

A decorative graphic at the top of the page features a blue background with a series of red, wavy, fiber-like lines. Scattered across these lines are various grey, spherical and irregularly shaped particles, representing thermal spray materials.

SULZER

Sulzer Metco

Thermal Spray Materials Guide

Issued May 2004

Combustion Powder Spray / Abradables and Plastics / Nickel Base (continued)

Metco 308NS-3

Chemistry: Ni 15 Graphite
 Particle Size: -90 +30 µm (-170 mesh +30 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings.

OEM Specifications:

GE B50TF53, Class B
 MTU MTS 1071
 Rolls-Royce MSRR 9507/16
 Volvo PM 819-34

New! Durabrade 2231

Chemistry: Ni 20 Graphite
 Particle Size: -106 +45 µm (-140 +325 mesh)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating can be used for friction reducing bearings. Formerly supplied by Westaim Ambeon as Westaim 2231

OEM Specifications:

GE B50TF172, Class A
 Honeywell Allied Signal EMS 57739

Metco 309NS-3

Chemistry: Ni 20 Graphite
 Particle Size: -106 +45 µm (-140 +325 mesh)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings.

OEM Specifications:

GE B50TF172, Class A
 Honeywell Allied Signal EMS 57739
 Volvo PM 819-45

New! Durabrade 2222

Chemistry: Ni 25 Graphite
 Particle Size: -90 +30 µm (-170 mesh +30 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings. Formerly supplied by Westaim Ambeon as Westaim 2222

OEM Specifications:

Honeywell Allied Signal FP 5045, Type XII
 Pratt Whitney PWA 1352-1

Metco 307NS

Chemistry: Ni 25 Graphite
 Particle Size: -90 +30 µm (-170 mesh +30 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings.

OEM Specifications:

Honeywell Allied Signal EMS 57739, Class 2 (only)
 Honeywell Allied Signal FP 5045, Type XII, Table 1
 Pratt Whitney PWA 1352-1
 Volvo PM 819-41

New! Durabrade 2223

Chemistry: Ni 25 Graphite
 Particle Size: -90 +20 µm (-170 mesh +20 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings. Formerly supplied by Westaim Ambeon as Westaim 2223

OEM Specifications:

Rolls-Royce MSRR 9507/6

Combustion Powder Spray / Abradables and Plastics / Nickel Base (continued)

New!

Durabrade 2224

Chemistry: Ni 25 Graphite
 Particle Size: -90 +20 µm (-170 mesh +20 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings. Formerly supplied by Westaim Ambeon as Westaim 2224

OEM Specifications:

Rolls-Royce Allison EMS 56754
 Rolls-Royce MSRR 9507/12

Metco 307NS-2

Chemistry: Ni 25 Graphite
 Particle Size: -90 +20 µm (-170 mesh +20 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings.

OEM Specifications:

Rolls-Royce MSRR 9507/6

New!

Durabrade 2221

Chemistry: Ni 25 Graphite
 Particle Size: -90 +30 µm (-170 mesh +30 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings. Formerly supplied by Westaim Ambeon as Westaim 2221

OEM Specifications:

GE B50TF52, Class B

Metco 307NS-3

Chemistry: Ni 25 Graphite
 Particle Size: -90 +30 µm (-170 mesh +30 µm)
 Morphology: Clad
 Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings.

OEM Specifications:

GE B50TF52, Class B
 SNECMA DMR 33.084
 Volvo PM 819-81

New!

Durabrade 2311

Chemistry: Ni 4Cr 4Al 21 Calcined Bentonite Clay
 Particle Size: -150 +45 µm (-100 +325 mesh)
 Morphology: Clad
 Properties & Applications: Bentonite-containing abradable materials are suitable for higher operating temperatures to 815°C (1500°F). Formerly supplied by Westaim Ambeon as Westaim 2311.

OEM Specifications:

GE B50TF232, Class A
 Honeywell Allied Signal FP 5045, Type XXV
 Pratt Whitney PWA 1393
 Rolls-Royce MSRR 9507/45
 Volvo PM 819-54

New!

Durabrade 2312

Chemistry: Ni 4Cr 4Al 21 Calcined Bentonite Clay
 Particle Size: -150 +45 µm (-100 +325 mesh)
 Morphology: Clad
 Properties & Applications: Bentonite-containing abradable materials are suitable for higher operating temperatures to 815°C (1500°F). Formerly supplied by Westaim Ambeon as Westaim 2312

OEM Specifications:

Honeywell Allied Signal FP 5045, Type XXV
 Pratt Whitney PWA 1393
 Rolls-Royce MSRR 9507/45

Combustion Powder Spray / Abradables and Plastics / Nickel Base (continued)

Metco 312NS

Chemistry: Ni 4Cr 4Al 21 Calcined Bentonite Clay
 Particle Size: -150 +45 µm (-100 +325 mesh)
 Morphology: Clad
 Properties & Applications: Bentonite-containing abradable materials are suitable for higher operating temperatures to 815°C (1500°F).

OEM Specifications:

GE B50TF232, Class A
 Honeywell Allied Signal FP 5045AB, Type XXV
 Pratt Whitney PWA 1393
 Rolls-Royce MSRR 9507/45
 Volvo PM 819-54

Metco 312NS-1

Chemistry: Ni 4Cr 4Al 21 Calcined Bentonite Clay
 Particle Size: -150 +45 µm (-100 +325 mesh)
 Morphology: Clad
 Properties & Applications: Premium grade material with tightly controlled chemistry and particle size distribution. Bentonite-containing abradable materials are suitable for higher operating temperatures to 815°C (1500°F).

