

## Powder Solutions

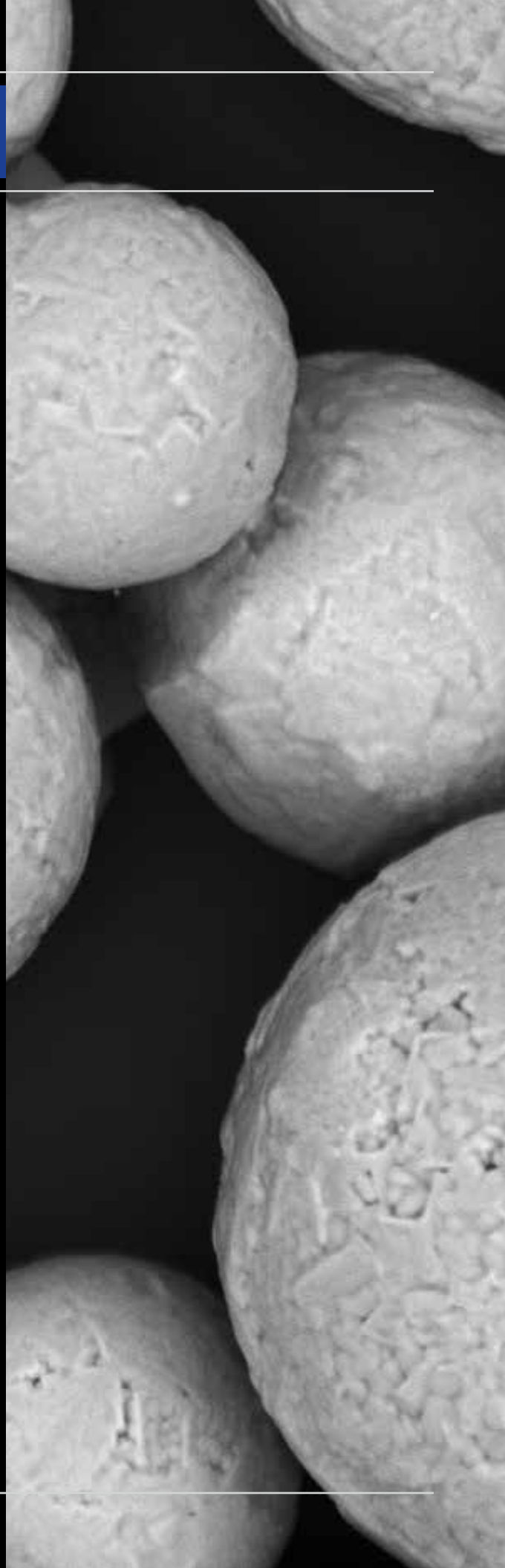
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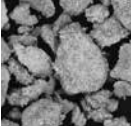
Over the past decade, we have invested in our manufacturing facility to assure availability of product and the highest levels of quality from our manufacturing processes in an efficient and safe environment. Our quality laboratory is registered as an ISO 9001:2008, NADCAP AS7101 and AS9100 Rev C facility and multiple OEM certifications. We can perform most quality tests on our standard production powders in our own state-of-the-art facility. Our commitment as a provider of powder solutions ensures that we take every step to help you produce the exact engineered surface you need.

Our global customer service, sales, distribution, and field service teams stand ready to meet your critical powder needs. For additional information, please contact your local representative or our headquarters in the United States.

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WC-114

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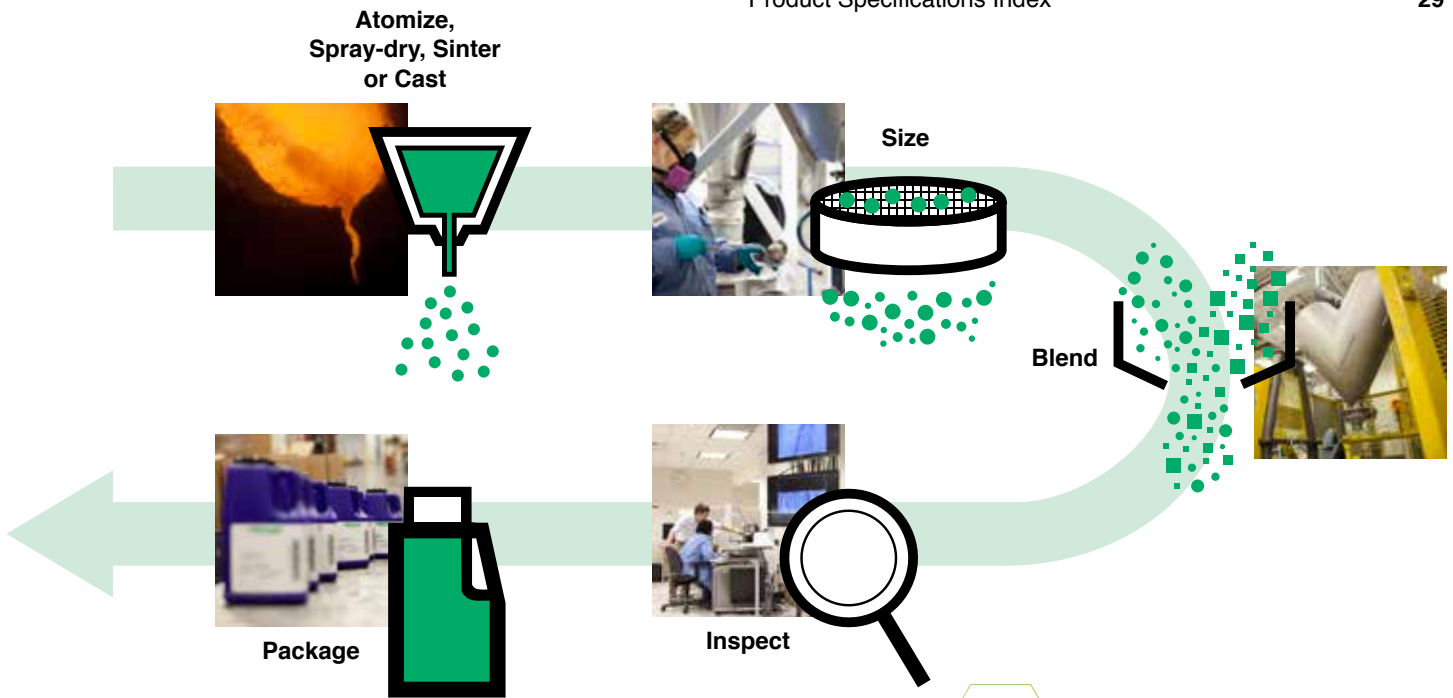
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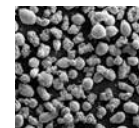
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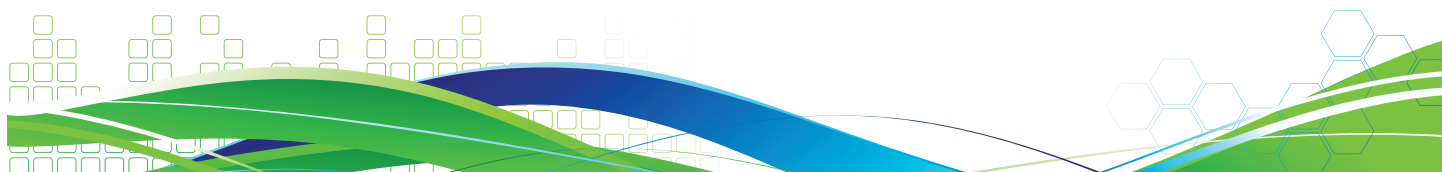


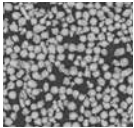
## ALUMINUM-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Al 99.0 min	AL-104	53 sec / 1.4 g/cc	-170 / +325 mesh (-90 / +45 $\mu\text{m}$ )	B50TF57 CLA PWA 1320 MSV-059	<ul style="list-style-type: none"> <li>Atomized, pure Al powder</li> <li>Corrosion protection coating</li> <li>Good for repair of Al- and Mg-based parts</li> <li>Very dense coating</li> <li>Good for electrical conductivity</li> </ul>
Si 12.0 Al balance	AL-102	46 sec / 1.4 g/cc	-170 / +325 mesh (-90 / +45 $\mu\text{m}$ )	PM 819-35 DMR 33.027 PWA 1335 CPW 235 EMS 57742 B50TF92 CLA	<ul style="list-style-type: none"> <li>Atomized Al12Si</li> <li>Good for repair of Al- and Mg-based parts</li> <li>Harder and denser than pure Al</li> <li>Turbine engine abradable-gas path seal coating</li> <li>Makes bright, smooth, shiny finishes</li> </ul>
Proprietary	AL-123		Proprietary	EMS 56729 PMI-1311	<ul style="list-style-type: none"> <li>Sintered AEP-32</li> <li>Proprietary Rolls-Royce Allison electrophoretic material</li> </ul>
Proprietary	AL-131		Proprietary	EMS 56728 PMI-1350	<ul style="list-style-type: none"> <li>Sintered AEP-100</li> <li>Proprietary Rolls-Royce Allison electrophoretic material</li> </ul>
Polyester 40.0 Si 7.2 Al balance	AL-228	--- / 0.76 g/cc	-120 m / +11 $\mu\text{m}$ (-125 / +11 $\mu\text{m}$ )	CPW 517 EMS 57735 B50TF222 CLA and CLC PWA 1349M DMR 33.087	<ul style="list-style-type: none"> <li>Al12Si / 40 Polyester blend</li> <li>High-quality abradable material</li> <li>Useable up to 617°F (325°C)</li> </ul>
Polyester 40.0 Si 7.2 Al balance	AL-229	--- / 0.79 g/cc	-100 m / +11 $\mu\text{m}$ (-150 / +11 $\mu\text{m}$ )	CPW 517	<ul style="list-style-type: none"> <li>Al12Si / 40 Polyester blend</li> <li>High-quality abradable material</li> <li>Useable up to 617°F (325°C)</li> </ul>

## COBALT-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 19.0 Ni 17.0 Si 8.0 W 4.0 Co balance	CO-216	16 sec / 4.6 g/cc	-140 mesh (-106 $\mu\text{m}$ )	AMS 4783 MS 1112	<ul style="list-style-type: none"> <li>Atomized CoCrNiSiW alloy</li> <li>Designed for brazing of superalloys</li> <li>Advantages included high-temperature strength and oxidation resistance</li> </ul>
	CO-216-4	--- / 4.3 g/cc	-325 mesh (-45 $\mu\text{m}$ )	PWA 1186	
Cr 20.0 W 15.0 Ni 10.0 Mn 1.5 Co balance	CO-308-4	14 sec / 5.0 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	B50A919	<ul style="list-style-type: none"> <li>Atomized, similar to L-605</li> <li>Excellent high-temperature strength</li> <li>Useable up to 1795°F (980°C)</li> <li>Good oxidation resistance</li> </ul>





