Eutalloy® Thermal Spray Alloys

Alloys for Use with the SuperJet-S Eutalloy

Castolin Eutectic®
Eutectic Castolin

Eutalloy® Process - One step Spray & Fuse

Basic Principles of Eutalloy® process

Function

The powder is introduced into the torch flame and sprayed in a semi-molten state onto the preheated part, for fusion. Bonding is achieved by diffusion of the alloys into the base metal.

Bonding of the coating alloy and base metal is similar to that obtained in brazing: a liquid phase is linked with a solid phase, by diffusion. The wetting qualities of alloys are due to the synergistic nature of certain constituents. These resist oxide formation on the substrate surface during spraying, and promote bonding with the base metal. An oxide-free surface is essential. Melting ranges, depending on the type of alloy, vary between 1562°F (850°C) and 2012°F (1100°C). Spraying distances vary between 6 and 20 mm.

Metallurgical bonding with no dilution of Eutalloy® alloy, on stainless steel (enlarged x 500).

A) Deposit

B) Diffusion zone

C) Base metal

Advantages

Eutalloy® provides a wide range of benefits compared with conventional arc welding process and PTA processes:

- No dilution of the base material
- Best purity and performance of the coating alloy
- Homogeneous and pore free coatings
- Smooth surface for low post welding machining and also when compared with cold thermal spraying
- Higher bond strength
- Better shock resistance
- Thicker coatings capabilities

Applications

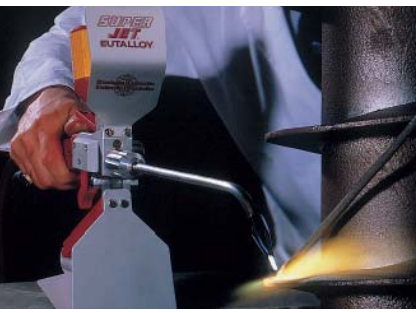
The Eutalloy® process is designed for protective coating of machine parts and tools subject to a variety of wear phenomena. Eutalloy®-type oxy acetylene torches are capable of delivering a wide range of alloys in powder form. The Eutalloy® system has a coating dimension range from 0.10 mm to thicknesses of several millimeters. The spraying followed by fusion method can fine-coat to 0.05 mm. The hardness of a deposit can vary from 15 to 65 HRC, depending on the alloy composition. Such deposits are perfectly homogeneous and dense.

Technical data

- Flame temp.: 5792°F (3200 °C)
- Particle velocity: not relevant
- Deposition rate: 0.55 to 1.66 g/s
- Coating material: Self-fluxing Ni, Co or Fe base in powder form
- Coating thickness: 0.05 to 10 mm
- Coating density: 100%
- Noise level: 70 - 80 dB(A)

