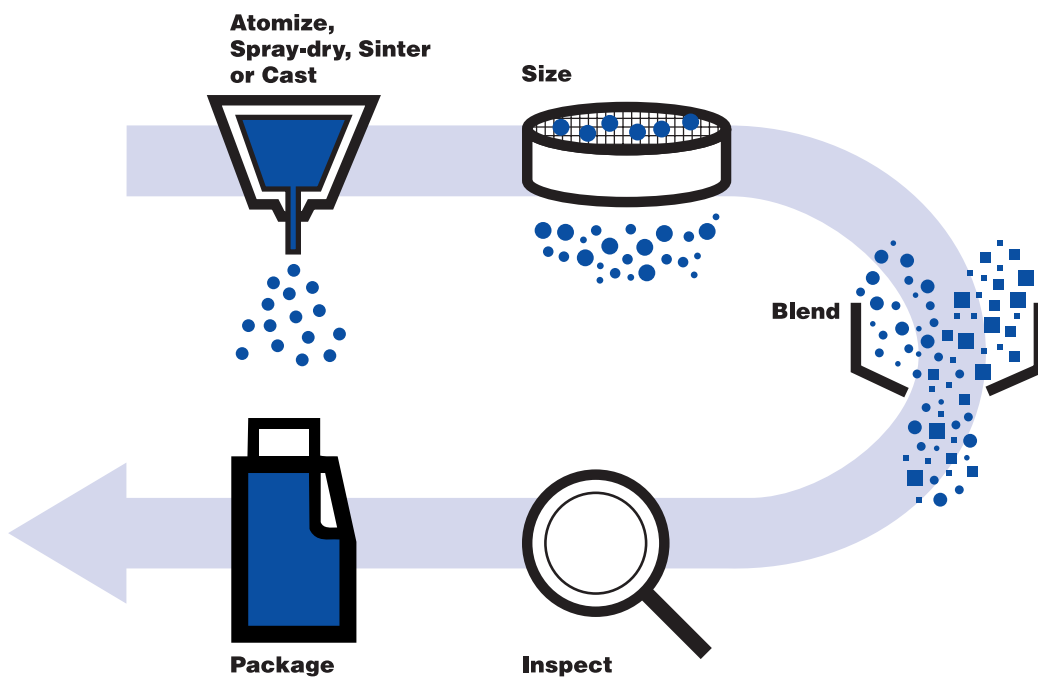
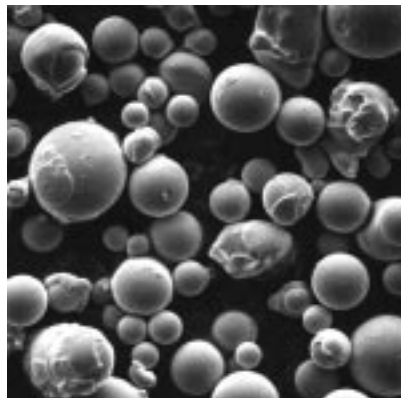
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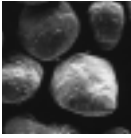

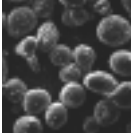


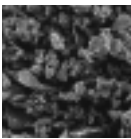
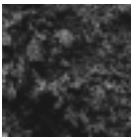





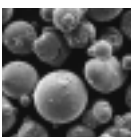



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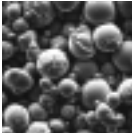


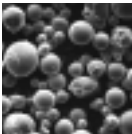


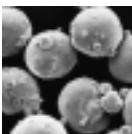

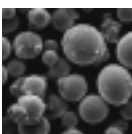




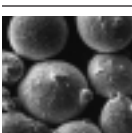

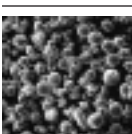



Pure Metal and Metal Alloy Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Aluminum Based Powders								
	Aluminum Atomized	Al 99.0 min	AL-104	53 sec 1.4 g/cm ³	-170/+325 mesh -90 µm/+45 µm	B50TF57 CLA	54NS-1	 <ul style="list-style-type: none"> • Corrosion protection coating • Good for repair of Al based parts • Very dense coating • Good for electrical conductivity
	Al-12 Si Atomized	Si 12.0 Al Rem	AL-102	46 sec 1.4 g/cm ³	-170/+325 mesh -90 µm/+45 µm	PWA 1335 CPW 235 EMS 57742 B50TF92 CLA	52C-NS	 <ul style="list-style-type: none"> • Good for repair of Al and Mg based parts • Harder and denser than pure Al
			AL-111	neg. 1.0 g/cm ³	-325 mesh/+5 µm -45 µm/+5 µm	PWA 1355	Amdry® 355	
	AEP-32 Sintered		AL-123			PMI 1311 EPS 10040		<ul style="list-style-type: none"> • Proprietary Rolls-Royce Allison electrophoretic material
	AEP-100 Sintered		AL-131			PMI 1350 EPS 10654		<ul style="list-style-type: none"> • Proprietary Rolls-Royce Allison electrophoretic material
Cobalt Based Powders								
	CoCrNiW (Similar to Co Alloy 31 and X40) Atomized	Cr 25.5 Ni 10.5 W 7.5 Co Rem	CO-103	neg. 4.0 g/cm ³	-325 mesh/+5 µm -45 µm/+5 µm	CPW 236 EMS 52432 XXIII DMR 33.008 MSRR 9507/23 PWA 1316	45VF-NS	 <ul style="list-style-type: none"> • Excellent oxidation resistance • Replaces WC in high temperature applications • Smooth as sprayed coating • Suited for repair of Co based parts
			CO-105/ CO-285-2	17 sec 4.0 g/cm ³	-200/+325 mesh -75 µm/+45 µm	PWA 1318 MSRR 9507/3 BMS 10-67-9 CPW 218	45C-NS	
			CO-285	17 sec 4.0 g/cm ³	-120/+325 mesh -125 µm/+45 µm	B50TF185 CLA	Amdry® X40	
			1245F	15 sec 4.2 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			
	CoCrWSiC (Similar to Co Alloy 6) Atomized	Cr 28.0 W 4.0 C 1.2 Si 1.0 Co Rem	CO-106-1	15 sec 4.4 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm			 <ul style="list-style-type: none"> • Excellent wear properties • Produces hard, dense coatings • High temperature wear and corrosion properties
			CO-106-4	17 sec 4.5 g/cm ³	-140/+325 mesh -106 µm/+45 µm			
			1256F	14 sec 4.5 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			