CO-105

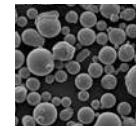
## Pure Metal and Metal Alloy Powders

### COBALT-BASED POWDERS (CONTINUED)

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 20.0 Ni 15.0 W 9.0 Al 4.5 Ta 3.0 Hf 1.0 Co balance	CO-261	---	-80 / +325 mesh (-180 / +45 $\mu\text{m}$ )	PWA 795 B-72	<ul style="list-style-type: none"> <li>Atomized CoCrNiWAlTaHf alloy</li> </ul>
Cr 22.0 Ni 22.0 W 14.5 Si 0.35 Co balance	CO-273-4	---	-80 / +325 mesh (-180 / +45 $\mu\text{m}$ )	B-17	<ul style="list-style-type: none"> <li>Atomized CoCrNiWSi alloy</li> </ul>
	CO-273-6	---	-100 / +325 mesh (-150 / +45 $\mu\text{m}$ )	B50TF255 CLB	
Cr 23.4 Ni 10.0 W 7.0 Ta 3.5 Co balance	CO-222	--- / 8.7 g/cc	-325 mesh (-45 $\mu\text{m}$ )	PWA 1185-2 B-60 B50TF304 CLA MS1068 B50A988 CLB	<ul style="list-style-type: none"> <li>Atomized, similar to MAR-M-509</li> <li>Used primarily in repair applications</li> </ul>
	CO-222-3	15 sec / 4.8 g/cc	-140 / +325 mesh (-106 / +45 $\mu\text{m}$ )	---	
Cr 25.5 Ni 10.5 W 7.5 C 0.5 Co balance	CO-103	neg. / 4.0 g/cc	-325 m / +5 $\mu\text{m}$ (-45 / +5 $\mu\text{m}$ )	PM 819-16 JA 1316 CPW 236 EMS 52432XXIII DMR 33.008 MSRR 9507/23	<ul style="list-style-type: none"> <li>Atomized, similar to Co Alloy 31 and X40</li> <li>Excellent oxidation resistance</li> <li>Replaces WC in high-temperature applications</li> <li>Smooth as-sprayed coating</li> <li>Suited for repair of Co-based parts</li> </ul>
	CO-103-3	---	-325 mesh (-45 $\mu\text{m}$ )	---	
Cr 25.5 Ni 10.5 W 7.5 C 0.5 Co balance	CO-105 / CO-285-2	17 sec / 4.0 g/cc	-200 / +325 mesh (-75 / +45 $\mu\text{m}$ )	PWA 1318 MSRR 9507/3 BMS 10-67 Type IX AMS 5791 CPW 218 B50TF185 CLA DMR 33.007	<ul style="list-style-type: none"> <li>Atomized, similar to Co Alloy 31 and X40</li> <li>Excellent oxidation resistance</li> <li>Replaces WC in high-temperature applications</li> <li>Smooth as-sprayed coating</li> <li>Suited for repair of Co-based parts</li> </ul>
	CO-285	17 sec / 4.0 g/cc	-140 / +325 mesh (-106 / +45 $\mu\text{m}$ )	B50TF185 CLA DMR 35.351 CL2 MS 1087	
	CO-285-12 / 1245F	15 sec / 4.2 g/cc	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	
Cr 26.0 Al 10.5 Hf 2.75 Co balance	CO-174	--- / 3.9 g/cc	-325 mesh (-45 $\mu\text{m}$ )	B50TF201 CLB CD 1122	<ul style="list-style-type: none"> <li>Atomized CoCrAlHf alloy</li> </ul>
	CO-174-4	---	(-16 $\mu\text{m}$ )	D-13	



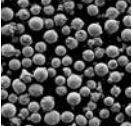




## COBALT-BASED POWDERS (CONTINUED)

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 28.0 W 4.0 C 1.0	CO-106-1	15 sec / 4.4 g/cc	-325 m / +11 $\mu\text{m}$ (-45 / +11 $\mu\text{m}$ )	B50A960	<ul style="list-style-type: none"> <li>Atomized, similar to Co Alloy 6</li> <li>Excellent wear properties</li> <li>Produces hard, dense coatings</li> <li>High-temperature wear and corrosion properties</li> </ul>
Si 1.0 Co balance	CO-106-8 / 1256F	14 sec / 4.5 g/cc	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	
Cr 28.0 W 19.5 Ni 5.0 V 1.0 Co balance	CO-114-2	13 sec / 4.7 g/cc	-200 / +325 mesh (-75 / +45 $\mu\text{m}$ )	B50A842 PWA 1314	<ul style="list-style-type: none"> <li>Atomized, similar to CM-64</li> <li>Excellent high-temperature wear and oxidation properties</li> <li>Serviceable up to 1350°F (732°C)</li> <li>Hard, dense coating suitable for repair of Co-based parts</li> </ul>
	CO-114-13	---	-100 / +325 mesh (-150 / +45 $\mu\text{m}$ )	---	
Cr 28.3 Ni 10.0 W 7.0 Ta 3.5 B 2.8 Co balance	CO-333	--- / 4.2 g/cc	-325 m / +11 $\mu\text{m}$ (-45 / +11 $\mu\text{m}$ )	B50TF305 CLA B50A989 CLB B-59 MS 1120	<ul style="list-style-type: none"> <li>Atomized, similar to MAR-M-509+B</li> <li>Low melt temperature version of CO-222</li> <li>Used in brazing applications</li> </ul>
	CO-333-7	16 sec / 4.6 g/cc	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	---	
Cr 29.5 Ni 10.5 W 7.0 Si 0.8 Co balance	CO-263-3	16 sec / 4.4 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	B50A489	<ul style="list-style-type: none"> <li>Atomized, similar to FSX-414</li> <li>Good oxidation resistance</li> <li>Superalloy, used in aerospace applications</li> </ul>
Mo 28.5 Cr 8.5 Si 2.6 Co balance	CO-109	20 sec / 3.2 g/cc	-325 mesh (-45 $\mu\text{m}$ )	B50TF155 CLA EMS 52432 XVI BMS 10-67 Type XV B50A918	<ul style="list-style-type: none"> <li>Atomized, similar to Tribaloy 400®</li> <li>Intermetallic Laves phases provide excellent wear properties from room temperature to 1500°F (816°C)</li> <li>Good hot hardness, oxidation and corrosion properties</li> <li>Low coefficient of friction</li> </ul>
	CO-109-3	---	-400 m / +16 $\mu\text{m}$ (-38 / +16 $\mu\text{m}$ )	---	
	CO-109-7	15 sec / 4.6 g/cc	-325 m / +22 $\mu\text{m}$ (-45 / +22 $\mu\text{m}$ )	B50TF155 CLA EMS 52432 XVI CTS 1025	
Mo 28.5 Cr 17.5 Si 3.4 Co balance	CO-111	19 sec / 4.5 g/cc	-325 m / +11 $\mu\text{m}$ (-45 / +11 $\mu\text{m}$ )	B50TF190 CLA EMS 52432 XV PM 819-15 JA 13003	<ul style="list-style-type: none"> <li>Atomized, similar to Tribaloy 800®</li> <li>Intermetallic Laves phases provide excellent wear properties from room temperature to 1500°F (816°C)</li> <li>Good hot hardness, oxidation and corrosion properties</li> <li>Low coefficient of friction</li> </ul>
	CO-111-10	--- / 4.3 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	





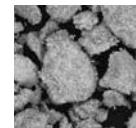
CU-102

## Pure Metal and Metal Alloy Powders

### COPPER-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cu 99.0	CU-159-3	---	-400 m / +11 $\mu$ m (-38 / +11 $\mu$ m)	---	• Atomized, pure Cu
	CU-159	---	(-31 / +5 $\mu$ m)	---	
	CU-159-1	---	-200 / +325 mesh (-75 / +45 $\mu$ m)	---	
Al 10.0 Fe 1.0 Cu balance	CU-104	20 sec / 3.6 g/cc	-270 m / +5 $\mu$ m (-53 / +5 $\mu$ m)	PWA 1378-2 BMS 10-67K Type II B50TF161 CLB TK 2053-2	• Atomized Al-Bronze alloy • Good bearing material • Resistant to fretting and galling at low temperatures • Easily machined coating
	CU-104-2	20 sec / 3.6 g/cc	-270 m / +11 $\mu$ m (-53 / +11 $\mu$ m)	PWA 1378-1 CPW 617-1 B50TF161 CLB TK 2035-1 TK 2003	
	CU-104-5	19 sec / 3.9 g/cc	-120 / +325 mesh (-125 / +45 $\mu$ m)	B550TF161 CLA	
Ni 38.0 Cu balance	CU-103	16 sec / 4.4 g/cc	-200 / +325 mesh (-75 / +45 $\mu$ m)	DMR 33.015 PWA 1369 PM 819-42 B50TF42 CLA	• Atomized CuNi alloy • Protects against fretting and galling • Dense coatings with low porosity and oxide content
	CU-116	---	-325 mesh (-45 $\mu$ m)	---	
Ni 36.5 In 5.0 Cu balance	CU-101	21 sec / 4.3 g/cc	-325 m / +5 $\mu$ m (-45 / +5 $\mu$ m)	BMS 10-67K Type XIV B50TF72 CLB	• Atomized CuNiIn alloy • Excellent anti-fretting coating
	CU-102	15 sec / 4.3 g/cc	-200 / +325 mesh (-75 / +45 $\mu$ m)	B50TF72 CLA MSRR 9507/31 BMS 10-67K Type XIV DMR 33.016 CP 6003	• Dense coatings with low porosity and oxide content





## IRON-BASED POWDERS

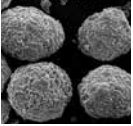
Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 12.5 Fe balance	FE-108-3	20 sec / 2.9 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Atomized FeCr alloy, 420SS</li> <li>Useful below 1200°F (649°C)</li> <li>Good against fretting, cavitation and erosion</li> <li>Excellent corrosion properties</li> </ul>
Cr 13.0 C 0.4 Fe balance	FE-211-5 / 1234F	20 sec / 3.0 g/cc	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Atomized FeCr alloy, 420SS</li> <li>Moderately hard coating</li> <li>Useful below 1200°F (649°C)</li> <li>Good against fretting, cavitation and erosion</li> <li>Excellent wear and corrosion resistance</li> </ul>
Cr 17.0 Ni 12.0 Mo 2.5 Fe balance	FE-101	28 sec / 2.9 g/cc	-325 mesh (-45 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Atomized 316SS</li> <li>Excellent corrosion properties</li> <li>Smooth coating that is easily machined</li> <li>Good against fretting, cavitation and erosion</li> <li>Good for dimensional repair and build-up</li> </ul>
	FE-271 / 1236F	22 sec / 2.9 g/cc	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	
	FE-271-4	---	-140 / +325 mesh (-106 / +45 $\mu\text{m}$ )	---	
Ni 18.0 Co 9.0 Mo 5.0 Fe balance	FE-328-1	---	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Atomized FeNiCoMo alloy</li> </ul>