Powder Flame Spray-Fusing

Eutalloy® Powders

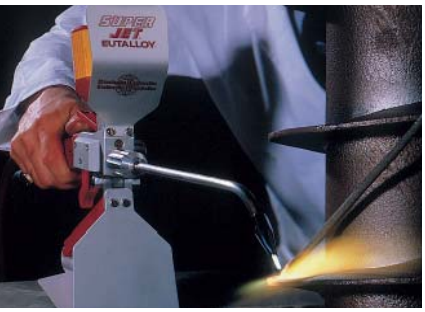



Eutalloy Powders - 10XXX Series

Designations	Product Type / Max Service Temp.	Properties	Applications
Eutalloy® 10009	Ni-Cr-B-Si-Fe alloy / 1020°F (550°C)	~61 HRc.Low friction coefficient. Good resis-tance to corrosion, erosion and abrasion under light load. ASTM G65 Wear 20 mm^3 loss	Resurfacing cams, pushers, stops, guide wheels, filterpress cake stone remover for sugar mill, decanting screw, steam gate components. Coating elements subject to friction.
Eutalloy® 10011	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1020°F (550°C)	~65 HRc.80% tungsten carbides.Excellent resistance to abrasion by fine to coarse sized abrasives. ASTM G65 Wear 8 mm^3 loss.	Coating elements of chains, transport screw, wiper segments, brick die frames, claw excavators, rock drill, brush cutter rake, debarking knives
Eutalloy® 10020	Ni-Cu alloy / 1200°F (650°C)	~18 HRc Ni-Cu alloy coating that is resistant to corrosion, particularly salt corrosion, and galling. Deposits are non-magnetic.	Control valves and seats, die plates, sea water pumps, oil components sensitive to magnetism, cushion layer for non-mag hardfacing alloys, etc.
Eutalloy® 10092	Co-Ni-Cr-B-Si-W alloy / 1550°F (845°C)	~48 HRc cobalt-base coating that will resist softening and scaling at elevated temperatures. Alloying additions of chromium and tungsten insure good hot hardness properties. ASTM G65 Wear 30 mm^3 loss	Exhaust valves and seats, hot punches, ingot tongs, drawing blocks, step tips, water-cooled pokers, wire draw blocks, impeller, etc
Eutalloy® 10112	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1020°F (550°C)	~64 HRc.60% tungsten carbides.Excellent resistance to erosion and abrasion by fine to coarse sized abrasives. ASTM G65 Wear 12 mm^3 loss.	Coating of machine parts used in the transport, handling and processing of minerals: transport screws, clay mixers, dies, segments, wipers, turbine impeller, fan impeller, pump screw, etc.
Eutalloy® 10146	Cu-Sn-Ni alloy / 700°F (370°C)	~30 HRb A copper-tin-nickel powder for joining and build-up on copper-base alloys. Deposits are readily machined with standard HSS tool bits.	Shafts, Gears, Gauges Slideways, Beds, Molds, Keyways, etc.
Eutalloy® 10180	Cu-P alloy / 700°F (370°C)	A Copper-phosphorus alloy for joining & build-up on copper-base alloys. Deposits are smooth can be machined (when necessary) using standard HSS tool bits.	Plumbing Fixtures, Bus Bars, Coils, Evaporators, Tanks, Kettles, etc.
Eutalloy® 10185	Ni-B-Si alloy / 1200°F (650°C)	~42 HRc.Well suited for metal-to-metal fric-tion.Excellent corrosion resistance.Machinable with cutting tool.	Coating of cast iron and steel molds for plastic material and glass.Recoating shafts, eccentrics, bearings, brazing tungsten carbide inserts on drilling stabilizers
Eutalloy® 10224	Ni-B-Si alloy / 1000°F (590°C)	~90 HRb. Appropriate for new or worn cast iron. Good resistance to corrosion. Machinable with cutting tool.	Repairing glass mold edges, gear teeth, exhaust manifolds, pump bodies, brakes on drawing tools, engine block crack repair, etc. Bonding layer before welding with electrode on cast iron that is difficult to weld
Eutalloy® 10680	Ni-B-Si alloy / 1200°F (650°C)	~95 HRb.Good resistance to shocks and oxida-tion while hot.High shear strength nickel-base alloy for cladding, joining and sealing steels, stainless steels and nickel-base metals. Coatings have high build-up capability. Machinable with cutting tool.	Repair of gears, cast iron valve seats, molds, keyways, bearing seating, foundry defects, renewing drawing tools, correction of machining errors
Eutalloy® 10999N	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1020°F (550°C)	~60 HRc.Blend of a nickel-base fusible alloy plus 20% cast and crushed tungsten carbide particles. The coatings offer exceptional resistance to abrasion and wear by friction. Finish by grinding. ASTM G65 Wear 18 mm^3 loss	Coating of molds for ceramics, mixer paddles, screw flights, auger points, conveyor chains, drill bits