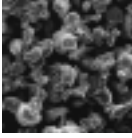
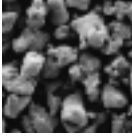
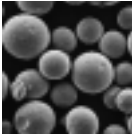
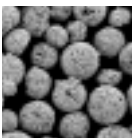
Pure Metal and Metal Alloy Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Cobalt Based Powders (continued)								
	CoMoCrSi (Similar to Tribaloy® 400) Atomized	CO-109	20 sec 3.2 g/cm ³	-325 mesh/+10 µm -45 µm/+10 µm	B50TF155 CLA EMS 52432 XVI BMS 10-67-15	66F-NS		<ul style="list-style-type: none"> • Intermetallic Laves phases provide excellent wear properties from room temperature to 1500°F(816°C) • Good hot hardness, oxidation and corrosion properties • Low coefficient of friction
		1247F	16 sec 3.4 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm				
	CoMoCrSi (Similar to Tribaloy® 800) Atomized	CO-111	19 sec 4.5 g/cm ³	-325 mesh/+10 µm -45 µm/+10 µm	B50TF190 CLA EMS 52432 XV PM 819-15	68F-NS-1		<ul style="list-style-type: none"> • Intermetallic Laves phases provide excellent wear properties from room temperature to 1500°F(816°C) • Good hot hardness, oxidation and corrosion properties • Low coefficient of friction
		1248T	15 sec 4.7 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm				
	CoCrWNiV Atomized	CO-114-2	13 sec 4.7 g/cm ³	-200/+325 mesh -75 µm/+45 µm	B50A842 CLA PWA 1314			<ul style="list-style-type: none"> • Excellent high temperature wear and oxidation properties • Serviceable up to 1350°F (732°C) • Hard dense coating suitable for repair of Co based parts
	CoCrNiWSi Atomized	CO-263-3	16 sec 4.4 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm	B50A489			<ul style="list-style-type: none"> • Good oxidation resistance • Superalloy used in aerospace applications
Copper Based Powders								
	CuNiIn Atomized	CU-101	21 sec 4.3 g/cm ³	-325 mesh/+10 µm -45 µm/+10 µm	B50TF72 CLB BMS 10-67-14	Amdry® 500F		<ul style="list-style-type: none"> • Excellent anti-fretting coating • Dense coatings with low porosity and oxide content
		CU-102	15 sec 4.3 g/cm ³	-170/+325 mesh -90 µm/+45 µm	B50TF72 CLA MSRR 9507/31 DMR 33.016 BMS 10-67-14	Amdry® 500C 58 NS		
	Cu-38Ni Atomized	CU-103	16 sec 4.4 g/cm ³	-200/+325 mesh -75 µm/+45 µm	B50TF42 CLA PWA 1369 PM 819-42	57NS		<ul style="list-style-type: none"> • Protects against fretting and galling • Dense coatings with low oxide content
	Cu-10Al-1Fe (Al-Bronze) Atomized	CU-104	20 sec 3.6 g/cm ³	-270 mesh/+5 µm -53 µm/+5 µm	BMS 10-67-2 DMS 2049 T1	51F-NS		<ul style="list-style-type: none"> • Good bearing material • Resistant to fretting and galling at low temperatures • Easily machined coating
		CU-104-2	20 sec 3.6 g/cm ³	-270 mesh/+10 µm -53 µm/+10 µm	PWA 1378-1	51F-NS-1		
		CU-104-5	19 sec 3.9 g/cm ³	-120/+325 mesh -125 µm/+45 µm	B50TF161 CLA	51NS		

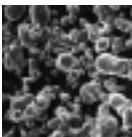




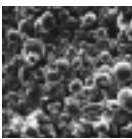









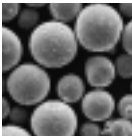


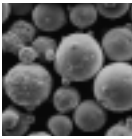




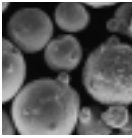


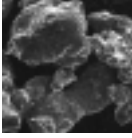


Pure Metal and Metal Alloy Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Iron Based Powders								
	FeCrNiMo (316 SS) Atomized	Cr 17.0 Ni 12.0 Mo 2.5 Fe Rem	FE-101	28 sec 2.9 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm		1003	<ul style="list-style-type: none"> • Excellent corrosion properties • Smooth coating which is easily machined • Good against fretting, cavitation and erosion • Good for dimensional repair and build-up
			FE-101-7	25 sec 2.8 g/cm ³	-140 /+325 mesh -106 µm/+45 µm		41C	
			1236F	22 sec 2.9 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			
	FeCr (410 SS) Atomized	Cr 12.5 Fe Rem	FE-108-2	20 sec 2.8 g/cm ³	-170 /+325 mesh -90 µm/+45 µm			<ul style="list-style-type: none"> • Moderately hard coating • Useful below 1200°F (649°C) • Good against fretting, cavitation and erosion • Excellent corrosion properties
			FE-108-3	28 sec 2.8 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm			
			FE-211-1	20 sec 3.0 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm			
			1234F	20 sec 3.0 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			
	FeCrNiCuNb (17-4 PH) Atomized	Cr 16.1 Ni 4.1 Cu 3.2 Nb 0.3 Fe Rem	FE-206-2	20 sec 2.7 g/cm ³	-170 /+325 mesh -90 µm/+45 µm			<ul style="list-style-type: none"> • Good wear properties • Useful below 1200°F (649°C)
			FE-206-3	28 sec 2.7 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm			
Molybdenum Based Powders								
	Molybdenum Agglomerated	Mo 99.0 min	MO-102	15 sec 5.7 g/cm ³	-170/+325 mesh -90 µm/+45 µm	PWA 1313 CPW 213 EMS 56705 PM 819-13	63 NS Amdry® 313X	<ul style="list-style-type: none"> • Self bonding to most metallic surfaces • Natural lubricity and high hardness promote good wear properties • Useful up to 600°F (316°C)