## MOLYBDENUM-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Mo 99.5 min	MO-102	15 sec / 5.7 g/cc	-170 / +325 mesh (-90 / +45 $\mu\text{m}$ )	PM 819-13 PWA 1313 EMS 56705 MSV-048 CPW 213	<ul style="list-style-type: none"> <li>Plasma densified, pure Mo</li> <li>Self-bonding to most metallic surfaces</li> <li>Natural lubricity and high hardness</li> <li>Good wear properties</li> <li>Useful up to 600°F (316°C)</li> </ul>
Mo 99.5 min	MO-130	neg. / 1.7 g/cc	(-22 $\mu\text{m}$ )	PWA 1338	<ul style="list-style-type: none"> <li>Agglomerated, pure Mo</li> <li>Self-bonding to most metallic surfaces</li> <li>Natural lubricity and high hardness</li> <li>Good wear properties</li> <li>Useful up to 600°F (316°C)</li> </ul>
	MO-130-1	27 sec / 2.6 g/cc	-200 / +325 mesh (-75 / +45 $\mu\text{m}$ )	---	
	MO-130-2 / 1193F	--- / 5.7 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	MSV-058	
Ni 18.3 Cr 3.5 Fe 1.0 Si 1.0 Mo balance	AI-1054	--- / 2.6 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Agglomerated Mo / Atomized NiCrSiFeB blend</li> <li>Coating structure promotes oil retention</li> <li>High wear resistance</li> <li>Low coefficient of friction</li> </ul>







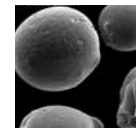
NI-109

## Pure Metal and Metal Alloy Powders

### NICKEL-BASED POWDERS

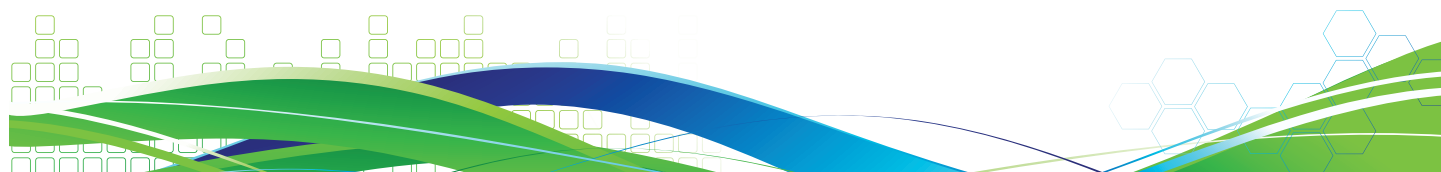
Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Ni 99.00 min	NI-101	neg. / 3.3 g/cc	-325 m / +11 $\mu\text{m}$ (-45 / +11 $\mu\text{m}$ )	B50TF17 CLA/B	<ul style="list-style-type: none"> <li>Water-atomized, pure Ni</li> <li>Coatings are dense and moderately hard</li> <li>Good corrosion and oxidation properties</li> <li>Good for repair of Ni-based and SS parts</li> <li>Can be used for a ceramic bond coat</li> <li>Easily machined</li> <li>Useful up to 1000°F (538°C)</li> </ul>
	NI-969	25 sec / 3.3 g/cc	-200 / +325 mesh (-75 / +45 $\mu\text{m}$ )	---	
Ni 99.00 min	NI-914-3	20 sec / 4.3 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Gas-atomized, pure Ni</li> <li>Coatings are dense and moderately hard</li> <li>Good corrosion and oxidation properties</li> <li>Good for repair of Ni-based and SS parts</li> <li>Can be used for a ceramic bond coat</li> <li>Easily machined</li> <li>Useful up to 1000°F (538°C)</li> </ul>
Al 4.75 Ni balance	NI-357-1	---	-325 m / +11 $\mu\text{m}$ (-45 / +11 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Gas-atomized NiAl powder</li> <li>Properties similar to NI-185</li> <li>Superior deposition efficiency</li> <li>Smoke-free spray-ability</li> </ul>
	NI-357-6	---	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	
Al 5.0 Ni balance	NI-109	16 sec / 3.9 g/cc	-170 / +325 mesh (-90 / +45 $\mu\text{m}$ )	B50TF56 CLA PM 819-37 EMS 57746 Type 1 CLII C-94 EMS 56757 CPW 247 PWA 1337 DMR 33.011	<ul style="list-style-type: none"> <li>Composite NiAl powder</li> <li>Properties similar to NI-185</li> <li>Self-bonds to most metallic surfaces</li> </ul>
Al 5.0 Ni balance	NI-185	25 sec / 3.1 g/cc	-170 / +325 mesh (-90 / +45 $\mu\text{m}$ )	B50TF56 CLB GE 200-002030 PWA 1380 EMS 57746 Type 1 CLI PM 819-56 DMR 33.011 CPW 490 BMS 10-67	<ul style="list-style-type: none"> <li>Water-atomized NiAl powder</li> <li>Good oxidation and corrosion properties</li> <li>Can be used for a ceramic bond coat</li> <li>Good for general repair and build-up</li> <li>Thick coatings are possible</li> <li>Easily machined</li> </ul>
Al 5.1 Ni balance	NI-970	22 sec / 3.3 g/cc	-170 / +325 mesh (-90 / +45 $\mu\text{m}$ )	PWA 1337 C-94 B50TF56 CLA	<ul style="list-style-type: none"> <li>Clad NiAl powder</li> <li>Properties similar to NI-185</li> <li>Superior deposition efficiency</li> <li>Smoke-free spray-ability</li> </ul>
C 15.0 Ni balance	NI-115	33 sec / 2.3 g/cc	-100 mesh (-150 $\mu\text{m}$ )	B50TF53 CLB	<ul style="list-style-type: none"> <li>Clad Ni-15 Graphite</li> <li>Coatings are lubricious and suited for friction applications</li> <li>Flame spraying offers good abrasability</li> <li>Sacrificial coatings good for clearance control</li> <li>Useful up to 900°F (482°C)</li> <li>Better erosion resistance than 75/25</li> </ul>

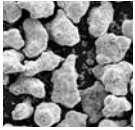




## NICKEL-BASED POWDERS (CONTINUED)

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 25.0 Ni balance	NI-114	43 sec / 1.8 g/cc	-170 mesh (-90 $\mu\text{m}$ )	PWA 1352	<ul style="list-style-type: none"> <li>Clad Ni-25 Graphite</li> <li>Coatings are lubricious and suited for friction applications</li> <li>Flame spraying offers good abrasability</li> <li>Sacrificial coatings good for clearance control</li> <li>Useful up to 900°F (482°C)</li> </ul>
Cr 7.0 Si 4.2 Fe 3.0 B 3.0 Ni balance	NI-362-3	---	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	AMS 4777 MS1063 B50TF204 CLA	<ul style="list-style-type: none"> <li>Atomized NiCrSiFeB alloy</li> <li>Similar to Ni-167 but permits brazing at much lower temperature</li> <li>Excellent flow characteristics without intergranular attack (IGA) or other base dilutions</li> <li>Ideal choice for joining thin sections such as heat exchanger or honeycomb components</li> </ul>
Cr 9.75 Al 7.2 Fe 4.5 Mo 2.0 Ni balance	NI-630	16 sec / 3.9 g/cc	-100 / +325 mesh (-150 / +45 $\mu\text{m}$ )	EMS 56762	<ul style="list-style-type: none"> <li>Composite NiCrAlFeMo powder</li> <li>Machineable stainless steel type coating</li> <li>Self-bonds to most metallic surfaces</li> <li>Good oxidation and corrosion properties</li> <li>Good for general repair and build-up</li> <li>Thick coatings are possible</li> <li>Useful up to 1600°F (871°C)</li> </ul>
Cr 14.0 Co 9.5 Ti 5.0 Mo 4.0 W 4.0 Al 3.0 Ni balance	NI-183	16 sec / 4.2 g/cc	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	B50TF183 CLA/B MS 1086 C-74 CD 1146	<ul style="list-style-type: none"> <li>Atomized, similar to Rene 80</li> <li>Good for repair and build-up of similar chemistry superalloy components</li> </ul>
	NI-183-1	--- / 4.1 g/cc	-325 mesh (-45 $\mu\text{m}$ )	MS 1158	
	NI-183-4	---	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	B50TF183 CLC	
Cr 14.0 Co 9.5 Ti 4.8 Si 4.6 Mo 4.0 W 3.8 Al 3.0 Ni balance	NI-332	---	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	B50TF108 CLA GE 4096601-424 GE 4013287-793	<ul style="list-style-type: none"> <li>Atomized NiCrCoTiSiMoWAl alloy</li> </ul>
Cr 14.5 Fe 4.5 Si 4.5 B 3.25 C 0.75 Ni balance	NI-167	16 sec / 4.2 g/cc	-140 / +325 mesh (-106 / +45 $\mu\text{m}$ )	AMS 4775	<ul style="list-style-type: none"> <li>Atomized NiCrSiFeB alloy</li> <li>Self-fluxing type alloy</li> <li>Good corrosion and wear properties</li> </ul>
	NI-167-6	16 sec / 4.1 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>May be blended with a carbide and applied via spray/fuse process</li> </ul>
	NI-167-11	---	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Serviceable up to 1500°F (816°C)</li> </ul>