Powder Flame Spray-Fusing

Eutalloy® Process - One step Spray & Fuse




Eutalloy Powders - 11XXX Series

Designations	Product Type / Max Service Temp.	Properties	Applications
Eutalloy® 11490	Ni-B-Si alloy / 1200°F (650°C)	~95 HRb. Similar to 10680. High shear strength nickel-base alloy for cladding, joining and sealing steels stainless steels and nickel-base metals. Coatings have high build-up capability. Finish by machining.	Repair of gears, cast iron valve seats, molds, keyways, bearing seating, foundry defects, renewing drawing tools, correction of machining errors
Eutalloy® 11493	Ni-B-Si alloy / 1200°F (650°C)	~42 HRc. Similar to 10185. Offers the best combination of hardness and wear resistance coupled with good machining properties. Coatings have unlimited build-up capability and can be machined with carbide tool bits.	Coating of cast iron and steel molds for plastic material and glass.Recoating shafts, eccentrics, bearings, gears, feed rolls, brazing tungsten carbide inserts on drilling stabilizers
Eutalloy® 11494	Ni-Cr-B-Si-Fe alloy / 1020°F (550°C)	~38 HRc. An intermediate hardness alloy with a good combination of hardness and wear resistance coupled with good machining properties. Coatings have unlimited build-up capability and can be machined with carbide tool bits	Shafts, Gears, Tools, Gauges, Feed Rolls, Molds, Keyways
Eutalloy® 11496	Ni-Cr-B-Si-Fe alloy / 1020°F (550°C)	~61 HRc. Similar to 10009. Hard, nickel-base alloy with excellent wear properties. Coatings are resistant to abrasion, erosion and adhesive wear. Eutectic 11496 coatings produce a smooth wear scar during use that improves service life. Finish by grinding. ASTM G65 Wear 20 mm^3 loss	Resurfacing cams, pushers, stops, guide wheels, filterpress cake stone remover for sugar mill, decanting screw, steam gate components. Coating elements subject to friction.
Eutalloy® 11497	Ni-B-Si alloy / 1200°F (650°C)	~25 HRc.A low-to-medium hardness alloy with a good combination of impact and wear resistant properties. Excellent machining properties. Coatings have unlimited build-up capability and can be machined with carbide tool bits.	Repair of gears, cast iron valve seats, molds, keyways, bearing seating, renewing drawing tools, correction of machining errors.
Eutalloy® 11498	Ni-B-Si alloy / 1000°F (590°C)	~90 HRb. Similar to 10224. A nickel-base fusible alloy designed for sealing, cladding, filling and joining cast irons. Alloying additions insure good wettability and high ductility. Finish by machining.	Repairing glass mold edges, gear teeth, exhaust manifolds, pump bodies, brakes on drawing tools, engine block crack repair, etc. Bonding layer before welding with electrode on cast iron that is difficult to weld, etc.

Eutalloy® Process - One step Spray & Fuse

Eutalloy Powders - 12XX Series

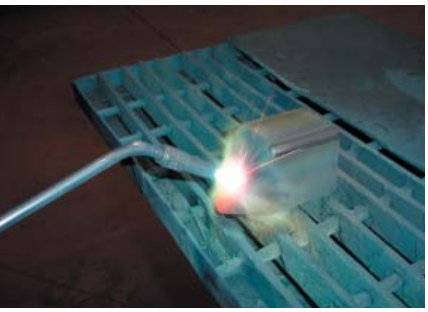
Designations	Product Type / Max Service Temp.	Properties	Applications
Eutalloy® 1202	Ni-B-Si alloy / 1000°F (590°C)	90-100 HRb. A nickel-base fusible alloy designed for sealing, cladding, filling and joining cast irons. Excellent build up properties with reduced overspray. Easily hand-worked.Finish by machining.	For repairing glass mold corners and edges, including mold necks and bases.
Eutalloy® 1203	Ni-B-Si alloy / 1000°F (590°C)	87-94 HRb. A slightly less-hard nickel-base fusible alloy designed for sealing, cladding, filling and joining cast irons. Excellent build up properties with reduced overspray. Easily hand-worked.	For repairing glass mold corners and edges, including mold necks and bases, funnels rings, etc.
Eutalloy® 1204	Ni-B-Si alloy / 1000°F (590°C)	~31 HRc. Specially formulated nickel-base fusible alloy designed for optimized surface finishing. Good for cladding, filling and joining cast irons. Excellent build up properties with reduced overspray.	For repairing glass mold corners and edges, including mold necks and bases…
Eutalloy® 1205	Ni-B-Si alloy / 1000°F (590°C)	20-27 HRc. A mid-range hardness alloy with excellent puddle control with a good combination of wear resistant properties. Excellent machining properties. Coatings have unlimited build-up capability and can be machined with carbide tool bits.	Mold necks, mold edges & corners, bottom plates and guide rings…
Eutalloy® 1206	Ni-B-Si alloy / 1000°F (590°C)	90-96 HRb. A specially formulated nickel-base fusible alloy designed for coating preheated mold necks. Excellent for sealing, cladding, filling and joining cast irons. Excellent build up properties with reduced overspray. Easily hand-worked.	For repairing mold necks & edges, including Press & Blow plungers, guide rings and bottom plates…
Eutalloy® 1210	Ni-B-Si alloy / 1000°F (590°C)	25-27 HRc. Unique mid-range hardness alloy with exceptional wettability and point-to-point deposition control. Coatings have unlimited build-up capability and can be machined with carbide tool bits.	Mold edges & corners especially when used on bronze-type alloys…