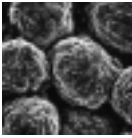


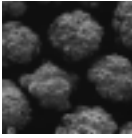


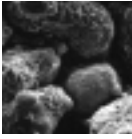





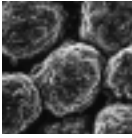


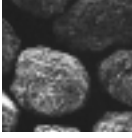


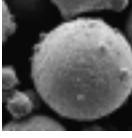

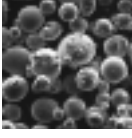






Pure Metal and Metal Alloy Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data		
Nickel Based Powders										
	Nickel Atomized	Ni 99.0 min	NI-101	neg. 3.3 g/cm ³	-325 mesh/+10 µm -45 µm/+10 µm	B50TF17 CLA/B	56F-NS	 	<ul style="list-style-type: none"> • Coatings are dense and moderately hard • Good corrosion and oxidation properties • Good for repair of Ni based and SS parts • Can be used for a ceramic bond coat • Easily machined • Useful up to 1000°F (538°C) 	
				NI-118	25 sec 3.3 g/cm ³	-200/+325 mesh -75 µm/+45 µm		56C-NS		 
					1166F	29 sec 3.4 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			
	Ni-20Cr Atomized	Cr 20.0 Ni Rem	NI-105	neg. 3.7 g/cm ³	-325 mesh/+5 µm -45 µm/+5 µm	PWA 1319	43VF-NS	 	<ul style="list-style-type: none"> • Good corrosion and oxidation properties • Produces bright and smooth coatings • Exhibits good bonding characteristics • Resists oxidation and corrosive gases up to 1800°F (982°C) • Suitable as a ceramic bond coat • Good for general repair and build-up 	
				NI-106	22 sec 3.4 g/cm ³	-230 mesh/+10 µm -63 µm/+10 µm	B50TF40 CLB PWA 1317 MSRR 9507/27	43F-NS		 
					NI-107	16 sec 4.3 g/cm ³	-140/+325 mesh -106 µm/+45 µm	B50TF40 CLA PWA 1315 MSRR 9507/8		43C-NS
				1262F	15 sec 4.4 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm				 
	Ni-50Cr Atomized	Cr 45.0+ Ni Rem	1260F	17 sec 4.3 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			 	<ul style="list-style-type: none"> • Coatings are resistant to corrosive gases (V and S) • Good boiler coating material 	
	NiCrSiFeB Atomized	Cr 11.0 Si 4.0 Fe 3.0 B 2.5 Ni Rem	1274H	16 sec 4.4 g/cm ³	-230 mesh/+20 µm -63 µm/+20 µm			 	<ul style="list-style-type: none"> • Hard machinable coating, as-sprayed or fused. • Resists abrasions, erosion, fretting and cavitation 	
	NiCrBSiFe Atomized	Cr 14.5 Fe 4.5 Si 4.5 B 3.2 Ni Rem	NI-167	16 sec 4.2 g/cm ³	-140/+325 mesh -106 µm/+45 µm		15E	 	<ul style="list-style-type: none"> • Self-fluxing type alloy • Good corrosion and wear properties • May be blended with a carbide and applied via spray/fuse process • Serviceable up to 1500°F (816°C) 	
				NI-167-1	16 sec 4.2 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm		15F		 
					1275H	16 sec 4.3 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			
	NiWCrSiB Atomized	W 17.0 Cr 15.0 Si 4.0 B 3.0 Ni Rem	1276F	16 sec 4.5 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm			 	<ul style="list-style-type: none"> • Hard machinable coating, as-sprayed or fused • Resists abrasion and erosion at high temperatures 	
	Ni-5Al Atomized	Al 5.0 Ni Rem	NI-185	25 sec 3.1 g/cm ³	-170/+325 mesh -90 µm/+45 µm	B50TF56 CLB PWA 1380 EMS 57746 T1C1 PM 819-56 DMR 33.011 CPW 490	480NS	 	<ul style="list-style-type: none"> • Water atomized Ni-Al powder • Good oxidation and corrosion properties • Can be used for a ceramic bond coat • Good for general repair and build-up • Thick coatings are possible • Easily machined 	

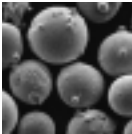
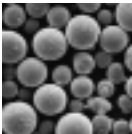