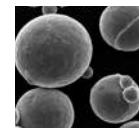
NI-122

## Pure Metal and Metal Alloy Powders

### NICKEL-BASED POWDERS (CONTINUED)

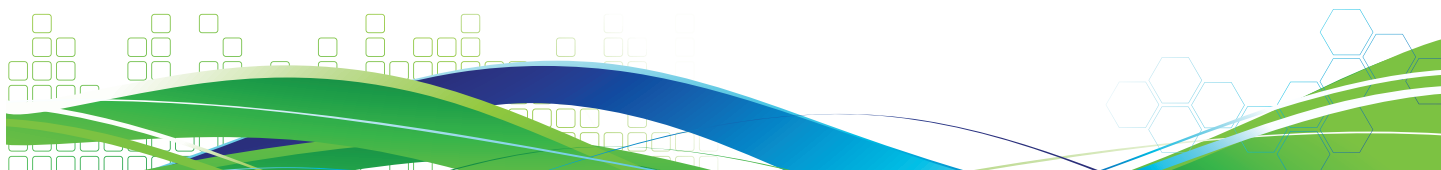
Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 16.5 Fe 4.5 Si 4.2 B 3.1 C 0.8 Ni balance	NI-1024 / 1275H	16 sec / 4.3 g/cc	-230 m / +22 $\mu$ m (-63 / +22 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Atomized NiCrSiFeB alloy</li> <li>Self-fluxing type alloy</li> <li>Good corrosion and wear properties</li> <li>May be blended with a carbide and applied via spray/fuse process</li> <li>Serviceable up to 1500°F (816°C)</li> </ul>
Cr 18.0 Al 6.0 Ni balance	NI-528	---	-325 m / +11 $\mu$ m (-45 / +11 $\mu$ m)	B50TF119 CLC	<ul style="list-style-type: none"> <li>Atomized NiCrAl powder</li> <li>Good oxidation and corrosion properties</li> <li>Good for general repair and build-up</li> <li>Thick coatings are possible</li> <li>Smoke-free spray-ability</li> </ul>
Cr 18.0 Al 6.0 Si 1.0 Ni balance	NI-122	20 sec / 3.3 g/cc	-120 / +325 mesh (-125 / +45 $\mu$ m)	PWA 1347 ES 9-327 EMS 57748 Type 1 CLII GE 210-000850 PM 819-47 B50TF119 CLA	<ul style="list-style-type: none"> <li>Composite NiCrAl powder</li> <li>Self-bonds to most metallic surfaces</li> <li>Good oxidation and corrosion properties</li> <li>Good for general repair and build-up</li> <li>Thick coatings are possible</li> </ul>
Cr 19.0 Si 10.0 Ni balance	NI-430	16 sec / 4.2 g/cc	-120 / +325 mesh (-125 / +45 $\mu$ m)	B50A935 CLA B50TF142 CLA AMS 4782 B50TF81 CLA	<ul style="list-style-type: none"> <li>Atomized NiCrSi alloy</li> <li>Provides strong, tough joints with excellent high-temperature performance</li> <li>Recommended for nuclear applications or those where boron cannot be tolerated</li> </ul>
Cr 19.0 Fe 18.0 Nb+Ta 5.1 Mo 3.0 Ti 1.0 Ni balance	NI-202	16 sec / 4.3 g/cc	-120 / +325 mesh (-125 / +45 $\mu$ m)	B50TF202 CLA MS 1088	<ul style="list-style-type: none"> <li>Atomized, similar to Alloy 718</li> <li>Excellent high-temperature oxidation and corrosion properties</li> </ul>
	NI-202-1	16 sec / 4.1 g/cc	-170 / +325 mesh (-90 / +45 $\mu$ m)	B50TF202 CLB PWA PMC 5127-1 PM 819-59 CP 6025	<ul style="list-style-type: none"> <li>Good for repair and build-up of similar chemistry superalloy components</li> <li>Useful up to 1800°F (982°C)</li> </ul>
	NI-202-2	19 sec / 4.3 g/cc	-325 m / +11 $\mu$ m (-45 / +11 $\mu$ m)	---	
	NI-202-3 / 1278F	19 sec / 4.1 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	PM 819-65 B50TF202 CLD	
	NI-202-23	---	(-22 $\mu$ m)	---	
Proprietary (GE)	NI-256		Proprietary	B50TF242 CLA CD 1283	<ul style="list-style-type: none"> <li>Atomized, proprietary superalloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> </ul>
	NI-256-1		Proprietary	B50TF242 CLB CD 1284	
	NI-256-2		Proprietary	B50TF242 CLC	
	NI-256-7		Proprietary	B50TF242 CLD	

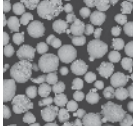




## NICKEL-BASED POWDERS (CONTINUED)

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 20.0 Ni balance	NI-105	neg. / 3.7 g/cc	-325 m / +5 $\mu\text{m}$ (-45 / +5 $\mu\text{m}$ )	PWA 1319	<ul style="list-style-type: none"> <li>• Atomized NiCr alloy</li> <li>• Good corrosion and oxidation properties</li> <li>• Produces bright and smooth coatings</li> <li>• Exhibits good bonding characteristics</li> <li>• Resists oxidation and corrosive gases up to 1800°F (982°C)</li> <li>• Suitable as a ceramic bond coat</li> <li>• Good for general repair and build-up</li> </ul>
	NI-105-7 / 1262F	15 sec / 4.4 g/cc	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	
	NI-106	22 sec / 3.4 g/cc	-230 m / +11 $\mu\text{m}$ (-63 / +11 $\mu\text{m}$ )	JA 1317 MSRR 9507/27 PWA 1317 B50TF40 CLB	
	NI-107	16 sec / 4.3 g/cc	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	JA 1315 B50TF40 CLA C-83 PWA 1315 MSRR 9507/8	
Cr 21.5 Mo 9.0 Nb+Ta 3.7 Ni balance	NI-328	24 sec / 3.9 g/cc	-325 m / +11 $\mu\text{m}$ (-45 / +11 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>• Atomized, similar to Alloy 625</li> <li>• Excellent high-temperature oxidation and corrosion properties</li> <li>• Good for repair and build-up of similar chemistry superalloy components</li> <li>• Useful up to 1800°F (982°C)</li> </ul>
	NI-328-1	16 sec / 4.3 g/cc	-170 / +325 mesh (-90 / +45 $\mu\text{m}$ )	ST 1627	
	NI-328-5 / 1265F	15 sec / 4.4 g/cc	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	
Cr 46.0 Fe 1.0 Ni balance	NI-980-1 / 1260F	17 sec / 4.3 g/cc	-270 m / +22 $\mu\text{m}$ (-53 / +22 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>• Atomized NiCr alloy</li> <li>• Coatings are resistant to corrosive gases (V and S)</li> <li>• Good boiler coating material</li> </ul>
	NI-980-4	17 sec / 4.0 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	
Mo 16.5 Cr 15.8 Fe 5.5 W 4.0 Ni balance	NI-544-6 / 1269F	14 sec / 4.5 g/cc	-230 m / +22 $\mu\text{m}$ (-63 / +22 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>• Atomized, similar to Alloy C/C 276</li> <li>• Excellent high-temperature oxidation and corrosion properties</li> <li>• Good for repair and build-up of similar chemistry superalloy components</li> </ul>
	NI-544-1	---	-100 / +325 mesh (-150 / +45 $\mu\text{m}$ )	---	
W 16.5 Cr 15.5 Si 4.0 Fe 3.5 B 2.9 Ni balance	1276F	16 sec / 4.5 g/cc	-230 m / +16 $\mu\text{m}$ (-63 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>• Atomized NiWCrSiB alloy</li> <li>• Hard, machineable coating, as-sprayed or fused</li> <li>• Resists abrasion and erosion at high temperatures</li> </ul>





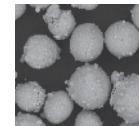
CO-210-1

## MCrAlY Powders

### COBALT-BASED MCrAlY POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 28.0 Al 9.0 Y 0.35 Co balance	CO-187	---	-325 m / +5 $\mu\text{m}$ (-45 / +5 $\mu\text{m}$ )	EPS 7100	<ul style="list-style-type: none"> <li>Atomized CoCrAlY alloy</li> </ul>
Cr 30.0 Al 8.0 Y 0.35 Co balance	CO-267	---	-325 m / +5 $\mu\text{m}$ (-45 / +5 $\mu\text{m}$ )	SML-151	<ul style="list-style-type: none"> <li>Atomized CoCrAlY alloy</li> </ul>
Cr 23.0 Al 13.0 Y 0.65 Co balance	CO-110	--- / 3.7 g/cc	-325 m / +5 $\mu\text{m}$ (-45 / +5 $\mu\text{m}$ )	PWA 1348-2	<ul style="list-style-type: none"> <li>Atomized CoCrAlY alloy</li> </ul>
	CO-110-1	17 sec / 3.8 g/cc	-140 m / +31 $\mu\text{m}$ (-106 / +31 $\mu\text{m}$ )	PWA 1348-3	
Ni 32.0 Cr 21.0 Al 8.0 Y 0.5 Co balance	CO-127	18 sec / 3.6 g/cc	-325 m / +5 $\mu\text{m}$ (-45 / +5 $\mu\text{m}$ )	CPW 528-1	<ul style="list-style-type: none"> <li>Atomized CoNiCrAlY alloys</li> <li>Excellent corrosion and oxidation properties up to 1900°F (1038°C)</li> <li>Heat treating is required for optimum performance</li> <li>Typically used for either a TBC bondcoat or an environmental protection coating</li> <li>GT-20</li> </ul>
	CO-159	18 sec / 3.6 g/cc	-200 m / +16 $\mu\text{m}$ (-75 / +16 $\mu\text{m}$ )	CPW 528-2	
	CO-210-1	18 sec / 3.5 g/cc	-325 m / +11 $\mu\text{m}$ (-45 / +11 $\mu\text{m}$ )	B50TF195 CLA B50AG5 CLB EMS 57741 CD 1147 MSRR 9507-86	
	CO-210-24/ CO-241-3	17 sec / 3.7 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	CPW 528-3 CD 1184 JA 13004 EMS 39664 CLII	
	CO-210-6	---	(-22 $\mu\text{m}$ )	B50TF318 CLA	
	CO-211	19 sec / 3.5 g/cc	-170 / +400 mesh (-90 / +38 $\mu\text{m}$ )	PM 819-58 CD 1291 EMS 57741 CLA C-65 MSRR 9507/47 EMS 39664 CLI	
	CO-211-1	--- / 3.8 g/cc	-400 m / +5 $\mu\text{m}$ (-38 / +5 $\mu\text{m}$ )	C-35 MSRR 9507/73	
	CO-211-3	20 sec / 3.7 g/cc	-100 / +230 mesh (-150 / +63 $\mu\text{m}$ )	MSRR 9507/57	
	CO-241	18 sec / 3.6 g/cc	-325 mesh (-45 $\mu\text{m}$ )	B50AG20 CLA	





## COBALT-BASED MCRAIY POWDERS (CONTINUED)

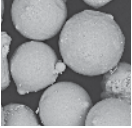
Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Proprietary (GE)	CO-242		Proprietary	B50AG2	<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> <li>GT-29</li> </ul>
	CO-242-3		Proprietary	B50AG11	
Proprietary (GE)	CO-249		Proprietary		<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> <li>GT-33</li> </ul>
	CO-249-2		Proprietary		
	CO-249-4		Proprietary		
	CO-249-6		Proprietary	B50AG12 CLA	
	CO-249-8		Proprietary	B50AG6 CLB	
	CO-249-14		Proprietary	B50AG12 CLB	
Proprietary (Solar Turbines)	CO-260-1		Proprietary	ES9-362 Type A	<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> </ul>
	CO-260-12		Proprietary	ES9-362 Type B	
Proprietary (Siemens)	CO-301		Proprietary	C-58 TLV511114001	<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> <li>SICOAT 2231</li> </ul>
	CO-301-3		Proprietary	TLV511114000	
	CO-301-8		Proprietary	TLV511114001	
	CO-301-4		Proprietary	EKS-L-VB 182	