OEM Specifications:

GE B50TF232, Class A
 Volvo PM 819-54

New! Durabrade 2313

Chemistry: Ni 4Cr 4Al 21 Calcined Bentonite Clay
 Particle Size: -150 +75 µm (-100 +200 mesh)
 Morphology: Clad
 Properties & Applications: Bentonite-containing abradable materials are suitable for higher operating temperatures to 815°C (1500°F). Formerly supplied by Westaim Ambeon as Westaim 2313

OEM Specifications:

Rolls-Royce MSRR 9507/54

Metco 314NS

Chemistry: Ni 4Cr 4Al 21 Calcined Bentonite Clay
 Particle Size: -150 +75 µm (-100 +200 mesh)
 Morphology: Clad
 Properties & Applications: Bentonite-containing abradable materials are suitable for higher operating temperatures to 815°C (1500°F).

OEM Specifications:

Rolls-Royce MSRR 9507/54

Metco 301C-NS

Chemistry: Ni 14Cr 8Fe 5.5BN 3.5Al
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Clad
 Properties & Applications: High quality abradable coating material for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings.

OEM Specifications:

Rolls-Royce MSRR 9507/10

Metco 301NS

Chemistry: Ni 14Cr 8Fe 5.5BN 3.5Al
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Clad
 Properties & Applications: High quality abradable coating material for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings.

OEM Specifications:

Honeywell M3970
 Honeywell Allied Signal FP 5045, Type XX
 Pratt Whitney PWA 1342
 Rolls-Royce Allison EMS 56730
 SNECMA DMR 33.085
 Volvo PM 819-66

Combustion Powder Spray / Abradables and Plastics / Nickel Base (continued)

New!

Durabrade 2211

Chemistry: Ni 40 Graphite
Particle Size: -90 +30 μm (-170 mesh +30 μm)
Morphology: Clad
Properties & Applications: High quality abradable coatings for use in the compressor section of jet engines. Operating temperatures up to approximately 480°C (900°F). Self-lubricating, can be used for friction reducing bearings. Should be blended with NiCrAl (Metco 443NS or AMDRY 960) in a proportion of 32.5% abradable to 67.5% NiCrAl. Formerly supplied by Westaim Ambeon as Westaim 2211

OEM Specifications:

GE B50TF164 Class A & B

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Aluminum Base

Aluminum alloys are used for repair of worn aluminum and magnesium substrates. They are also used for low temperature clearance control applications and machining purposes. Aluminum Silicon alloys should not be exposed to temperatures approaching 315 °C (600 °F) or greater, as they are prone to over ageing characterized by a reduction in hardness and the precipitation of secondary silicon based phases in the alloy. Aluminum-iron composites result in one-step exothermic reactions, producing coatings that are self-bonding to aluminum substrates.

Metco 54NS-1

Chemistry: Al 99%
 Particle Size: -75 +45 µm (-200 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Corrosion resistant in coastal and industrial atmospheric conditions. Good electrical and thermal conductivity. Relatively soft and ductile, can be used to repair aluminum and magnesium base alloy parts. Non-magnetic, can be used for electromagnetic shielding.

OEM Specifications:

CFM International CP 6028
 GE B50TF57, Class A
 Jet Avion JA1320
 MTU MTS 1052
 Pratt Whitney PWA 1320
 Rolls-Royce MSRR 9507/13
 Volvo PM 819-23

Metco 54NS

Chemistry: Al 99%
 Particle Size: -90 +45 µm (-170 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Corrosion resistant in coastal and industrial atmospheric conditions. Good electrical and thermal conductivity. Relatively soft and ductile, can be used to repair aluminum and magnesium base alloy parts. Non-magnetic, can be used for electromagnetic shielding.

OEM Specifications:

Boeing BMS 10-67, Type VII
 Canada Pratt Whitney CPW 220
 Honeywell Allied Signal EMS 57743
 Pratt Whitney PWA 1320
 Rolls-Royce Allison EMS 38850
 SNECMA DMR 33.012
 U. S. Military USAF 67A 60753A
 Voight 207-2-402

Metco 52C-NS

Chemistry: Al 12Si
 Particle Size: -90 +45 µm (-170 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Salvage and build-up of parts made of aluminum, magnesium and their alloys. Good machine finish.

OEM Specifications:

Canada Pratt Whitney CPW 235
 GE B50TF92, Class A
 Honeywell M 3962
 Honeywell Allied Signal EMS 57742
 Pratt Whitney PWA 1335
 Rolls-Royce MSRR 9507/60
 Rolls-Royce Allison EMS 56766
 SNECMA DMR 33.027
 U. S. Military MIL-P-83348, Type 1, Comp. E
 Volvo PM 819-35

Metco 446

Chemistry: Al 25Fe 7Cr 5Ni
 Particle Size: -106 +45 µm (-140 +325 mesh)
 Morphology: Clad
 Properties & Applications: Self-bonding, dense coatings. Good color match to aluminum and magnesium alloys. Excellent machinability.

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Cobalt Base

Sulzer Metco's family of cobalt based materials is used in applications to resist high temperature wear, hot corrosion and oxidation, as well as for restoration of cobalt substrates. The CoCrNiWC (Stellite family) alloys benefit from the addition of carbon to improve hardness and wear properties. Post-coating heat-treatment of cobalt based alloys can enhance overall performance.

Metco 45C-NS

Chemistry: Co 25.5Cr 10.5Ni 7.5W 0.5C

Particle Size: -75 + 45 μm (-200 +325 mesh)

Morphology: Water Atomized

Properties & Resists wear by abrasive grains, hard surfaces, fretting and particle

Applications: erosion to high temperature environments between 540-840°C (1000-1550°F).