Eutalloy Powders - LT84XX Series

Designations	Product Type	Properties	Applications
Eutalloy® LT PE 8418	Self-fluxing, nickel base alloy	~ 240 HV30 (~18 HRC). Low energy input for the fusion.Spot repairs.	Repair of mould damage on the seams or edges. Easy to machine or file.
Eutalloy® LT PE 8422	Self-fluxing, nickel base alloy	~ 270 HV30 (~22 HRC). Low energy input for the fusion.Small to medium repairs.	Repair or protection of mould compo-nents: seams, blow heads, guide rings.
Eutalloy® LT PE 8426	Self-fluxing, nickel base alloy	~26 HRC (~300 HV30). Low energy input for the fusion. Fast deposition.	Brazing of tungsten carbides on stabiliz-ers. Extensive repairs and preventive coat-ings on seams, edges and guides.
Eutalloy® LT PE 8431	Self-fluxing, nickel base alloy with addition of Cr and Mo	~31 HRC Low energy input for the fusion.Good wetting properties and fast.	Fast repairs and extensive preventive coatings on mould edges and guides.
Eutalloy® LT PE 8435	Self-fluxing, nickel base alloy with addition of Cr and Mo	~35 HRC Low energy input for the fusion.Enhanced fluidity and fast.	Extensive repairs and preventive coatings on neck rings or blow head.
Eutalloy® LT PE 8440	Self-fluxing, nickel base alloy with addition of Cr and Mo	~40 HRC Low energy input for the fusion.Fast deposition with enhanced fluidity.	Enhanced weldability at high hardness level on bottom plates, baffles and guide plates.

Powder Flame Spray-Fusing

Eutalloy® Powders




Eutectic Powders - 9XXX Series

Designations	Product Type / Max Service Temp.	Properties	Applications
Eutectic® 9001	Ni-B-Si alloy / 1050°F (565°C)	~25 HRc. A medium hardness alloy specifically developed to reduce overspray with improved fluidity and machinability. Formulated for both cast irons & bronze alloys. Readily machined with standard tool bits.	Guide rings and bottom plates
Eutectic® 9002	Ni-B-Si alloy / 1050°F (565°C)	~15 HRc. A low hardness alloy specifically developed to reduce overspray with improved fluidity and machinability. Formulated for both cast irons & bronze alloys. Readily machined with standard tool bits.	Finish neck rings and molds.
Eutectic® 9003	Ni-B-Si alloy / 1050°F (565°C)	~18 HRc. A soft-to-medium hardness alloy specifically developed to reduce overspray with improved fluidity and machinability. Formulated for both cast irons & bronze alloys. Readily machined with standard tool bits.	Finish neck rings and molds…
Eutectic® 9005	Ni-B-Si alloy / 1050°F (565°C)	35-40 HRc. An intermediate hardness alloy with a good combination of hardness and wear resistance coupled with good machining properties. Coatings have unlimited build-up capability and can be machined with carbide tool bits.	Press & blow and blow & blow plungers, baffles…

Eutalloy Powders - CP Series

Designations	Product Type / Max Service Temp.	Properties	Applications
Eutalloy® CPW 5127	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1200°F (760°C)	~59 HRc. Blend of a nickel-base fusible alloy plus 50% cast and crushed tungsten carbide particles. Has higher fluidity when compared to TungTec 10112. The coating offers exceptional resistance to abrasion and erosion. Finish by grinding. ASTM G65 Wear 16 mm^3 loss	Coating of machine parts used in the transport, handling and processing of minerals: transport screws, clay mixers, dies, segments, wipers, turbine impeller, fan impeller, pump screw,
Eutalloy® CPW 5057N	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1200°F (760°C)	~59 HRc. Blend of a nickel-base fusible alloy plus 45% cast and crushed tungsten carbide particles. Has higher fluidity when compared to TungTec 10112. The coating offers exceptional resistance to abrasion and erosion. Finish by grinding. ASTM G65 Wear 18 mm^3 loss	Coating of machine parts used in the transport, handling and processing of minerals: transport screws, clay mixers, dies, segments, wipers, turbine impeller, fan impeller, pump screw
Eutalloy® CPM 1249	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1200°F (760°C)	~59 HRc. Similar to 10112. A blend of a nickel-base fusible alloy plus 60% cast and crushed tungsten carbide particles. The coating offers exceptional resistance to abrasion and erosion. Finish by grinding. ASTM G65 Wear 12 mm^3 loss	Coating of machine parts used in the transport, handling and processing of minerals: transport screws, clay mixers, dies, segments, wipers, turbine impeller, fan impeller, pump screw, etc.