## NICKEL-BASED MCRAIY POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr 22.0 Al 10.0 Y 1.0 Ni balance	NI-164 / NI-211	20 sec / 3.6 g/cc	-140 / +325 mesh (-106 / +45 μm)	B50TF192 CLA B50A892 PM 819-44 DMR 33.090 WIMS 645 CLB 10042379 B50TF162 CLA	<ul style="list-style-type: none"> <li>Atomized NiCrAlY alloys</li> <li>Good diffusional stability and oxidation properties</li> <li>Useful up to 1800°F (982°C)</li> <li>Typically used for a TBC bondcoat</li> </ul>
	NI-164-2	17 sec / 3.8 g/cc	-200 / +325 mesh (-75 / +45 μm)	EMS 57737 Type II ES 9-455	
	NI-211-2	20 sec / 3.7 g/cc	-170 / +325 mesh (-90 / +45 μm)	B50AG16 CLA	
	NI-211-4	17 sec / 3.7 g/cc	-270 m / +22 μm (-63 / +22 μm)	B50AG16 CLB	
	NI-211-7	21 sec / 3.6 g/cc	-120 / +270 mesh (-125 / +53 μm)	B50AG16 CLE	





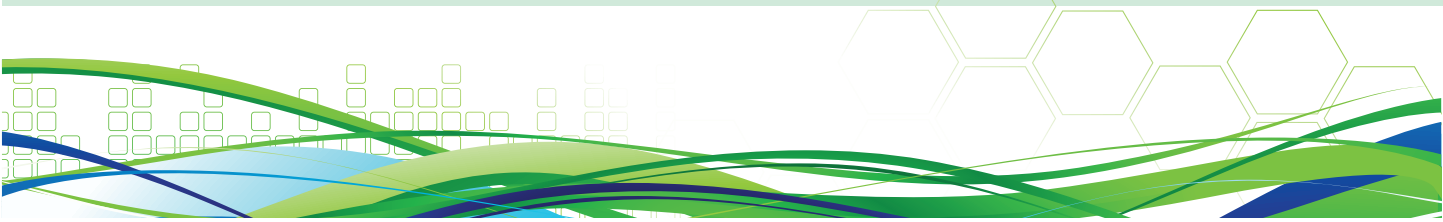


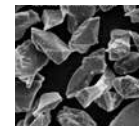
NI-171

## MCrAlY Powders

### NICKEL-BASED MCrAlY POWDERS (CONTINUED)

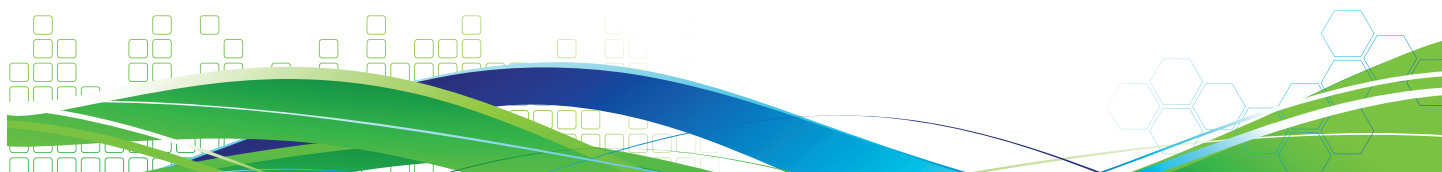
Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
	NI-211-17	17 sec / 3.7 g/cc	-80 m / +22 $\mu$ m (-180 / +22 $\mu$ m)	B50AG16 CLD	
	NI-343	neg. / 3.8 g/cc	-325 m / +11 $\mu$ m (-45 / +11 $\mu$ m)	---	
Co 22.0 Cr 17.0 Al 12.5 Y 0.55 Ni balance	NI-130 / NI-191	neg. / 3.6 g/cc	-325 mesh (-45 $\mu$ m)	SML-150 PWA 1376 C-73	<ul style="list-style-type: none"> <li>Atomized NiCrAlY alloy</li> <li>High-temperature operation conditions</li> <li>Oxidation and hot corrosion resistance</li> </ul>
	NI-171	19 sec / 3.7 g/cc	-200 / +325 mesh (-75 / +45 $\mu$ m)	SML-149 CPW 387 PM 819-51 PWA 1365-2	
	NI-171-2	---	-325 m / +22 $\mu$ m (-45 / +22 $\mu$ m)	---	
	NI-191-4	18 sec / 3.5 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	---	
Cr 31.0 Al 11.25 Y 0.65 Ni balance	NI-246-3	35 sec / 3.8 g/cc	-400 m / +11 $\mu$ m (-38 / +11 $\mu$ m)	C-60	<ul style="list-style-type: none"> <li>Atomized NiCrAlY alloys</li> <li>Good diffusional stability and oxidation properties</li> </ul>
	NI-246-4	17 sec / 3.7 g/cc	-170 / +400 mesh (-90 / +38 $\mu$ m)	PM 819-29 EMS 57737 Type I C-59	<ul style="list-style-type: none"> <li>Useful up to 1800°F (982°C)</li> <li>Typically used for a TBC bondcoat</li> </ul>
Proprietary (Pratt Whitney)	NI-192		Proprietary	CD 1115 PWA 1386-1	<ul style="list-style-type: none"> <li>Atomized NiCoCrAlYSiHf</li> <li>Similar to the NI-130 / NI-191 alloy with addition of Hf and Si</li> </ul>
	NI-192-5		Proprietary	C-77	<ul style="list-style-type: none"> <li>High-temperature operation conditions</li> <li>Oxidation and hot corrosion resistance</li> </ul>
	NI-192-8		Proprietary	CD 1297 PWA 1386-2 CPW 602-2	
	NI-192-16		Proprietary	---	
Proprietary (Alstom)	NI-535		Proprietary	HTCT 650557	<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> </ul>
	NI-535-2		Proprietary	C-92 HTCT 650565	<ul style="list-style-type: none"> <li>Product data available through OEM</li> <li>SV-20</li> </ul>
	NI-535-3		Proprietary	C-91 HTCT 650557	
	NI-535-4		Proprietary	HTCT 650557	
Proprietary (Alstom)	NI-548-1		Proprietary	HTCT 650559	<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> </ul>
	NI-548-4		Proprietary	HTCT 650559	<ul style="list-style-type: none"> <li>Product data available through OEM</li> <li>SL-30</li> </ul>

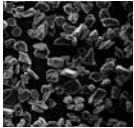




## NICKEL-BASED MCrAlY POWDERS (CONTINUED)

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Proprietary (Alstom)	NI-832		Proprietary	HTCT 650581	<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> <li>SV-349, SL-349</li> </ul>
	NI-832-2		Proprietary	C-89 HTCT 650585	
Proprietary (Siemens)	NI-937 / NI-666		Proprietary	TLV 511114001	<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> <li>SICOAT 2453</li> </ul>
	NI-937-2		Proprietary	TLV 511114001	
	NI-937-4 / NI-666-4		Proprietary	DGTL511114001 MS 2054	
Proprietary (Siemens)	NI-944		Proprietary		<ul style="list-style-type: none"> <li>Atomized, proprietary alloys</li> <li>Available to OEM-approved users only</li> <li>Product data available through OEM</li> <li>SICOAT 2464</li> </ul>
	NI-944-1		Proprietary	DGTLV511114001	
	NI-944-2		Proprietary	DGTLV511114001 C-81	
	NI-944-3		Proprietary	DGTLV511114001	





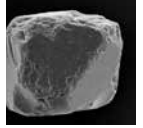
ALO-114

## Ceramic Powders

### ALUMINUM OXIDE-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Al <sub>2</sub> O <sub>3</sub> 99.5 min	AI-1010-HP	neg. / 1.39 g/cc	-325 m / +5 μm (-45 / +5 μm)	PWA 1310 MSRR 9507/9 M1020.1 CD 1280	<ul style="list-style-type: none"> <li>Fused, pure Al<sub>2</sub>O<sub>3</sub></li> </ul>
Al <sub>2</sub> O <sub>3</sub> 99.0 min	ALO-101	neg. / 1.1 g/cc	-325 mesh (-45 μm)	PWA 1310 MSV-121	<ul style="list-style-type: none"> <li>Fused, pure Al<sub>2</sub>O<sub>3</sub></li> <li>Good for abrasion, erosion, and sliding wear</li> <li>Good in alkali and acid environments</li> </ul>
Al <sub>2</sub> O <sub>3</sub> 99.3 min	AI-1110-HP	neg. / 1.4 g/cc	-325 m / +5 μm (-22 / +5 μm)	MSRR 9507/9 EMS 56773	<ul style="list-style-type: none"> <li>Excellent dielectric properties</li> <li>Useable between 1550-3000°F (843-1649°C)</li> </ul>
Al <sub>2</sub> O <sub>3</sub> 99.0 min	ALO-114	neg. / 1.28 g/cc	-325 mesh (-45 μm)	---	<ul style="list-style-type: none"> <li>Fused, pure Al<sub>2</sub>O<sub>3</sub></li> </ul>
TiO <sub>2</sub> 2.75 Al <sub>2</sub> O <sub>3</sub> balance	ALO-159	neg. / 1.6 g/cc	-140 mesh (-106 μm)	PWA 1331 PWA 1311-3S A50TF87 CLB C-95	<ul style="list-style-type: none"> <li>Fused Al<sub>2</sub>O<sub>3</sub>-3TiO<sub>2</sub></li> <li>Good in alkali and acid environments</li> <li>Requires grinding</li> <li>Good for abrasion, erosion, and sliding wear</li> </ul>
TiO <sub>2</sub> 3.0 Al <sub>2</sub> O <sub>3</sub> balance	ALO-105	neg. / 1.6 g/cc	-270 mesh (-53 μm)	A50TF87 CLA	<ul style="list-style-type: none"> <li>Fused Al<sub>2</sub>O<sub>3</sub>-3TiO<sub>2</sub></li> <li>Good in alkali and acid environments</li> <li>Requires grinding</li> </ul>
	ALO-105-1	---	(-31 / +5 μm)	A50TF87 CLC	<ul style="list-style-type: none"> <li>Good for abrasion, erosion, and sliding wear</li> </ul>
TiO <sub>2</sub> 13.0 Al <sub>2</sub> O <sub>3</sub> balance	ALO-187	neg. / 1.6 g/cc	-325 m / +11 μm (-45 / +11 μm)	---	<ul style="list-style-type: none"> <li>Fused Al<sub>2</sub>O<sub>3</sub>-13TiO<sub>2</sub></li> <li>Properties similar to Al<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>, but softer and less resistant to chemicals</li> </ul>
	ALO-188	neg. / 1.2 g/cc	(-31 μm)	---	<ul style="list-style-type: none"> <li>Useable up to 1000°F (538°C)</li> </ul>
TiO <sub>2</sub> 44.0 Al <sub>2</sub> O <sub>3</sub> balance	ALO-121	neg. / 2.6 g/cc	-325 m / +11 μm (-45 / +11 μm)	---	<ul style="list-style-type: none"> <li>Fused Al<sub>2</sub>O<sub>3</sub>-44TiO<sub>2</sub></li> <li>Properties similar to Al<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>, but softer and less resistant to chemicals</li> <li>Useable up to 1000°F (538°C)</li> <li>Excellent finishing properties</li> </ul>