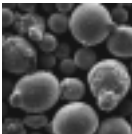


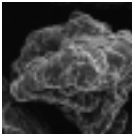








Pure Metal and Metal Alloy Powders

Powders

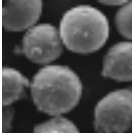

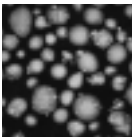

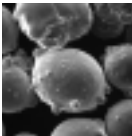

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Nickel Based Powders								
	Ni-5Al Composite	Al 5.0 Ni Rem	NI-109	16 sec 3.9 g/cm ³	-170/+325 mesh -90 μm/+45 μm	B50TF56 CLA PWA 1337 EMS 57746 T1C2 EMS 52432 XX CPW 247	450NS	  <ul style="list-style-type: none"> • Composite Ni-Al powder • Self-bonds to most metallic surfaces • Properties similar to NI-185
	Ni-5Al Clad	Al 5.0 Ni Rem	AI-1037	18 sec 3.8 g/cm ³	-170/+325 mesh -90 μm/+45 μm	PWA 1337 B50TF56 CLA	450NS	  <ul style="list-style-type: none"> • Clad Ni-Al powder • Properties similar to NI-185 • Superior deposition efficiency • Smoke-free sprayability
	Ni-20Al Composite	Al 18.7 Ni Rem	NI-108	22 sec 3.1 g/cm ³	-170/+270 mesh -90 μm/+53 μm	PWA 1321 B50TF13 CLB B50TF33 CLA	404NS	  <ul style="list-style-type: none"> • Self-bonds to most metallic surfaces • Useful up to 1200°F (649°C) • Good oxidation and corrosion properties
	Ni-18Cr-6Al Composite	Cr 18.0 Al 6.0 Ni Rem	NI-122	20 sec 3.3 g/cm ³	-120/+325 mesh -125 μm/+45 μm	B50TF119 CLA PWA 1347 EMS 57748 T1C2	443NS	  <ul style="list-style-type: none"> • Self-bonds to most metallic surfaces • Good oxidation and corrosion properties • Good for general repair and build-up • Thick coatings are possible
	NiCrAlFeMo Composite	Cr 8.0 Al 7.0 Fe 5.0 Mo 5.0 Ni Rem	NI-630	16 sec 3.9 g/cm ³	-140/+325 mesh -106 μm/+45 μm		444	  <ul style="list-style-type: none"> • Machinable stainless steel type coating • Self-bonds to most metallic surfaces • Good oxidation and corrosion properties • Good for repair and build-up • Thick coatings are possible • Useful up to 1600°F (871°C)
	Ni-5Al-5Mo Composite	Al 5.5 Mo 5.0 Ni Rem	NI-453	16 sec 3.9 g/cm ³	-170/+325 mesh -90 μm/+45 μm	EMS 57749 T1C2 EMS 52432 XIII B50TF166 CLA	447NS	  <ul style="list-style-type: none"> • Self-bonds to most metallic surfaces • Good toughness and hardness • Good for repair and build-up • Useful up to 600°F (316°C)
	NiCrCoTiW (Similar to Rene® 80) Atomized	Cr 14.0 Co 9.5 Ti 5.0 W 4.0 Mo 4.0 Ni Rem	NI-183	16 sec 4.2 g/cm ³	-140/+325 mesh -106 μm/+45 μm	B50TF183 CLA	Amdry® Rene 80	 <ul style="list-style-type: none"> • Good for repair and build-up of similar chemistry superalloy components
	NiCrFeNb-TaMoTi (Similar to Alloy 718) Atomized	Cr 19.0 Fe 18.0 Nb+Ta 5.1 Mo 3.1 Ti 1.0 Ni Rem	NI-202	16 sec 4.3 g/cm ³	-120/+325 mesh -125 μm/+45 μm	B50TF202 CLA	Amdry® 718	 <ul style="list-style-type: none"> • Excellent high temperature oxidation and corrosion properties
			NI-202-1	16 sec 4.1 g/cm ³	-170/+325 mesh -90 μm/+45 μm	B50TF202 CLB	Amdry® 718 CLB	 <ul style="list-style-type: none"> • Good for repair and build-up of similar chemistry superalloy components
			NI-202-2	19 sec 4.3 g/cm ³	-325 mesh/+10 μm -45 μm/+10 μm		1006	  <ul style="list-style-type: none"> • Useful up to 1800°F (982°C)
			NI-202-3	19 sec 4.1 g/cm ³	-325 mesh/+20 μm -45 μm/+20 μm	B50TF202 CLD		 <ul style="list-style-type: none"> • Useful up to 1800°F (982°C)
			1278F	16 sec 4.3 g/cm ³	-270/+20 mesh -53 μm/+20 μm			 <ul style="list-style-type: none"> • Useful up to 1800°F (982°C)

Pure Metal and Metal Alloy Powders

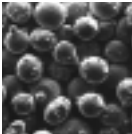





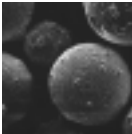



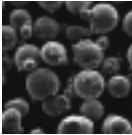

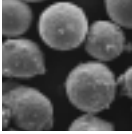

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Nickel Based Powders								
	Proprietary Superalloys Atomized	NI-256			B50TF242 CLA			<ul style="list-style-type: none"> • Proprietary alloys • Available to OEM approved users only • Product data available through OEM
		NI-256-1			B50TF242 CLB			
		NI-256-2			B50TF242 CLC			
		NI-365-2			B50TF271 CLC			
		NI-365-3			B50TF271 CLB			
	NiCrMoNb (Similar to Alloy 625) Atomized	NI-328	24 sec 3.9 g/cm ³	-325 mesh/+10 µm -45 µm/+10 µm		1005		<ul style="list-style-type: none"> • Excellent high temperature oxidation and corrosion properties • Good for repair and build-up of similar chemistry superalloy components • Useful up to 1800°F (982°C)
		NI-328-1	16 sec 4.3 g/cm ³	-170/+325 mesh -90 µm/+45 µm		Amdry® 625		
		1265F	15 sec 4.4 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm				
	NiCrMoW (Similar to Alloy C/C-276) Atomized	NI-544	16 sec 4.3 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm				<ul style="list-style-type: none"> • Excellent high temperature oxidation and corrosion properties • Good for repair and build-up of similar chemistry superalloy components
		1269F	14 sec 4.5 g/cm ³	-270 mesh/+20 µm -53 µm/+20 µm				
	Ni-25 Graphite Clad	NI-114	43 sec 1.8 g/cm ³	-170/+325 mesh -90 µm/+45 µm	PWA 1352-1	307-NS		<ul style="list-style-type: none"> • Coatings are lubricious and suited for friction applications • Flame spraying offers good abrasability • Sacrificial coatings good for clearance control • Useful up to 900°F (482°C)
		NI-114-1	49 sec 1.1 g/cm ³	-100 mesh/+30 µm -150 µm/+30 µm	MSRR 9507/6	307NS-2 2223		
		NI-114-2	50 sec 1.1 g/cm ³	-170 mesh/+30 µm -90 µm/+30 µm	MSRR 9507/12 EMS 56754	307NS-3 2224		
		NI-120	49 sec 1.6 g/cm ³	-170 mesh/+30 µm -90 µm/+30 µm	B50TF52 CLB	307NS-3 2224		
	Ni-15 Graphite Clad	NI-115	33 sec 2.3 g/cm ³	-120/+325 mesh -125 µm/+45 µm	B50TF53 CLB	308 NS-3 2241		<ul style="list-style-type: none"> • Coatings are lubricious and suited for friction applications • Flame spraying offers good abrasability • Sacrificial coatings good for clearance control • Useful up to 900°F (482°C) • Better erosion resistance than 75/25
		NI-126	35 sec 1.8 g/cm ³	-170 mesh/+30 µm -90 µm/+30 µm	PWA 1352-2	308 NS 2242		
		NI-126-1	44 sec 1.7 g/cm ³	-170 mesh/+30 µm -90 µm/+30 µm	EMS 56755 E	308 NS-1 2244		