Eutalloy® Equipment

Eutectic Powders - 4XXX Series

Designations	Product Type / Max Service Temp.	Properties	Applications
Eutectic ® 4510	Ni-B-Si alloy / 1000°F (540°C)	~18 HRc. Similar to 10224. Nickel-base fusible alloy designed for sealing, cladding, filling and joining cast irons, stainless steels & nickel-base alloys. Alloying additions insure good wettability, high ductility and excellent machinability. Finish by machining.	Repairing mold edges, gear teeth, exhaust manifolds, pump bodies, brakes on drawing tools, engine block crack repair, etc. Bonding layer before welding with electrode on cast iron that is difficult to weld
Eutectic® 4520	Ni-Cr-B-Si-Fe alloy / 1020°F (550°C)	~61 HRc. Similar to 10009. Hard, nickel-base alloy with excellent wear properties. Coatings are resistant to abrasion, erosion and adhesive wear. Coatings produce a smooth wear scar in service. Finish by grinding. ASTM G65 Wear 20 mm^3 loss.	Resurfacing cams, pushers, stops, guide wheels, filterpress cake stone remover for sugar mill, decanting screw, steam gate components. Coating elements subject to friction.
Eutectic® 4530	Ni-B-Si alloy / 1200°F (650°C)	~42 HRc. Similar to 10185.A unique combination of hardness and wear resistance coupled with good machining properties. Coatings have unlimited build-up capability and can be machined with carbide tool bits to a very fine finishes.	Coating of cast iron and steel molds for plastic material and glass.Recoating shafts, eccentrics, bearings, brazing tungsten carbide inserts on drilling stabilizers
Eutectic® 4540	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1200°F (650°C)	~59 HRc. A nickel-base fusible alloy plus 45% cast and crushed tungsten carbide particles. Has excellent fluidity and are easier to finish when compared to X-TraLife 4550 The coating offers exceptional resistance to abrasion and erosion. Finish by wet grinding. ASTM G65 Wear 18 mm^3 loss. Similar to 5057N.	Coating of machine parts used in the transport, handling and processing of minerals: transport screws, clay mixers, dies, segments, wipers, turbine impeller, fan impeller, pump screw
Eutectic® 4550	Ni-Cr-B-Si-Fe alloy and tungsten carbide / 1200°F (650°C)	~59 HRc. Similar to 10112. A nickel-base fusible alloy plus 60% cast and crushed tungsten carbide particles. The coating offers exceptional resistance to abrasion and erosion. Finish by grinding. ASTM G65 Wear 12 mm^3 loss.	Coating of machine parts used in the transport, handling and processing of minerals: transport screws, clay mixers, dies, segments, wipers, turbine impeller, fan impeller, pump screw

SuperJet-S-Eutalloy®

SuperJet-S-Eutalloy® is an oxy-acetylene thermal spray torch, which delivers very precise anti-wear protective coatings, thanks to its sensitive controls. Alloy powders are sprayed onto the part to be coated and are fused simultaneously. Diffusion bonding with the base metal ensures that it does not reach its melting point. The dense coating is not affected by dilution and retains all its designed properties. For thermal spraying of Eutalloy® powders.

Advantages

- Flexible, multi purpose and fast
- Rapid shut-off of acetylene and oxygen while maintaining setting
- Reliable and precise coatings
- Usable in all positions on a wide range of base metals, including steels, alloy steels, stainless steels and cast-iron

SuperJet-S-Eutalloy® Kit

Contents of the equipment case:

- 1 torch with heat shield
- 6 tip assemblies for different flame sizes to be used according to the size of the part or type of coating required (refer to operating pressure table, p. 8)

Also included are Eutalloy® powders for a wide range of applications.

Accessories such as:

- adjustable spanner
- spark lighter
- welding goggles
- hose couplings
- set of nozzle cleaners *
- set of injector cleaners
- special screwdriver *
- cleaning rad *
- set of Teflon washers *

* packed in a plastic box

Stronger with... Eutectic

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Castolin Eutectic®
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Eutectic Corporation
N94 W14355 Garwin Mace Drive
Menomonee Falls, WI 53051 USA
P 800-558-8524 • F 262-255-5542
www.eutecticusa.com

Eutectic Canada
428, rue Aime Vincent
Vaudreuil-Dorion, Quebec J7V 5V5
Phone: (800) 361-9439
Fax: (514) 695-8793
www.eutectic-na.com

Eutectic Mexico
KM 36.5 Autopista
Mexico-Quertaro
54730 Cautitlan-Izcalli
Estado de Mexico, Mexico
Phone: 011 (52) 55-5872-1111
e-mail: eutectic@eutectic.com.mx

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