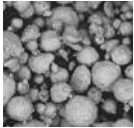
## CHROMIUM OXIDE-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
99.0 Cr <sub>2</sub> O <sub>3</sub>	CRO-131	neg. / 2.5 g/cc	-400 m / +5 μm (-38 / +5 μm)	CPW 320 BMS 10-67K Type IV	<ul style="list-style-type: none"> <li>• Reacted and sintered Cr<sub>2</sub>O<sub>3</sub></li> <li>• Hard, dense, wear-resistant coatings</li> <li>• Insoluble in acids, alkalis and alcohol</li> <li>• Useable up to 1000°F (540°C)</li> <li>• Excellent engraving properties</li> </ul>
	CRO-167	neg. / 2.4 g/cc	-325 m / +5 μm (-45 / +5 μm)	---	
	CRO-167-1	neg. / 2.5 g/cc	-325 m / +16 μm (-45 / +16 μm)	---	
	CRO-172	46 sec / 2.6 g/cc	-400 m / +11 μm (-38 / +11 μm)	---	
	CRO-174	neg. / 2.4 g/cc	(-22 / +2.8 μm)	CPW 320	
	CRO-179	neg. / 2.5 g/cc	-400 m / +11 μm (-38 / +11 μm)	---	
SiO <sub>2</sub> 4.5 TiO <sub>2</sub> 2.5 Cr <sub>2</sub> O <sub>3</sub> balance	CRO-192	neg. / 1.4 g/cc	-270 m / +11 μm (-53 / +11 μm)	---	<ul style="list-style-type: none"> <li>• Agglomerated and sintered, Cr<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>-TiO<sub>2</sub></li> <li>• Similar properties to Cr<sub>2</sub>O<sub>3</sub></li> <li>• Hard, dense, wear-resistant coatings</li> <li>• Resists impact better than Cr<sub>2</sub>O<sub>3</sub></li> </ul>
	CRO-192-1	---	-140 m / +16 μm (-106 / +16 μm)	---	

## ZIRCONIUM OXIDE-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Y <sub>2</sub> O <sub>3</sub> 7.5 ZrO <sub>2</sub> balance	ZRO-182	41 sec / 1.8 g/cc	-120 m / +22 μm (-125 / +22 μm)	A50TF278 CLA and CLB	<ul style="list-style-type: none"> <li>• Agglomerated and sintered ZrO<sub>2</sub>-8Y<sub>2</sub>O<sub>3</sub></li> <li>• Excellent thermal barrier properties</li> <li>• Stabilizes during spray process</li> <li>• Useful up to 2450°F (1343°C)</li> </ul>
	ZRO-113 / ZRO-114	5 sec / 1.5 g/cc	-140 m / +11 μm (-106 / +11 μm)	PWA 1375 A50TF278 CLC	
	ZRO-195-2	33 sec / 2.2 g/cc	-200 / +325 mesh (-75 / +45 μm)	MSRR 9507/46	
	AI-1075	30 sec / 2.3 g/cc	-140 m / +11 μm (-106 / +11 μm)	MSV-049 A50TF278 CLB and CLC PWA 1375 C-66 EMS 57750 Type 1 CL1	
	1484i / ZRO-236		-140 m / +16 μm (-106 / +16 μm)	A50TF278 CLB and CLC PWA 1375 CD 1233 C-66	





ZRO-236/1484i

## Ceramic Powders

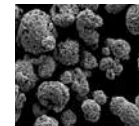
### ZIRCONIUM OXIDE-BASED POWDERS (CONTINUED)

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Y <sub>2</sub> O <sub>3</sub> 7.5 ZrO <sub>2</sub> balance	ZRO-271	--- / 1.6 g/cc	-140 m / +11 μm (-106 / +11 μm)	---	<ul style="list-style-type: none"> <li>• Agglomerated and sintered ZrO<sub>2</sub>-8Y<sub>2</sub>O<sub>3</sub></li> <li>• Ultra-low monoclinic powder</li> <li>• High purity</li> <li>• Low NORM content (naturally occurring radioactive material)</li> <li>• Excellent thermal barrier properties</li> <li>• Useful up to 2450°F (1343°C)</li> </ul>
	ZRO-271-3	--- / 1.6 g/cc	-325 mesh (-45 μm)	---	
	ZRO-271-4	--- / 0.95 g/cc	-170 / +16 mesh (-90 / +16 μm)	A50AG1 CLA	
	ZRO-271-5	37 sec / 1.7 g/cc	-120 / +325 mesh (-125 / +45 μm)	---	
Yb <sub>2</sub> O <sub>3</sub> 13.5 ZrO <sub>2</sub> 86.5	ZRO-146	---	-140 / +325 mesh (-106 / +45 μm)	SML-155	<ul style="list-style-type: none"> <li>• Agglomerated and sintered</li> </ul>
MgO 21.75 ZrO <sub>2</sub> balance	ZRO-103	neg. / 2.3 g/cc	-270 m / +11 μm (-53 / +11 μm)	PWA 1333 A50TF155-3 CLA	<ul style="list-style-type: none"> <li>• Fused and crushed ZrO<sub>2</sub>-22MgO</li> <li>• Good thermal barrier properties</li> <li>• Resistant to molten metals</li> <li>• Good particle erosion resistance</li> <li>• Useful up to 1700°F (927°C)</li> </ul>
Y <sub>2</sub> O <sub>3</sub> 9.5 Yb <sub>2</sub> O <sub>3</sub> 5.6 Gd <sub>2</sub> O <sub>3</sub> 5.2 ZrO <sub>2</sub> balance	ZRO-256	---	-140 m / +11 μm (-106 / +11 μm)	A50TF326 CLA EMS 56726	<ul style="list-style-type: none"> <li>• Agglomerated and sintered ZrO<sub>2</sub>-8Y<sub>2</sub>O<sub>3</sub></li> <li>• Useful in low-k applications</li> </ul>

### YTTRIUM OXIDE-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Y <sub>2</sub> O <sub>3</sub> 99.9 min	YO-118	--- / 1.0 g/cc	-325 m / +5 μm (-45 / +5 μm)	---	<ul style="list-style-type: none"> <li>• Agglomerated and sintered</li> <li>• High-purity material</li> <li>• Electronic applications</li> </ul>
	YO-118-1	---	-200 mesh (-75 μm)	---	
Y <sub>2</sub> O <sub>3</sub> 99.95 min	YO-125	--- / 1.0 g/cc	-325 m / +5 μm (-45 / +5 μm)	---	<ul style="list-style-type: none"> <li>• Agglomerated and sintered</li> <li>• Ultra-high-purity material</li> <li>• Electronic applications</li> </ul>
Y <sub>2</sub> O <sub>3</sub> 99.95 min	YO-123	---	-140 m / +11 μm (-106 / +11 μm)	---	<ul style="list-style-type: none"> <li>• Agglomerated and sintered</li> <li>• Ultra-high-purity material</li> <li>• Electronic applications</li> </ul>



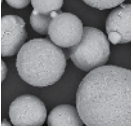


## CHROMIUM CARBIDE-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Cr <sub>3</sub> C <sub>2</sub> 99.0	CRC-105	neg. / 2.3 g/cc	-325 mesh (-45 μm)	PWA 1304	<ul style="list-style-type: none"> <li>Sintered Cr<sub>3</sub>C<sub>2</sub></li> <li>Usually blended with a metal for spraying</li> <li>Hard and wear resistant</li> <li>Useful up to 1600°F (871°C)</li> </ul>
	CRC-107	30 sec / 2.4 g/cc	-170 / +325 mesh (-90 / +45 μm)	PWA 1306	
NiCr 25.0 Cr <sub>3</sub> C <sub>2</sub> balance	CRC-300 / 1375VF	neg. / 2.3 g/cc	-325 m / +11 μm (-45 / +11 μm)	---	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> <li>Excellent for high-temperature cavitation, abrasion and sliding wear</li> <li>Good hot gas and corrosion resistance</li> <li>Very dense and hard coatings</li> <li>Useful up to 1600°F (871°C)</li> </ul>
	CRC-300-1 / 1375VM	32 sec / 2.3 g/cc	-325 m / +16 μm (-45 / +16 μm)	---	
NiCr 20.0 Cr <sub>3</sub> C <sub>2</sub> balance	CRC-351	---	-325 m / +16 μm (-45 / +16 μm)	B50A845 CLB	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> </ul>
NiCr 25.0 Cr <sub>3</sub> C <sub>2</sub> 75.0	CRC-106	neg. / 2.5 g/cc	-325 m / +5 μm (-45 / +5 μm)	AMS 7875 MSRR 9507/17 PM 819-05 B50A893 DMR 33.006 B50TF137 CLA	<ul style="list-style-type: none"> <li>Blended Cr<sub>3</sub>C<sub>2</sub> and NiCr</li> <li>Excellent for high-temperature cavitation, abrasion and sliding wear</li> <li>Good hot gas and corrosion resistance</li> <li>Hard and wear resistant</li> <li>Useful up to 1600°F (871°C)</li> </ul>
	CRC-108	30 sec / 2.5 g/cc	-170 m / +11 μm (-90 / +11 μm)	EMS 57753 Type I B50TF137 CLB MIL-P-85856-42 PWA 1307 PM 819-07 MSRR 9507/2 DMR 33.005	
	CRC-174	31 sec / 2.5 g/cc	-270 m / +16 μm (-53 / +16 μm)	---	







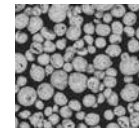
CRC-410-1

## Carbide Powders

### APT (ADVANCED POWDER TECHNOLOGY) POWDERS

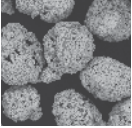
Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Ni 8.0 C 4.0 Cr balance	CRC-410	17 sec / 3.9 g/cc	-270 m / +16 $\mu$ m (-53 / +16 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Atomized, fully alloyed CrC-NiCr powder</li> <li>Improved DE and stress properties over traditional blended CrC-NiCr</li> <li>Excellent for high-temperature cavitation, abrasion and sliding wear</li> <li>Good hot gas and corrosion resistance</li> <li>Useful up to 1600°F (871°C)</li> </ul>
	CRC-410-1	19 sec / 3.7 g/cc	-325 m / +11 $\mu$ m (-45 / +11 $\mu$ m)	B50TF301 CLA MSV-027	
Ni 21.5 C 3.4 Cr balance	CRC-425	17 sec / 4.0 g/cc	-270 m / +16 $\mu$ m (-53 / +16 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Atomized CrC-NiCr powder</li> <li>Similar to CRC-410 alloys, with improved ductility, greater toughness and slightly lower hardness</li> </ul>
Cr 34.0 Co 20.0 C 4.0 W balance	W-121	12 sec / 5.1 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Atomized WC-CoCr powder</li> <li>Excellent DE (55-65%), flow, and spray-ability</li> <li>Candidate for hard chrome replacement</li> <li>Good sliding wear and mating properties</li> </ul>
	W-121-1	11 sec / 5.2 g/cc	-270 m / +22 $\mu$ m (-53 / +22 $\mu$ m)	---	
Cr 48.0 Co 12.0 C 4.0 W balance	W-124	13 sec / 4.9 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Atomized WC-CoCr powder</li> <li>Designed as a superior alternative to traditional WC alloys</li> <li>Good toughness and corrosion resistance</li> <li>Excellent DE (55-65%), flow and spray-ability</li> <li>Superior wear-resistant properties</li> <li>Candidate for hard chrome replacement</li> </ul>
Cr 43.5 Ni 18.0 C 3.5 W balance	W-129	12 sec / 4.9 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Atomized WC-NiCr powder</li> <li>Excellent DE (55-65%), flow, and spray-ability</li> <li>Candidate for hard chrome replacement</li> <li>Good sliding wear and mating properties</li> </ul>