Powders







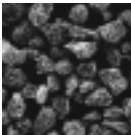


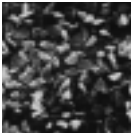

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Cobalt Based Powders								
 <p>Proprietary Co MCrAlYs Atomized</p>		CO-110			PWA 1348-2	Amdry® 345	 <ul style="list-style-type: none"> • Proprietary alloys • Available to OEM approved users only • Product data available through OEM 	
		CO-110-1			PWA 1348-3			
		CO-241			GT-20			
		CO-242			GT-29			
		CO-249			GT-33			
		CO-260-3			ES9-362 A			
		CO-260-12			ES9-362 B			
		CO-301			SICOAT 2231			
 <p>CoNiCrAlY Atomized</p> <p>Ni 32.0 Cr 21.0 Al 8.0 Y 0.5 Co Rem</p>		CO-127	18 sec 3.6 g/cm ³	-325 mesh/+5 µm -45 µm/+5 µm	CPW 528-1	Amdry® 9951	 <ul style="list-style-type: none"> • Excellent corrosion and oxidation properties up to 1900°F (1038°C) • Heat treating is required for optimum performance • Typically used for either a TBC bondcoat or environmental protection coating 	
		CO-159	18 sec 3.6 g/cm ³	-200/+400 mesh -75 µm/+38 µm	CPW 528-2			
		CO-210-1	17 sec 3.5 g/cm ³	-325 mesh/+10 µm -45 µm/+10 µm	B50TF195 CLA EMS 57741 GB	Amdry® 9954		
		CO-210-24	17 sec 3.7 g/cm ³	-325 mesh/+20 µm -45 µm/+20 µm				
		CO-211	19 sec 3.5 g/cm ³	-170/+325 mesh -90 µm/+45 µm	MSRR 9507/47 PM 819-58 EMS 57741 GA	Amdry® 995C		
		CO-211-3	20 sec 3.7 g/cm ³	-100/+230 mesh -150 µm/+63 µm	MSRR 9537/1C MSRR 9507/57			
Nickel Based Powders								
 <p>Proprietary Ni MCrAlYs Atomized</p>		NI-130			PWA 1365-1	Amdry® 365-1	 <ul style="list-style-type: none"> • Proprietary alloys • Available to OEM approved users only • Product data available through OEM 	
		NI-171			PWA 1365-2 CPW 387 PM 819-51	Amdry® 365-2		
		NI-191			PWA 1376			
		NI-192			PWA 1386-1	Amdry® 386		
		NI-192-8			PWA 1386-2			
		NI-289			PWA 1373	Amdry® 373		
		NI-535			SV-20	SM 4469		
		NI-548			SV-30			
		NI-666			SICOAT 2453			
		NI-832			SV-349			

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Nickel Based Powders (continued)								
	Ni-22Cr-10Al-1Y Atomized	Cr 22.0 Al 10.0 Y 1.0 Ni Rem	NI-164/ NI-211	20 sec 3.6 g/cm ³	-140/+270 mesh -106 μm/+53 μm	B50TF162 CLA B50TF192 CLA DMR 33.090 PM 819-44	Amdry® 962	 • Good diffusional stability and oxidation properties • Useful up to 1800°F (982°C) • Typically used for a TBC bondcoat
			NI-164-2	17 sec 3.8 g/cm ³	-200/+325 mesh -75 μm/+45 μm	M3960 EMS 57737 II	Amdry® 962	
			NI-343	neg. 3.8 g/cm ³	-325 mesh/+10 μm -45 μm/+10 μm			  
	Ni-31Cr-11Al-0.1Y Atomized	Cr 31.0 Al 11.3 Y 0.7 Ni Rem	NI-246-3	35 sec 3.8 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm			  • Good diffusional stability and oxidation properties • Useful up to 1800°F (982°C) • Typically used for a TBC bondcoat
			NI-246-4	17 sec 3.7 g/cm ³	-170/+400 mesh -90 μm/+38 μm	EMS 57737 I EMS 52432 XXI PM 819-29	Amdry® 964	
	Ni-23Cr-6Al-0.5Y Atomized	Cr 23.0 Al 6.0 Y 0.5 Ni Rem	NI-278	16 sec 4.0 g/cm ³	-170/+325 mesh -90 μm/+45 μm		Amdry® 963	 • Good diffusional stability and oxidation properties • Useful up to 1800°F (982°C) • Typically used for a TBC bondcoat
	Ni-20Cr-9Al-0.2Y Atomized	Cr 20.0 Al 9.0 Y 0.2 Ni Rem	NI-292	17 sec 3.7 g/cm ³	-200/+325 mesh -75 μm/+45 μm	M3972 EMS 57737 III		 • Good diffusional stability and oxidation properties • Useful up to 1800°F (982°C) • Typically used for a TBC bondcoat