OEM Specifications:

Canada Pratt Whitney CPW 218

Pratt Whitney PWA 1318

Rolls-Royce MSRR 9507/3

SNECMA DMR 33.007

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Copper Base

Coatings of copper based materials have many diverse applications, including repair of copper based substrates, anti-fretting applications, soft bearing applications, electrical and thermal conductance and anti corrosion (befouling) applications. Mechanically composited alloys of copper with aluminum result in self-bonding one step materials that are used for repair applications. The additions of nickel into copper increases the operating temperature limits of pure copper and makes the alloy more corrosion resistant. Aluminum bronze alloys are more wear and oxidation resistant than pure copper materials. (Recommended upper application temperature limit of pure copper is 230 °C (450 F°).

Metco 55

Chemistry: Cu 99%
 Particle Size: -90 +45 µm (-170 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Good electrical and thermal conductivity. Used in the paper and printing industry to resist corrosive effects of inks. Can be used for build-up and repair of copper base alloys. Non-magnetic, can be used for electromagnetic shielding.

OEM Specifications:

Rockwell Int. RB0170-251 (*Made to order only as Metco 55NS*)
 Rolls-Royce MSRR 9507/11

Metco 445

Chemistry: Cu 10 Al Aluminum Bronze
 Particle Size: -106 +45 µm (-140 +325 mesh)
 Morphology: Clad
 Properties & Applications: Typical parts which may be coated are pumps (cavitation resistance), piston guides (soft bearing surfaces), shifter forks and compressor air seals. Moderate oxidation, wear and fretting resistance at low temperatures, good emergency dry running properties. Can be used for build-up and repair of copper base alloy parts. Melting temperature 1040°C (1900°F).

OEM Specifications:

Honeywell Allied Signal FP 5045, Type XVII
 Rolls-Royce MSRR 9507/38
 U. S. Military MIL 1687

Metco 51NS

Chemistry: Cu 9.5Al 1Fe
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Typical parts which may be coated are pumps (cavitation resistance), piston guides (soft bearing surfaces), shifter forks and compressor air seals. Moderate oxidation, wear and fretting resistance at low temperatures, good emergency dry running properties. Can be used for build-up and repair of copper base alloy parts. Melting temperature 1040°C (1900°F).

OEM Specifications:

GE B50TF161, Class A
 Rolls-Royce MSRR 9507/24

Metco 57NS

Chemistry: Cu 38Ni
 Particle Size: -75 +45 µm (-200 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Coatings are very dense with low porosity and oxide content.

OEM Specifications:

GE B50TF42, Class A
 Pratt Whitney PWA 1369
 SNECMA DMR 33.015
 Volvo PM 819-42

Metco 58NS

Chemistry: Cu 36Ni 5In
 Particle Size: -75 +45 µm (-200 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Produces dense coatings with good resistance to galling and fretting. Melting temperature 1150°C (2100°F). Applications: jet engine parts such as turbine blade roots.

OEM Specifications:

GE B50TF72, Class A
 Honeywell Allied Signal EMS 52432, Class XXXII
 Rolls-Royce MSRR 9507/31
 SNECMA DMR 33.016

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Iron Base

In general, additions of boron and carbon are added to increase the hardness and wear resistance of ferrous based coatings, while additions of chromium and nickel increase the temperature capability. High molybdenum containing alloys improves the sliding wear capability and improves the chemical corrosion resistance of 300 series stainless steels. Alloys of FeNi have improved machinability over pure nickel alloys. Application and processing temperatures may affect hardness and wear resistance of these coatings.

Metco 449P

Chemistry: Fe 3Al 3Mo 3C 0.1B
 Particle Size: -125 +45 μm (-120 +325 mesh)
 Morphology: Clad
 Properties & Applications: Recommended for salvage and build-up of ferrous base substrates, such as crankshaft journals. High carbon "steel" composite.

Metco 42C

Chemistry: Fe 16Cr 2Ni 0.2C (AISI Type 431 stainless steel)
 Particle Size: -106 +45 μm (-140 +325 mesh)
 Morphology: Water Atomized
 Properties & Applications: Corrosion resistant coating used mostly for repair and wear applications requiring a hard ground finish. The coatings may contain martensitic phases.

Metco 41C-NS

Chemistry: Fe 17Cr 12Ni 2.5Mo 2.3Si 0.1C (AISI Type 316 stainless steel)
 Particle Size: -106 +45 μm (-140 +325 mesh)
 Morphology: Water Atomized
 Properties & Applications: Premium grade austenitic nickel-chrome stainless steel. Coatings can be easily machined. Recommended for cavitation and low temperature erosion resistance.

OEM Specifications:

Rolls-Royce MSRR 9507/26

Metco 350NS

Chemistry: Fe 18Mo 3C 0.25Mn
 Particle Size: -90 +11 μm (-170 mesh +11 μm)
 Morphology: Clad
 Properties & Applications: Developed as an alternative to hard chrome plating. Protection against abrasive grains, wear from hard bearing surfaces and fretting.

AMDRY 959

Chemistry: Fe 37Ni 6Al
 Particle Size: -106 +45 μm (-140 +325 mesh)
 Morphology: Clad
 Properties & Applications: Material undergoes an exothermic reaction during spraying and forms a strong metallurgical bond with the base metal. Machinable coatings that are oxidation resistant up to 815°C (1500°F).

Metco 453

Chemistry: Fe 35Ni 5Al 5Mo
 Particle Size: -125 +45 μm (-120 +325 mesh)
 Morphology: Clad
 Properties & Applications: Recommended for salvage and repair of components such as diesel firedecks and cylinder heads.

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Iron Base (continued)**Metco 452**

Chemistry: Fe 38Ni 10Al
Particle Size: -125 +45 μm (-120 mesh +325)
Morphology: Clad
Properties & Applications: Material undergoes an exothermic reaction during spraying and forms a strong metallurgical bond with the base metal. Machinable coatings which are oxidation resistant up to 815°C (1500°F).