## TUNGSTEN CARBIDE-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Co 10.0 C 5.3 Cr 4.0 W balance	WC-113	neg. / 4.5 g/cc	-325 m / +5 $\mu\text{m}$ (-45 / +5 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Sintered and crushed</li> <li>Improved oxidation and corrosion protection over WC-Co and WC-Ni</li> </ul>
	WC-436-1	18 sec / 4.5 g/cc	-270 m / +16 $\mu\text{m}$ (-53 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Excellent low-temperature wear properties</li> <li>Useful up to 900°F (482°C)</li> </ul>
Co 10.0 C 5.3 Cr 4.0 W balance	WC-731 / 1350VF	18 sec / 4.6 g/cc	-400 m / +11 $\mu\text{m}$ (-38 / +11 $\mu\text{m}$ )	AMS 7882 PCS 2561	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> <li>Similar properties as other WC-CoCr</li> </ul>
	WC-731-1 / 1350VM	19 sec / 4.5 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	AMS 7882 BMS 10-67K Type XVII LGMS 9011 Type II PCS 2561	<ul style="list-style-type: none"> <li>Densified structure with fine carbide dispersion promotes finer microstructure, better DE, and denser, smoother coatings</li> <li>Excellent flowability</li> <li>Useful up to 900°F (482°C)</li> </ul>
	WC-731-6	--- / 4.1 g/cc	(-31 / +5 $\mu\text{m}$ )	---	
Co 10.0 C 5.3 Cr 4.0 W balance	WC-819	---	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> <li>Lower-cost alternative to 1350VM</li> <li>Densified structure with fine carbide dispersion promotes finer microstructure, better DE, and denser, smoother coatings</li> <li>Useful up to 900°F (482°C)</li> </ul>
Co 11.0 C 4.0 W balance	WC-726 / 1320Q	neg. / 5.0 g/cc	-325 mesh (-45 $\mu\text{m}$ )	PWA 1379-1 PWA 1379-2 AMS 7879	<ul style="list-style-type: none"> <li>Agglomerated and sintered WC-Co</li> <li>Excellent low-temperature wear properties</li> <li>Dense, hard coating with marginal oxidation and corrosion resistance</li> <li>Useful up to 900°F (482°C)</li> </ul>
	WC-793	---	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	
Co 12.0 C 3.9 W balance	WC-104	12 sec / 6.1 g/cc	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	PWA 1302 EMS 57745 Type 1 CL1 ORS 0990 JA 1302	<ul style="list-style-type: none"> <li>Cast and crushed carbide</li> <li>Excellent low-temperature wear properties</li> <li>Dense, hard coating with marginal oxidation and corrosion resistance</li> <li>Useful up to 900°F (482°C)</li> </ul>
	WC-106	neg. / 5.9 g/cc	-325 mesh (-45 $\mu\text{m}$ )	PWA 1379-2 AMS 7879 BMS 10-67K Type I	
Co 12.0 C 5.4 W balance	WC-114	16 sec / 4.9 g/cc	-325 mesh (-45 $\mu\text{m}$ )	B50TF27 CLA and CLB PM 819-25	<ul style="list-style-type: none"> <li>Sintered and crushed carbide</li> <li>Excellent low-temperature wear properties</li> <li>Dense, hard coating with marginal oxidation and corrosion resistance</li> <li>Useful up to 900°F (482°C)</li> </ul>
	WC-489-1	16 sec / 4.9 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	---	
Co 12.0 C 5.5 W balance	WC-727 / 1342VF	18 sec / 4.3 g/cc	-400 m / +11 $\mu\text{m}$ (-38 / +11 $\mu\text{m}$ )	B50TF27 CLA and CLB	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> <li>Similar properties as other WC-12Co</li> </ul>
	WC-727-1 / 1342VM	20 sec / 4.4 g/cc	-325 m / +16 $\mu\text{m}$ (-45 / +16 $\mu\text{m}$ )	B50TF27 CLA	<ul style="list-style-type: none"> <li>Densified structure with fine carbide dispersion promotes finer microstructure, better DE, and denser, smoother coatings</li> <li>Excellent flowability</li> <li>Useful up to 900°F (482°C)</li> </ul>
	WC-727-5	---	(-31 / +11 $\mu\text{m}$ )	---	
	WC-727-6	---	(-31 / +5 $\mu\text{m}$ )	---	



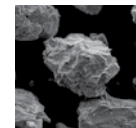
1343VM/WC-729-1

## Carbide Powders

### TUNGSTEN CARBIDE-BASED POWDERS (CONTINUED)

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Co 16.8 C 5.2 W balance	WC-128-2	13 sec / 5.6 g/cc	-270 m / +22 $\mu$ m (-53 / +22 $\mu$ m)	CP 6004 DMR 33.019 MSRR 9507/1	<ul style="list-style-type: none"> <li>Sintered and crushed</li> <li>Higher Co levels provide better toughness, impact strength and ductility than WC-12Co</li> <li>Densified structure promotes superior coating density and powder flow</li> <li>Useful up to 900°F (482°C)</li> </ul>
Co 16.8 C 5.2 W balance	WC-559	16 sec/ 4.0 g/cc	-270 m / +22 $\mu$ m (-53 / +22 $\mu$ m)	B50TF167 CLA and CLC EMS 39660	<ul style="list-style-type: none"> <li>Plasma densified powder</li> <li>Higher Co levels provide better toughness, impact strength and ductility than WC-12Co</li> <li>Densified structure promotes superior coating density and powder flow</li> <li>Useful up to 900°F (482°C)</li> </ul>
Co 17.0 C 5.0 W balance	WC-729 / 1343VF	neg. / 4.2 g/cc	-400 m / +11 $\mu$ m (-38 / +11 $\mu$ m)	PWA 36331-2 MSRR 9507/69	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> <li>Higher Co levels provide better toughness, impact strength and ductility than WC-12Co</li> </ul>
	WC-729-1 / 1343VM	20 sec / 4.3 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	ECS-L 2279 Annexe 1 BMS 10-67K Type I MSRR 9507/69 PWA 36331-1 AMS 7881 B50TF167 CLA	<ul style="list-style-type: none"> <li>Densified structure promotes superior coating density and powder flow</li> <li>Excellent flowability</li> <li>Useful up to 900°F (482°C)</li> </ul>
	WC-729-5	--- / 4.7 g/cc	(-31 / +5 $\mu$ m)	---	
Cr 20.0 Ni 6.3 C 5.9 W balance	WC-496	21 sec / 3.2 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	MSV-067	<ul style="list-style-type: none"> <li>Sintered and crushed</li> <li>Superior oxidation and corrosion properties than other WC-based materials</li> <li>Better chemical resistance than other WC-based materials</li> <li>Useful up to 1400°F (760°C)</li> </ul>
Cr 20.0 Ni 6.5 C 5.8 W balance	WC-733 / 1356VM	20 sec / 4.4 g/cc	-325 m / +16 $\mu$ m (-45 / +16 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> <li>Similar properties as other WC-NiCr</li> <li>Densified structure with fine carbide dispersion promotes finer microstructure, better DE, and denser, smoother coatings</li> <li>Excellent flowability</li> <li>Useful up to 1400°F (760°C)</li> </ul>
Ni 10.0 C 5.5 W balance	WC-724 / 1310VF	19 sec / 4.5 g/cc	-325 m / +11 $\mu$ m (-45 / +11 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Agglomerated and sintered</li> <li>Better corrosion protection than WC-Co</li> <li>Excellent low-temperature wear properties up to 900°F (482°C)</li> <li>Superior deposition efficiency (DE)</li> </ul>
	WC-724-1 / 1310VM	20 sec / 4.4 g/cc	-270 m / +16 $\mu$ m (-53 / +16 $\mu$ m)	---	
Ni 36.3 Cr 7.3 Fe 2.3 Si 2.3 B 1.6 WC-12Co balance	WC-735-1	22 sec / 4.3 g/cc	-270 m / +16 $\mu$ m (-53 / +16 $\mu$ m)	---	<ul style="list-style-type: none"> <li>Blended WC-12Co + NiCrSiFeB</li> <li>Excellent combination of abrasion resistance and toughness</li> <li>Economical solution to severe wear applications</li> <li>Useful up to 900°F (482°C)</li> </ul>

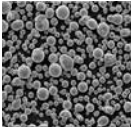




## PRECIOUS METAL-BASED POWDERS

Chemistry	Powder Name	Hall Flow / Density	Size	OEM Specs	Quick Facts
Ni 18.0 Au balance	AU-103	---	-200 mesh (-75 $\mu\text{m}$ )	PWA 698 AMS 4787	• Atomized Au-18Ni alloy
	AU-103-2	---	-140 mesh (-106 $\mu\text{m}$ )	AMS 4787 PWA 698	
Pd 30.5 Cr 10.5 B 2.5 Ni balance	NI-680	---	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	B50TF198 CLB LM 69-009-500	• Atomized NiPdCrB alloy
	NI-680-1	---	-35 / +325 mesh (-500 / +45 $\mu\text{m}$ )	B50TF198 CLC	
Pd 36.0 Cr 10.5 B 2.9 Si 0.6 Ni balance	NI-538	---	-325 mesh (-45 $\mu\text{m}$ )	LM 69-178-490 PWA 36099	• Atomized NiPd alloy • High resistance to corrosion and oxides • Use in high-temperature environments
	NI-538-6	---	-120 / +325 mesh (-125 / +45 $\mu\text{m}$ )	LM 69-178-510	





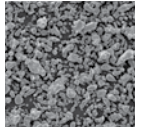
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## Braze Powders