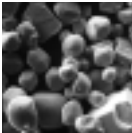
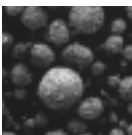

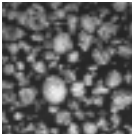
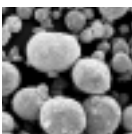

Ceramic Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Aluminum Oxide Based Powders								
	Al ₂ O ₃ Sintered	Al ₂ O ₃ 99.0 min	ALO-101	neg. 1.1 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm	PWA 1310	105 NS	 • Good for abrasion, erosion and sliding wear • Good in alkali and acid environments
		Al ₂ O ₃ 99.3 min	AI-110HP	neg. 1.4 g/cm ³	-22 μm/+5 μm	MSSR9507/9	105 SFP	 • Excellent dielectric properties • Useable between 1550-3000°F (843-1649°C)
	Al ₂ O ₃ - 3TiO ₂ Sintered	TiO ₂ 3.0 Al ₂ O ₃ Rem	ALO-105	neg. 1.6 g/cm ³	-53 μm	A50TF87 CLA EMS 52432 XXV	101 NS	 • Good for abrasion, erosion and sliding wear • Good in alkali and acid environments
			ALO-159	neg. 1.6 g/cm ³	-140/+325 mesh -106 μm/+45 μm	A50TF87 CLB PWA 1311 DMR 33.013 CPW 281	101 B-NS	 • Requires grinding
	Al ₂ O ₃ - 13TiO ₂ Sintered	TiO ₂ 13.0 Al ₂ O ₃ Rem	ALO-187	neg. 1.6 g/cm ³	-325 mesh/+10 μm -45 μm/+10 μm		130	 • Properties similar to Al ₂ O ₃ -13TiO ₂ , but softer and less resistant to chemicals
			ALO-188	neg. 1.2 g/cm ³	-31 μm/+5 μm		130 SF	 • Useable up to 1000°F (538°C)
	Al ₂ O ₃ - 40TiO ₂ Fused	TiO ₂ 40.0 Al ₂ O ₃ Rem	ALO-121	neg. 1.6 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm		131 VF	 • Properties similar to Al ₂ O ₃ -13TiO ₂ , but softer and less resistant to chemicals • Useable up to 1000°F (538°C) • Excellent finishing properties

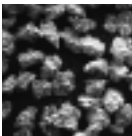







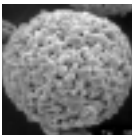


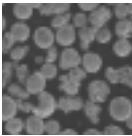

Ceramic Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Chromium Oxide Based Powders								
	Cr ₂ O ₃ Reacted and Sintered	Cr ₂ O ₃ 99.0 min	CRO-131	neg. 2.5 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm	CPW 320		<ul style="list-style-type: none"> • Hard, dense wear resistant coatings • Insoluble in acids, alkalis and alcohol • Useable up to 1000°F (540°C) • Excellent engraving properties
			CRO-167	neg. 2.4 g/cm ³	-325 mesh/+10 μm -45 μm/+10 μm			
			CRO-167-1	neg. 2.5 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm			
			CRO-172	46 sec 2.6 g/cm ³	-325 mesh/+20 μm -45 μm/+20 μm			
			CRO-174	neg. 2.4 g/cm ³	-22/+5 μm			
			CRO-179	neg. 2.5 g/cm ³	-31 μm /+10 μm			
	Cr ₂ O ₃ - SiO ₂ -TiO ₂ Composite	SiO ₂ 5.0 TiO ₂ 3.0 Cr ₂ O ₃ Rem	CRO-192	neg. 1.4 g/cm ³	-270 mesh/+10 μm -53 μm/+10 μm		136F	<ul style="list-style-type: none"> • Similar properties to Cr₂O₃ • Hard, dense wear resistant coatings • Resists impact better than Cr₂O₃
Zirconium Oxide Based Powders								
	ZrO ₂ - 22MgO Fused	MgO 22.0 ZrO ₂ Rem	ZRO-103	neg. 2.3 g/cm ³	-200 mesh/+10 μm -75 μm/+10 μm	A50TF155 CLA PWA 1333 EMS 52432 XXVI	210 NS-1 Amdry® 333	<ul style="list-style-type: none"> • Good thermal barrier properties • Resistant to molten metals • Good particle erosion resistance • Useful up to 1700°F (927°C)
	ZrO ₂ - 8Y ₂ O ₃ Agglomerated and Sintered	Y ₂ O ₃ 7.5 ZrO ₂ Rem	ZRO-182	41 sec 1.8 g/cm ³	-140/+325 mesh -106 μm/+45 μm	A50TF278 EMS 57750 T1	204 NS	<ul style="list-style-type: none"> • Excellent thermal barrier properties • Stabilizes during spray process • Useful up to 2450°F (1343°C)
			AI-1075	30 sec 2.3 g/cm ³	-140/+325 mesh -106 μm/+45 μm	PWA 1375 A50TF278	204 NS	
			1484I	40 sec 1.9 g/cm ³	-140/+325 mesh -106 μm/+45 μm		204 NS	
	ZrO ₂ - 12Y ₂ O ₃ Agglomerated and Sintered	Y ₂ O ₃ 12 ZrO ₂ Rem	AI-1078	31 sec 2.2 g/cm ³	-120 mesh/+15 μm -125 μm/+15 μm	PWA 36375		<ul style="list-style-type: none"> • Excellent thermal barrier properties • Stabilizes during spray process • Useful up to 2100°F (1150°C)
	ZrO ₂ - 20Y ₂ O ₃ Agglomerated and Sintered	Y ₂ O ₃ 20 ZrO ₂ Rem	AI-1066	29 sec 2.3 g/cm ³	-120 mesh/+15 μm -125 μm/+15 μm	PWA 36087-2	202 NS	<ul style="list-style-type: none"> • Very good thermal barrier properties • Stabilizes during spray process • Useful up to 1550°F (845°C)