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Nickel Base

The large class of nickel based materials is used in many different market segments and applications. Key functions include bond coats for ceramic materials, self-bonding one-steps for salvage and repair applications, repair and restoration of superalloy substrates using a coating material of similar chemistry and alloys for general corrosion and sliding wear. Key additives to nickel alloys for oxidation/hot corrosion applications are chromium and aluminum, which affect the oxidation rate. Alloys with high chromium content are preferred for hot corrosion / sulfidation resistance. Self-bonding composites rely on aluminum to create an exothermic reaction during spraying that results in micro-welding" at the surface that improves bond strength and thickness limits.

Metco 56C-NS

Chemistry: Ni 99.5%
Particle Size: -75 +45 µm (-200 +325 mesh)
Morphology: Precipitated, Spheroidal
Properties & Applications: Can be used for salvage and build-up of nickel base alloy components which have been damaged or mis-machined.

OEM Specifications:

Rolls-Royce MSRR 9513

Metco 450P

Chemistry: Ni 4.5 Al
Particle Size: -90 +45 µm (-170 +325 mesh)
Morphology: Clad
Properties & Applications: Premium grade composite powder that produces dense, oxidation and abrasion resistant coatings with excellent machinability. Self-bonding and undergoes an exothermic reaction during spraying, resulting in excellent bonding to the substrate. Recommended for use up to 800°C (1470°F) as an oxidation-resistant bond coat. Applications: salvage and build-up on machinable carbon and corrosion resistant steels, particle erosion resistance for exhaust valve seats, oxidation resistance for exhaust mufflers and heat treating fixtures.

OEM Specifications:

Rolls-Royce MSRR 9507/43

AMDRY 956

Chemistry: Ni 5Al
Particle Size: -90 +45 µm (-170 +325 mesh)
Morphology: Clad
Properties & Applications: Coatings are dense and resistant to oxidation and abrasion. Self-bonding and undergoes an exothermic reaction during spraying, resulting in excellent bonding to the substrate. Recommended for use up to 800°C (1470°F) as an oxidation resistant bond coat. Applications: salvage and build-up on machinable carbon and corrosion resistant steels, particle erosion resistance for exhaust valve seats, oxidation resistance for exhaust mufflers and heat treating fixtures.

OEM Specifications:

Canada Pratt Whitney CPW 247
GE B50TF56, Class A
Honeywell M3951
Honeywell Allied Signal EMS 57746, Type I
Honeywell Allied Signal FP 5045, Type XV
MTU MTS 1080
Pratt Whitney PWA 1337
Rolls-Royce MSRR 9507/5
Rolls-Royce Allison EMS 56757
Rolls-Royce Allison PMI 1163
SNECMA DMR 33.011
Turbomeca LA 657 Ed. 1 PA2 Ind. 0
Volvo PM 819-37
Williams WIMS 644

Metco 450NS

Chemistry: Ni 5Al
Particle Size: -90 +45 µm (-170 +325 mesh)
Morphology: Clad
Properties & Applications: Coatings are dense and resistant to oxidation and abrasion. Self-bonding and undergoes an exothermic reaction during spraying, resulting in excellent bonding to the substrate. Recommended for use up to 800°C (1470°F) as an oxidation resistant bond coat. Applications: salvage and build-up on machinable carbon and corrosion resistant steels, particle erosion resistance for exhaust valve seats, oxidation resistance for exhaust mufflers and heat treating fixtures.

OEM Specifications:

Canada Pratt Whitney CPW 247
GE B50A891
GE B50TF56, Class A
Honeywell M3951
Honeywell Allied Signal EMS 57746, Type I
Honeywell Allied Signal FP 5045, Type XV
MTU MTS 1080
Pratt Whitney PWA 1337
Rolls-Royce MSRR 9507/5
Rolls-Royce Allison EMS 56757
SNECMA DMR 33.011
Williams WIMS 644

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Nickel Base (continued)

Metco 480NS

Chemistry: Ni 5Al
 Particle Size: -90+45 µm (-170+325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Coatings are dense and resistant to oxidation and abrasion. Recommended for use as oxidation-resistant bond coats which can be used up to 800°C (1470°F). Self-bonding and undergoes an exothermic reaction during spraying, resulting in excellent bonding to the substrate. Applications: salvage and build-up on machinable carbon and corrosion resistant steels, particle erosion resistance for exhaust valve seats, oxidation resistance for exhaust mufflers and heat treating fixtures.

OEM Specifications:

Canada Pratt Whitney CPW 490
 CFM International CP 6007
 GE B50TF56, Class B
 Honeywell Allied Signal EMS 57746, Type I, Class 1
 Pratt Whitney PWA 1380
 Rolls-Royce MSRR 9507/5
 Volvo PM 819-56

Sulzer Metco 7012

Chemistry: 91(Ni 10Cr 3Si 2.2B) 9(Ni 20Cr)
 Particle Size: -106 +44 µm (-140 +325 mesh)
 Morphology: Blend
 Properties & Applications: Coatings provide wear resistance and may be fused after spraying. Similar to Metco 12C but less prone to cracking and with somewhat lower hardness.

Metco 451

Chemistry: Ni 9.5Cr 2.5Si 1.5B 0.5Al
 Particle Size: -106 +22 µm (-140 +22 µm)
 Morphology: Blend
 Properties & Applications: Coatings are recommended for resistance to abrasive grains, particle erosion, cavitation resistance and salvage and build-up on grindable carbon and corrosion resistant steels.

New!