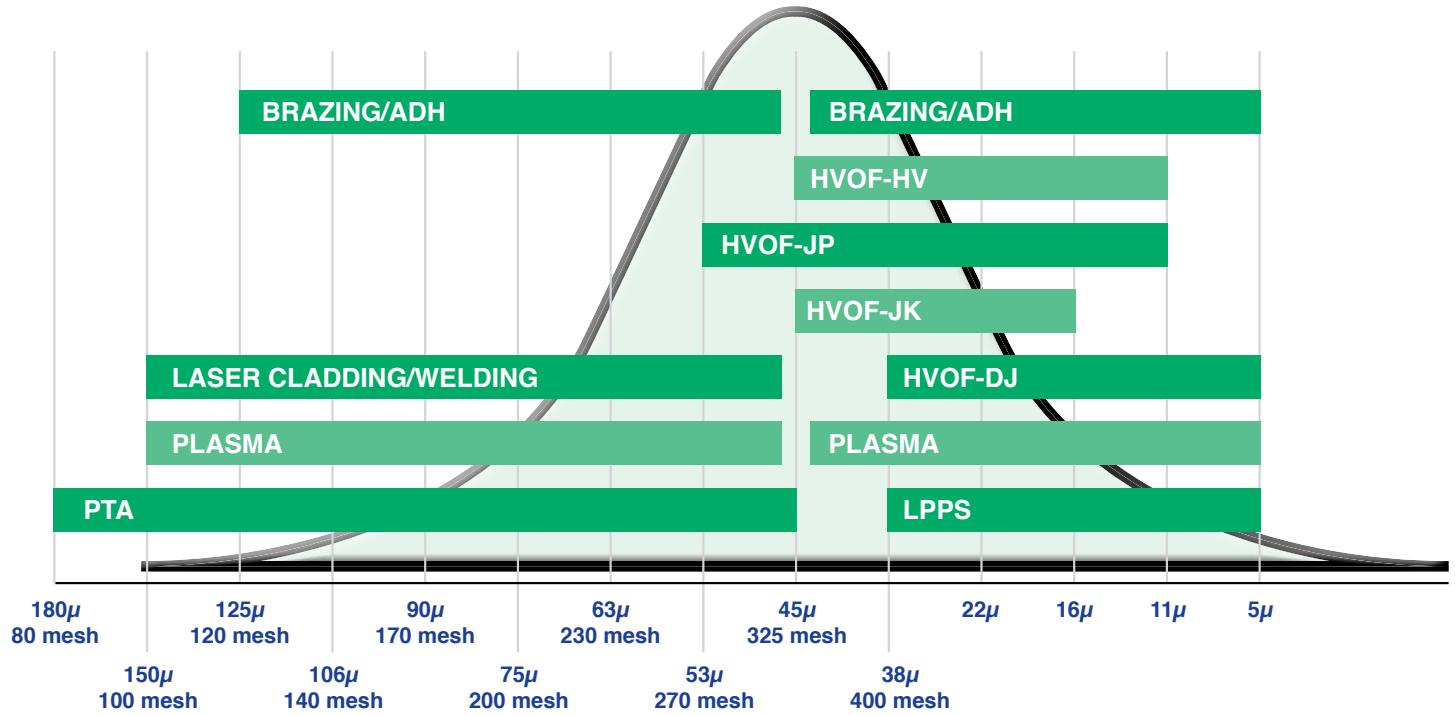
### BRAZE POWDERS

Chemistry	Powder Name	Melting Temperature		Brazing Ranges	Recommended OEM Specs	Quick Facts
		Solidus	Liquidus			
Cr 19.0 Ni 17.0 Si 8.0 W 4.0 B 0.8 C 0.4 Co balance	CO-216	1121°C 2050°F	1149°C 2100°F	1149-1232°C 2100-2250°F	AMS 4783 MS 1112	<ul style="list-style-type: none"> <li>Designed for brazing of superalloys and cobalt-based components</li> <li>High-temperature strength</li> <li>Oxidation resistance</li> <li>Low base metal penetration</li> </ul>
Cr 14.5 Fe 4.5 Si 4.5 B 3.3 C 0.8 Ni balance	NI-167	977°C 1790°F	1038°C 1900°F	1066-1204°C 1900-2200°F	AMS 4775	<ul style="list-style-type: none"> <li>Yields high-strength joints suitable for high-temperature applications</li> <li>Recommended for gas turbine hardware</li> </ul>
Cr 15.0 B 3.5 Ni balance	NI-276	1020°C 1870°F	1050°C 1925°F	1066-1150°C 1950-2100°F	MS 1090 PWA 36962 B50TF207 CLA CD 1125	<ul style="list-style-type: none"> <li>Silicon-free metal</li> <li>Suitable for diffusion brazing applications</li> <li>Excellent strength and resistance to high-temperature oxidation</li> </ul>
Si 4.5 B 2.9 Ni balance	NI-298	982°C 1800°F	1038°C 1900°F	1010-1177°C 1850-2150°F	CD 1067 B50TF205 CLA AMS 4778	<ul style="list-style-type: none"> <li>General utility filler metal</li> <li>Recommended for use where deep recesses and alloy is free flowing and wets well</li> </ul>
Cr 7.0 Si 4.2 Fe 3.0 B 3.0 Ni balance	NI-362-3	971°C 1780°F	999°C 1830°F	1010-1177°C 1830-2150°F	CD 1068 B50TF204 CLA	<ul style="list-style-type: none"> <li>Similar to NI-167 but permits brazing at much lower temperatures</li> <li>Excellent flow characteristics without intergranular attack (IGA) or other base dilutions</li> <li>Ideal choice for joining thin sections such as heat exchanger or honeycomb components</li> </ul>
Cr 19.0 Si 10.0 Ni balance	NI-430	1079°C 1975°F	1135°C 2075°F	1147-1204°C 2100-2200°F	B50A935 CLA AMS 4782 B50TF81 CLA	<ul style="list-style-type: none"> <li>Provides strong, tough joints</li> <li>Excellent high-temperature performance</li> <li>Recommended for nuclear applications or those where boron cannot be tolerated</li> </ul>
Co 21.8 Cr 15.0 Si 3.5 B 2.9 Ni balance	NI-449-4	954°C 1750°F	1129°C 2065°F	1135-1205°C 2075-2200°F	B50TF208 CLA	<ul style="list-style-type: none"> <li>Excellent for applications with tight tolerances and thin sections</li> <li>Cobalt promotes wetting and braze alloy solid solutioning to provide joints with superior fatigue resistance</li> </ul>
Si 3.5 B 1.9 Ni balance	NI-489	982°C 1800°F	1066°C 1950°F	1010-1177°C 1950-2150°F	B50TF206 CLA CD 1176 AMS 4779	<ul style="list-style-type: none"> <li>Broad melt range and flowability</li> <li>Moderate hardness</li> <li>Sluggish alloy that is appropriate for wide-gap applications</li> </ul>
Cr 13.5 Fe 4.5 Si 4.5 B 2.9 Ni balance	NI-510	977°C 1790°F	1077°C 1970°F	1077-1204°C 1970-2200°F	AMS 4776	<ul style="list-style-type: none"> <li>Chemically similar to NI-167, except lower carbon content to reduce carbide formation</li> <li>Sluggish alloy that is appropriate for wide-gap applications</li> <li>Resistant to chemical attack</li> </ul>

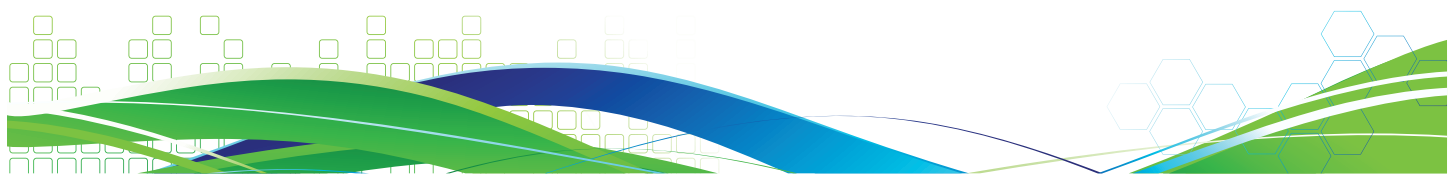




TYPICAL PARTICLE SIZE DISTRIBUTIONS



Mesh	Micron
80	180
100	150
120	125
140	106
170	90
200	75
230	63
270	53
325	45
400	38







# More sustainable solutions

At Praxair Surface Technologies, we're committed to sustainable development. We look for sustainability in all areas of operation, including:

**Governance and integrity:** We maintain strong systems and a culture of global corporate governance, compliance, ethics, human rights, integrity and accountability.

**Strategic leadership:** We stay current with, and take advantage of, emerging global opportunities, developments and challenges to position Praxair Surface Technologies for the future.

**Customer commitment:** We focus relentlessly on the delivery of customer value through continuous innovation that helps our customers enhance their product quality, service, reliability, productivity, safety, energy efficiency and environmental performance.

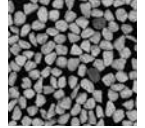
**Environmental responsibility:** We are constantly striving to improve the environmental performance and energy efficiency of our operations.

**Employee safety and development:** We provide opportunities that allow employees to develop to their fullest potential in a creative, inclusive and safe environment.

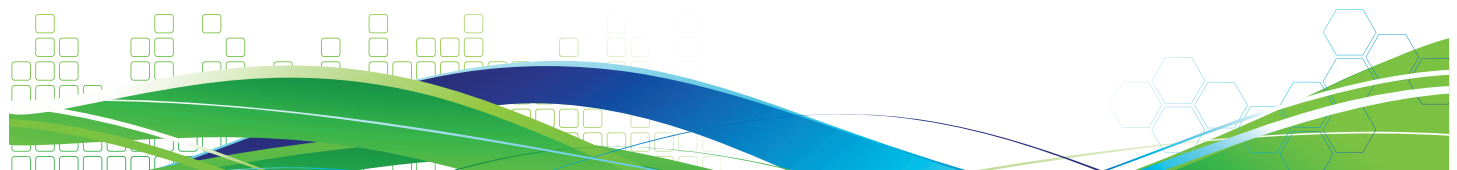
**Community support:** We participate in community development in regions where we operate.

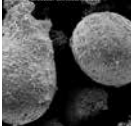
**Financial performance:** Over the past 10 years, Praxair has consistently outperformed companies in the S&P 500T Index.

**Stakeholder engagement and communication:** We partner with internal and external stakeholders to achieve a strong, secure and sustainable society, economy and environment.



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B-59	4	B50TF185 CLA	3	BMS 10-67K Type XIV	5	CPW 528-1	11
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B50A988 CLB	3	B50TF242 CLB	9	C-83	10	DMR 33.008	3
B50A989 CLB	4	B50TF242 CLC	9	C-89	14	DMR 33.011	7
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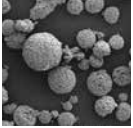
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If you cannot find the powder you are looking for by name, composition, particle size, or type, please contact us. We specialize in custom powders and tailored sizes.







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