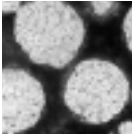



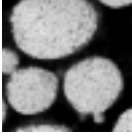



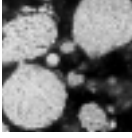



Carbide Powders

Powders

		Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Chromium Carbide Based Powders									
	Cr₃C₂ Sintered	Cr ₃ C ₂ 99.0 min	CRC-105	neg. 2.3 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm	PWA 1304	70F-NS		<ul style="list-style-type: none"> • Usually blended with a metal for spraying • Hard and wear resistant • Useful up to 1600°F (871°C)
			CRC-107	30 sec 2.4 g/cm ³	-140/+325 mesh -106 μm/+45 μm	PWA 1306	70C-NS		
	Cr₃C₂-7NiCr Blended	Ni 5.5 C 12.5 Cr Rem	CRC-184	neg. 2.4 g/cm ³	-325 mesh/+10 μm -45 μm/+10 μm	PWA 1364	82VF-NS 3005		<ul style="list-style-type: none"> • Similar to 75/25 Cr₃C₂-NiCr, but higher Cr₃C₂ increases hardness • Good hot gas and corrosion resistance • Hard and wear resistant • Useful up to 1600°F (871°C)
	Cr₃C₂-7NiCr Blended	Ni 20.0 C 10.0 Cr Rem	CRC-106	neg. 2.5 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm	AMS 7875 B50TF137 CLA MSRR 9507/17 M3965 PM 819-05 EMS 52432 II	81 VF-NS 3004		<ul style="list-style-type: none"> • Excellent for high temperature cavitation, abrasion and sliding wear • Good hot gas and corrosion resistance • Hard and wear resistant • Useful up to 1600°F (871°C)
			CRC-108	30 sec 2.5 g/cm ³	-140 mesh/+20 μm -106 μm/+20 μm	B50TF137 CLB PWA 1307 MSRR 9507/2 EMS 52432 II	81 NS		
	Cr₃C₂-25NiCr Agglomerated and Sintered	Ni 20.0 C 10.0 Cr Rem	1375VM	32 sec 2.3 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm		Amdry® 5260		<ul style="list-style-type: none"> • Excellent for high temperature cavitation, abrasion and sliding wear • Good hot gas and corrosion resistance • Very dense and hard coatings • Useful up to 1600°F (871°C)
			1375VF	neg. 2.3 g/cm ³	-400 mesh/+10 μm -38 μm/+10 μm				
	Cr₃C₂-25NiCr Densified	Ni 20.0 C 10.0 Cr Rem	1376T	19 sec 3.1 g/cm ³	-270 mesh/+20 μm -53 μm/+20 μm				<ul style="list-style-type: none"> • Excellent for high temperature cavitation, abrasion and sliding wear • Good hot gas and corrosion resistance • Exceptional flow • Useful up to 1600°F (871°C)

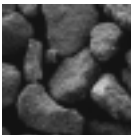



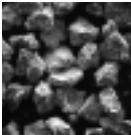
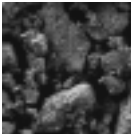
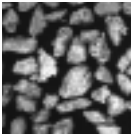
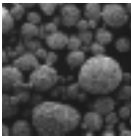
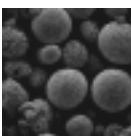
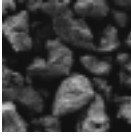
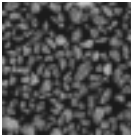
Carbide Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Chromium Carbide Based Powders (continued)								
 <p>CrC-30NiCr Activated</p>	Ni 8.0 C 4.0 Cr Rem	CRC-410	17 sec 3.9 g/cm ³	-270 mesh/+15 μm -53 μm/+15 μm				<ul style="list-style-type: none"> • Improved DE and stress properties over traditional blended CrC-NiCr • Excellent for high temperature cavitation, abrasion and sliding wear • Good hot gas and corrosion resistance • Useful up to 1600°F (871°C)
		CRC-410-1	19 sec 3.7 g/cm ³	-325 mesh/+10 μm -325 μm/+10 μm				
		CRC-410-2	17 sec 3.9 g/cm ³	-140/+325 mesh -106 μm/+45 μm				
 <p>CrC-65NiCr Activated</p>	Ni 10.0 C 2.0 Cr Rem	CRC-415	18 sec 4.0 g/cm ³	-270 mesh/+15 μm -53 μm/+15 μm				<ul style="list-style-type: none"> • Similar to CRC-410, with improved ductility, toughness and corrosion resistance but with lower hardness
		CRC-415-1	20 sec 3.8 g/cm ³	-325 mesh/+10 μm -325 μm/+10 μm				
		CRC-415-2	17 sec 3.9 g/cm ³	-140/+325 mesh -106 μm/+45 μm				
 <p>CrC-40NiCr Activated</p>	Ni 22.0 C 3.4 Cr Rem	CRC-425	17 sec 4.0 g/cm ³	-270 mesh/+15 μm -53 μm/+15 μm				<ul style="list-style-type: none"> • Similar to CRC-410, but with improved ductility and better toughness with slightly lower hardness
		CRC-425-1	20 sec 3.9 g/cm ³	-325 mesh/+10 μm -325 μm/+10 μm				
		CRC-425-2	17 sec 3.8 g/cm ³	-140/+325 mesh -106 μm/+45 μm				