Metco 1102

Chemistry: Ni 18Al
 Particle Size: -90 +45 µm (-170 +325 mesh)
 Morphology: Clad
 Properties & Applications: Produces dense coatings that are resistant to oxidation and abrasion. For oxidation resistant bond coats which will operate at temperatures below 650°C (1200°F) Formerly supplied by Westaim Ambeon as Westaim 1101.

New!

Metco 2101

Chemistry: Ni 20Al
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Clad
 Properties & Applications: Produces a coarser coating than Metco 404NS. Dense coatings, resistant to oxidation and abrasion. For oxidation resistant bond coats which will operate at temperatures below 650°C (1200°F). Formerly supplied by Westaim Ambeon as Westaim 2101

OEM Specifications:

GE B50TF13, Class A & B

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Nickel Base (continued)

New!

Metco 2501

Chemistry: Ni Al / Ni
Particle Size: -125 +45 µm (-120 +325 mesh)
Morphology: Clad / Blend
Properties & Applications: Used to fill honeycomb then sintered at high temperatures to provide a thermal shield and improved abrasability at temperatures up to 1100°C (2000°F). Formerly supplied by Westaim Ambeon as Westaim 2501

OEM Specifications:

Rolls-Royce MSRR 9570

Metco 43C-NS

Chemistry: Ni 20Cr
Particle Size: -106 +45 µm (-140 +325 mesh)
Morphology: Water Atomized
Properties & Applications: Coatings designed to resist oxidation and corrosive gases in temperatures to 980°C (1800°F). Used to resist heat and prevent scaling of carbon and low alloy steels in hot atmospheres. Can be used as a bond coat under ceramic coatings.

OEM Specifications:

Boeing BMS 10-67, Type VI
Canada Pratt Whitney CPW 215
GE B50TF40 Class A
MTU MTS 1050
Pratt Whitney PWA 1315
Rolls-Royce MSRR 9507/8
Rolls-Royce Allison EMS 56760
SNECMA DMR 33.078

EU Sulzer Metco 4548

Chemistry: Ni 20Cr
Particle Size: -106 +38 µm (-140 +400 mesh)
Morphology: Water Atomized
Properties & Applications: Recommended for resistance to oxidation and corrosive gases to service temperatures of 980 °C (1800 °F). Resists heat and prevents scaling on carbon and low alloy steel substrates as a bond coat under ceramic top coats. Formerly supplied as PEM 43C.

Metco 44

Chemistry: Ni 16Cr 8Fe
Particle Size: -106 +45 µm (-140 +325 mesh)
Morphology: Water Atomized
Properties & Applications: Produces machinable "stainless" coatings useful for salvage and build-up applications on corrosion resistant steels, nickel, or nickel alloy substrates where high hardness is not required.

Metco 444

Chemistry: Ni 9Cr 5Al 5.5Mo 5Fe
Particle Size: -125 +45 µm (-120 +325 mesh)
Morphology: Clad
Properties & Applications: Coatings are self bonding, machinable. Excellent resistance to oxidation and corrosion.

OEM Specifications:

Honeywell Allied Signal EMS 52432, Class XXIX
Rolls-Royce Allison EMS 56762

AMDRY 960

Chemistry: (NiCr) 6Al
Particle Size: -125 +37 µm (-120 +400 mesh)
Morphology: Clad
Properties & Applications: ThermoSpray® coatings are not self bonding but can be used as abrasable coatings, for ceramics or to resist oxidation and corrosion. Recommended for resistance to oxidation and corrosion at high temperatures. Applications: Salvage and build-up of worn or mis-machined nickel, nickel alloy or machinable corrosion resistant steel parts. Coatings can also be used as undercoats for ceramics.

OEM Specifications:

Canada Pratt Whitney CPW 369
GE B50TF119 Class A
Honeywell M3956
MTU MTS 1077
Pratt Whitney PWA 1347
Rolls-Royce MSRR 9507/14
SNECMA DMR 33.018
Turbomeca LA 657 Ed.1, PC.2, Ind. 0
Williams WIMS 646

Combustion Powder Spray / Metals, Alloys, Composites and Blends / Nickel Base (continued)

Metco 443NS

Chemistry: (NiCr) 6Al
 Particle Size: 125 +45 µm (-120 +325 mesh)
 Morphology: Clad
 Properties & Applications: ThermoSpray® coatings are not self bonding but can be used as abradable coatings, for ceramics or to resist oxidation and corrosion. Recommended for resistance to oxidation and corrosion at high temperatures. Applications: Salvage and build-up of worn or mis-machined nickel, nickel alloy or machinable corrosion resistant steel parts. Coatings can also be used as undercoats for ceramics.

OEM Specifications:

Canada Pratt Whitney CPW 369
 GE B50A890
 GE B50TF119, Class A
 Honeywell M3956
 Honeywell Allied Signal EMS 57748
 Honeywell Allied Signal FP 5045, Type XVIII
 MTU MTS 1077
 Pratt Whitney PWA 1347
 Rolls-Royce MSRR 9507/14
 Rolls-Royce Allison EMS 56772
 SNECMA DMR 33.018
 Volvo PM 819-47
 Williams WIMS 646

Metco 461NS

Chemistry: Ni 17.5Cr 5.5Al 2.5Co 0.5Y₂O₃
 Particle Size: -150 +22 µm (-100 mesh +22 µm)
 Morphology: Clad
 Properties & Applications: Coatings are self bonding, oxidation and corrosion resistant. For use below 980°C (1800°F). Recommended for salvage and repair, and as bond coats for thermal barrier coatings systems.

Metco 442

Chemistry: Ni 8.5Cr 7Al 5Mo 2Si 2B 2Fe 3TiO₂
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Clad
 Properties & Applications: Hard "stainless" type, self-bonding coatings with excellent wear resistance and very good corrosion and oxidation resistance.

OEM Specifications:

Honeywell Allied Signal FP 5045, Type XXIII

EU AMDRY 350C

Chemistry: Ni 50Cr
 Particle Size: -106 +38 µm (-140 +400 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Coatings have higher corrosion resistance than 20% Cr materials. Used to combat fire-side corrosion of boiler tubes in fossil fuel power plants and can also be used as a corrosion resistant bond coat..

Metco 447NS

Chemistry: Ni 5Mo 5.5Al
 Particle Size: -90 +45 µm (-170 +325 mesh)
 Morphology: Clad
 Properties & Applications: General purpose material for producing medium hard coatings for hard bearing and wear resistance applications. Coatings are self bonding, extremely tough and capable of exhibiting good erosion and impact resistance. Can be used to protect parts such as machine elements, bearing seats and valves.

OEM Specifications:

Dana Perfect Circle PC 110-265
 GE B50TF166, Class A
 Honeywell M3961
 Honeywell Allied Signal EMS 57749
 Honeywell Allied Signal FP 5045, Type XVI
 Volvo PM 819-24
 Williams WIMS 645

Combustion Powder Spray / Cermets

Cermets are blends of metals and metal oxide ceramics. The main use of these cermets is in thermal barrier or thick clearance control applications where thermal expansion mismatch between the substrate and the coating must be controlled. Cermets are usually intermediate coating layers that are applied between the bond coat and ceramic top coat. Originally designed for turbine applications, they can be used in applications where severe thermal cycling can cause issues for other coating systems.

Metco 410NS

Chemistry: Al_2O_3 30(Ni 20Al)

Particle Size: -90 +15 μm (-170 mesh +15 μm)

Morphology: Blend

Properties & Applications: Coatings are denser, stronger, more abrasion and shock resistant than

pure ceramics, and are very hard and smooth.

OEM Specifications:

GE B50A888 & B50TF64, Class A

SNECMA DMR 33.081

Volvo PM 819-31

Combustion Powder Spray / Carbide Powders / Chrome Carbide

Chrome Carbide materials are typically used for higher temperature applications than materials of the tungsten carbide family, with a recommended service temperature range that is generally from 540 to 815 °C (1000 to 1500 °F). The presence of nickel and chromium prevents chromium carbide decomposition during spraying (carbon loss) and also serves as a matrix to improve overall coating integrity, corrosion resistance and wear resistance. Coatings of these materials can effectively combat solid particle erosion (SPE), high temperature wear (abrasion, erosion, fretting and cavitation) and hot corrosion. Service life and performance is moderate using the combustion powder spray process. For longer service life or use on critical components, coating materials applied using air plasma or HVOF spray processes are recommended.

Metco 430NS

Chemistry: Cr_3C_2 7(Ni 20Cr) Self-Fusing Nickel Alloy
 Particle Size: -53 +11 μm (-270 mesh +11 μm)
 Morphology: Blend
 Properties & Applications: Coatings are recommended for resistance to wear by abrasive grains, hard surfaces, fretting and particle erosion at temperatures between 540-815°C (1000-1500°F).

OEM Specifications:

GE B50TF28, Class A
 Jet Avion JA 13006
 Parker Hanefin ES6-423
 Rolls-Royce MSRR 9507/34
 SNECMA DMR 33.014
 Volvo PM 819-36

Combustion Powder Spray / Carbide Powders / Tungsten Carbide

Tungsten Carbide materials are generally recommended for wear applications with service temperatures of less than 500 °C (930 °F), as higher temperatures will result in the formation of brittle phases that reduce wear resistance and coating integrity. Chemistry, manufacturing process, individual carbide size and spray process are critical to overall performance, as is application tribology. Typical wear applications include erosion (low angle), abrasion, fretting, sliding wear and impact resistance. Matrixes of higher cobalt levels improve coating toughness. Powder selection and spray process is important for applications with specific surface finish requirements, such as smooth as-sprayed surfaces, fine ground and finished surfaces or super finishes. Service life and performance is moderate using the combustion powder spray process. For improved performance, use on critical components or applications requiring improved surface finishes, coating materials applied using air plasma or HVOF spray processes are recommended.

Metco 76F-NS

Chemistry: WC 20Co
Particle Size: -53 +11 µm (-270 mesh +11 µm)
Morphology: Sintered
Properties & Applications: Coatings are very dense and can be applied up to 0.05" thick (1.270 mm). Suitable for combustion spraying.

AMDRY 5670

Chemistry: WC 20Co
Particle Size: -90 + 45µm (-170 mesh +325)
Morphology: Sintered
Properties & Applications: Coatings are very coarse and recommended for traction or gripping applications (i.e. winder rolls). Suitable for combustion spraying.

Combustion Powder Spray / Ceramic Powders / Aluminum Oxide

Alumina is a wear resistant metal oxide ceramic that is chemically inert and stable at high temperatures. Key functions are for abrasive, sliding and erosive wear in applications where impact is not an issue. Medium to coarse grades can be used as a cutting medium such as knife edge seals in turbine applications. High purity grades (white alumina) exhibit excellent dielectric characteristics. Blends with small to moderate amounts of titanium oxide increase overall coating toughness. Good performance can be obtained for many applications using combustion powder spray. For critical applications or those where a smoother surface finish is required, air plasma sprayed materials should be considered.

Metco 105SFP

Chemistry: 99.5+ Al_2O_3
 Particle Size: -31 +3.9 μm
 Morphology: Angular / Blocky, Fused and Crushed
 Properties & Applications: Has the highest dielectric strength of all aluminum oxide coatings. Excellent refractory properties.