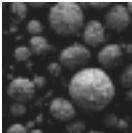


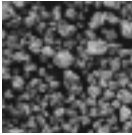

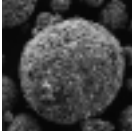

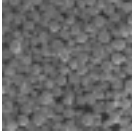

Carbide Powders

Powders

	Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Tungsten Carbide Based Powders								
	WC-8Co Sintered	Co 8.0 C 5.2 min W Rem	AI-1071	20 sec 5.0 g/cm ³	-200/+325 mesh -75 μm/+45 μm			<ul style="list-style-type: none"> • Commercial grade of WC-Co • Dense, hard wear resistant coating • Useful up to 900°F (482°C)
			AI-1171	neg. 5.0 g/cm ³	-325/+15 μm -45 μm/+15 μm		 	
	WC-12Co Cast	Co 11.0 C 3.9 W Rem	WC-104	12 sec 6.1 g/cm ³	-200/+325 mesh -75 μm/+45 μm	PWA 1302 EMS 57745	71NS Amdry® 302	<ul style="list-style-type: none"> • Excellent low temperature wear properties • Dense, hard coating with marginal oxidation and corrosion resistance • Useful up to 900°F (482°C)
			WC-106	neg. 5.9 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm	PWA 1379-2 AMS 7879 BMS 10-67-1	71VF-NS Amdry® 301	
	WC-12Co Sintered	Co 11.0 C 4.0 W Rem	1320Q	neg. 5.0 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm		71 VF-NS Amdry® 301	<ul style="list-style-type: none"> • Excellent low temperature wear properties • Dense, hard coating with marginal oxidation and corrosion resistance • Useful up to 900°F (482°C)
	WC-12Co Sintered	Co 12.0 C 5.3 W Rem	WC-114	16 sec 4.9 g/cm ³	-325 mesh/+10 μm -45 μm/+10 μm	AMS 7880 B50TF27 CLA/B PM 819-25	72F-NS	<ul style="list-style-type: none"> • Excellent low temperature wear properties • Dense, hard coating with marginal oxidation and corrosion resistance • Useful up to 900°F (482°C)
			WC-489-1	16 sec 4.9 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm			
	WC-12Co Agglomerated and Sintered	Co 12.0 C 5.4 W Rem	1342VM	20 sec 4.4 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm		SM 5812	<ul style="list-style-type: none"> • Similar properties as other WC-12Co • Densified structure with fine carbide dispersion promotes finer microstructure, better DE and denser, smoother coatings • Excellent flowability
			1342VF	18 sec 4.3 g/cm ³	-400 mesh/+10 μm -38 μm/+10 μm		2004	
	WC-17Co Agglomerated and Sintered	Co 17.0 C 5.3 W Rem	1343VM	20 sec 4.3 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm		Amdry® 9831	<ul style="list-style-type: none"> • Higher Co levels provides better toughness, impact strength and ductility than WC-12Co • Densified structure promotes superior coating density and powder flow • Excellent flowability
			1343V	18 sec 4.4 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm	PWA 36331-1	73F 73F-NS-2	
			1343VF	neg. 4.2 g/cm ³	-400 mesh/+10 μm -38 μm/+10 μm		2005NS	
	WC-10Ni Agglomerated and Sintered	Ni 10.5 C 3.6 W Rem	1310VM	20 sec 4.4 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm			<ul style="list-style-type: none"> • Better corrosion protection than WC-Co • Excellent low temperature wear properties up to 900°F (482°C) • Superior deposition efficiency
			1310VF	19 sec 4.5 g/cm ³	-400 mesh/+10 μm -38 μm/+10 μm			
	WC-Co-Cr Sintered	Co 10.0 Cr 4.0 C 5.3 W Rem	WC-113	neg 4.5 g/cm ³	-325 mesh/+5 μm -45 μm/+5 μm			<ul style="list-style-type: none"> • Improved oxidation and corrosion protection over WC-Co and WC-Ni • Excellent low temperature wear properties • Useful up to 900°F (482°C)
			WC-436-1	18 sec 4.5 g/cm ³	-325 mesh/+15 μm -45 μm/+15 μm			

Carbide Powders

Powders

		Nominal Chemistry	Powder Name	Flow Density	Size	Approved Specs	Similar Powders	Spray Process	Application Data
Tungsten Carbide Based Powders									
	WC-Co-Cr Agglomerated and Sintered	Co 9.5 C 5.2 W Rem	1350VM	19 sec 4.5 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm				<ul style="list-style-type: none"> • Similar properties as other WC-Co-Cr • Densified structure with fine carbide dispersion promotes finer microstructure, better DE and denser, smoother coatings • Excellent flowability
			1350VF	18 sec 4.6 g/cm ³	-400 mesh/+10 µm -38 µm/+10 µm		Amdry® 5843		
	WC-CrC-Ni Sintered	Cr 20.0 Ni 6.0 C 5.8 W Rem	WC-496	21 sec 3.2 g/cm ³	-325 mesh/+15 µm -45 µm/+15 µm				<ul style="list-style-type: none"> • Superior oxidation and corrosion properties than other tungsten carbide based material • Better chemical resistance than other tungsten carbide based materials • Useful up to 1400°F (760°C)
	WC-CrC-Ni Agglomerated and Sintered	Cr 21.0 Ni 6.0 C 5.0 W Rem	1356VM	20 sec 4.4 g/cm ³	-325 mesh /+15 µm -45 µm/+15 µm				<ul style="list-style-type: none"> • Similar properties as other WC-CrC-Ni • Densified structure with fine carbide dispersion promotes finer microstructure, better DE and denser, smoother coatings • Excellent flowability
	WC-12Co +50Ni SF Blended	Ni 35.0 Cr 8.0 Co 6.0 C 3.0 W Rem	1334F	22 sec 4.3 g/cm ³	-270 mesh /+15 µm -53 µm/+15 µm				<ul style="list-style-type: none"> • Excellent combination of abrasion resistance and toughness • Economical solution to severe wear applications

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