Metco 105NS

Chemistry: 98+ Al_2O_3
 Particle Size: -45 +15 μm (-325 mesh +15 μm)
 Morphology: Angular / Blocky, Fused and Crushed
 Properties & Applications: Dense coatings which resist wear by fibers and threads and also resist erosion in high temperatures ranging from 840 - 1650°C (1550 - 3000°F).

OEM Specifications:

Canada Pratt Whitney CPW 210
 Pratt Whitney PWA 1310
 Rolls-Royce MSRR 9507/9
 Rolls-Royce Allison EMS 56758
 SNECMA DMR 33.080
 Williams CWIMS 765

Metco 105SF

Chemistry: 98+ Al_2O_3
 Particle Size: -25 +5 μm
 Morphology: Angular / Blocky, Fused and Crushed
 Properties & Applications: Dense coatings which resist wear by fibers and threads and also resist erosion in high temperatures ranging from 840 - 1650°C (1550 - 3000°F).

Metco 101NS

Chemistry: Al_2O_3 3TiO₂
 Particle Size: -45 +11 μm (-325 mesh +11 μm)
 Morphology: Angular / Blocky, Fused and Crushed
 Properties & Applications: Good resistance to abrasive wear, sliding wear, friction and oxidation up to approx. 1100°C (2040°F). Coatings are particularly suitable for applications in the textile or synthetic fiber manufacturing industries, where surface resistance is required on parts used for the guiding and handling of thread. Can be used in many environments including most acids and alkalis.

OEM Specifications:

Boeing BMS 10-67, Type III
 GE A50TF87
 Rolls-Royce MSRR 9507/36
 SNECMA DMR 33.020
 Volvo PM 819-11

Metco 130

Chemistry: Al_2O_3 13TiO₂
 Particle Size: -53 +15 μm (-270 mesh +15 μm)
 Morphology: Clad
 Properties & Applications: Can be used for applications similar to Alumina / 3% Titania coatings, but have a lower dielectric strength and are less resistant to chemical attack. 550°C (1020°F) service temperature.

OEM Specifications:

Williams WIMS 649

Combustion Powder Spray / Ceramic Powders / Aluminum Oxide (Continued)**Metco 131VF**

Chemistry: Al_2O_3 40 TiO_2
Particle Size: -45 +5 μm (-325 mesh +5 μm)
Morphology: Spheroidal, Spray Dried
Properties & Applications: Good abrasive wear resistance and erosion resistance below 550°C (1020°F). Lower wear resistance; better grindability than coatings containing less titania. Polished coatings are used in chemical industry because of their low degree of wettability for dilute solutions of common acids. Used for thread guides to resist abrasive fibers.

Combustion Powder Spray / Ceramic Powders / Titanium Oxide

Titanium oxide and its alloys produce coatings that are generally tougher, but with lower hardness, than coatings of alumina. Applications for titanium oxide based coatings are sliding wear resistance where lubricity is needed. Coatings should not be used at service temperatures that exceed 540 °C (1000 °F) to avoid potential cracking as a result of phase transformation. Higher concentrations of chromium oxide or alumina will increase the wear resistance of titanium oxide. Air plasma spray produces higher quality, denser coatings that can be ground to smoother finishes than those produced using combustion powder spray.

Metco 102

Chemistry: TiO_2 99%
 Particle Size: -88 +7.8 μm (-170 mesh + 7.8 μm)
 Morphology: Angular / Blocky, Fused and Crushed
 Properties & Applications: Moderate abrasive wear resistance. Lower hardness than alumina / titania coatings. Soluble in alkalis and sulfuric acid, but resistant to attack in many other environments. Slightly conductive; static electricity does not build up on the coating surface.

Metco 111

Chemistry: TiO_2 45 Cr_2O_3
 Particle Size: -125 +7.8 μm (-120 mesh + 7.8 μm)
 Morphology: Blend
 Properties & Applications: Produces hard coatings with excellent resistance to abrasion, wear, heat and corrosion. Applications: dry cell battery core mandrels and drum doctor blades.

Combustion Powder Spray / Ceramic Powders / Zirconium Oxide

Zirconia based ceramics are used in heat insulation applications to improve efficiency and service life of components in high temperature service. These materials are generally applied over an appropriate bond coat. For best performance results, air plasma spray is recommended. Yttria is alloyed with the zirconia to help minimize phase transformation that can cause volume changes within the coating, which can lead to coating spallation and cracking during service. Key applications are gas turbine hot section components, diesel engine piston crowns and seats.

Sulzer Metco 6600

Chemistry: $\text{ZrO}_2 \cdot 8\text{Y}_2\text{O}_3$
Particle Size: $-75 +15 \mu\text{m}$ (-200 mesh $+15 \mu\text{m}$)
Morphology: Spheroidal, HOSP™
Properties & Applications: Finer particle size for dense wear resistant applications. Smoother surface textures. Recommended for plasma extension guns, ID and combustion spraying.

Combustion Powder Spray / Self-Fluxing Powders / Cobalt Base

These alloys contain boron and silicon as temperature suppressants that allow these materials to be fused (remelted) in normal atmospheres after the coating is applied. The fusing procedure coalesces the coating into an essentially pore-free, fully dense surface that is metallurgically bonded to the substrate. Coatings are typically fused by oxy-acetylene touches, furnace or induction. Cobalt based self-fluxing alloys exhibit very high hot hardness having greater impact resistance and better ductility than nickel-based alloys. They are also less prone to cracking during post-fusing cooling. Coatings of this type are quite suitable for application using combustion powder spray.

Metco 18C

Chemistry: Co 27Ni 18Cr 6Mo 3.5Si 3B 2.5Fe 0.2C
 Particle Size: -125 +53 μm (-120 +270 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Used for hardfacing substrates of 400 series stainless steel and other low shrink materials. Coatings are hard and resistant to wear by abrasive grains, hard surfaces, fretting, cavitation and particle erosion. High hot hardness.

OEM Specifications:

Rolls-Royce MSRR 9507/39 (*made to order only as Metco 18C-NS*)
 SMUK DTD900-4950 (*made to order only as Metco 18C-NS*)

Combustion Powder Spray / Self-Fluxing Powders / Nickel Base

These alloys contain boron and silicon as temperature suppressants that allow these materials to be fused (remelted) in normal atmospheres after the coating is applied. The fusing procedure coalesces the coating into an essentially pore-free, fully dense surface that is metallurgically bonded to the substrate. Coatings are typically fused by oxy-acetylene touches, furnace or induction. Proper (slow) cooling is critical to prevent cracking. The resulting coatings have high impact resistance and generally exhibit high hot hardness, low ductility and high thermal expansion coefficients. Industries commonly using these coatings are agriculture and glass moulding. Coatings of this type are quite suitable for application using combustion powder spray.

Metco 12C

Chemistry: Ni 10Cr 2.5B 2.5Fe 2.5Si 0.15C
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Only self-fluxing alloy which produces a machinable fused coating. Recommended for resistance to wear by abrasive grains, hard surfaces, fretting, cavitation, and erosion at both low and high temperatures to 840°C (1550°F).

EU Metco 14E

Chemistry: Ni 14Cr 4Fe 3.3Si 2.8B 0.6C
 Particle Size: -106 +45 µm (-140 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Produces chip-resistant self-fluxing coatings. Resistant to wear from abrasive particles, contact against hard surfaces, friction, cavitation and erosion at service temperatures up to 540° C (1000° F).

Metco 15E

Chemistry: Ni 17Cr 4Fe 4Si 3.5B 1C
 Particle Size: -106 +45 µm (-140 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Coatings are very dense and corrosion resistant. Recommended for the most severe service requirements when used on base materials with a fairly high coefficient of thermal expansion.

Metco 15F

Chemistry: Ni 17Cr 4Fe 4Si 3.5B 1C
 Particle Size: -53 +15 µm (-270 mesh +15µm)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Coatings are very dense and corrosion resistant. Recommended for the most severe service requirements when used on base materials with a fairly high coefficient of thermal expansion.

OEM Specifications:

Honeywell Allied Signal FP 5045, Type XIX

EU Metco 20

Chemistry: Ni 17Cr 4Fe 4.5Si 3.5B 0.6C
 Particle Size: -90 +45 µm (-170 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Produces very thick, corrosion-resistant coatings. Recommended for protection against wear resulting from abrasive particles, contact with hard surfaces, friction, cavitation and erosion at temperatures up to 540° C (1000° F)..

Combustion Powder Spray / Self-Fluxing Powders / Nickel Base (Continued)

Metco 16C

Chemistry: Ni 16Cr 4Si 4B 3Cu 3Mo 2.5Fe 0.5C
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Coatings are resistant to wear by abrasive grains, hard surfaces, particle erosion, fretting and cavitation.

OEM Specifications:

Honeywell Allied Signal FP 5045, Type III, P/N 3181458
 Rolls-Royce MSRR 9507/7

Metco 19E

Chemistry: Ni 16Cr 4Si 4B 4Fe 2.4Cu 2.4Mo 2.4W 0.5C
 Particle Size: -106 +45 µm (-140 +325 mesh)
 Morphology: Spheroidal, Gas Atomized
 Properties & Applications: Can be used in the as-sprayed or fused condition. Coatings are dense, hard and essentially oxide free. Very dense self-fluxing alloy coatings. Readily coalesce during fusing. Resistant to abrasive grains, hard surfaces, cavitation, particle erosion and fretting. Offers the best corrosion resistance of all the self-fluxing alloys. Applications: cam followers, wear rings and utility exhaust fans.

Metco 36C

Chemistry: Ni 35 (WC 8Ni) 11Cr 2.5B 2.5Fe 2.5Si 0.5C
 Particle Size: -150 +45 µm (-100 +325 mesh)
 Morphology: Blend
 Properties & Applications: The most wear resistant of the self-fluxing coatings. The WC particles in this material are large, blocky and unaffected by the heat of fusing. Essentially cobalt free for stain resistance.

Metco 31C-NS

Chemistry: Ni 35 (WC 12Co) 11Cr 2.5Fe 2.5Si 2.5B 0.5C
 Particle Size: -125 +45µm (-120 +325 mesh)
 Morphology: Blend
 Properties & Applications: Post-fuse coatings are erosion, abrasion and fret resistant. Applications: knives and cutting edges for agriculture.

Metco 32C

Chemistry: (WC 12Co) 14Ni 3.5Cr 0.8B 0.8Fe 0.8Si 0.1C
 Particle Size: -125 +45 µm (-120 +325 mesh)
 Morphology: Blend
 Properties & Applications: Coatings are capable of in service temperatures to 540°C (1000°F) and are extremely wear resistant to abrasive grains, hard surfaces, fretting and particle erosion.

Metco 34F

Chemistry: (WC 12Co) 33Ni 9Cr 3.5Fe 2Si 2B 0.5C
 Particle Size: -53 +15 µm (-270 mesh +15 µm)
 Morphology: Blend
 Properties & Applications: Especially developed to produce thin, hard, dense and smooth coatings. Coatings can be used in the unfused state.

Metco 34FP

Chemistry: (WC 12Co) 33Ni 9Cr 3.5Fe 2Si 2B 0.5C
 Particle Size: -53 +15 µm (-270 mesh +15 µm)
 Morphology: Blend
 Properties & Applications: Especially developed to produce thin, hard, dense and smooth coatings. Coatings can be used in the unfused state.