

Powder Spray Fusing

Eutalloy[®] - Eutalloy[®] SF

Enduring Performance...



*Stronger, with
Castolin Eutectic*

Castolin Eutectic[®]
Eutectic Castolin

Powder Spray Fusing



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Simplified overview

Coating families	Coating material	Base material	Heating of work-piece	Max coating thickness mm	Coating surface size	Coating structure	Coating micro-porosity	Bonding	Deposition rate	Deposition yield	Energy	Equipment investment
Eutalloy	Powder. Self-fluxing alloys	Steels, cast iron, (aluminium bronze)*	Medium to high	2 (10)*	Small & precise	Homogeneous	Negligible	Very good. Diffusion	Medium	Medium	Combustion gases	Low
Eutalloy SF	Powder. Self-fluxing alloys	Steels & cast iron	High	2 (6)*	Medium to large	Homogeneous	Negligible	Very good. Diffusion	High	High	Combustion gases	Low

■ **Best** ■ **Second choice**

(...)* request special precaution or coating powder

Powder Spray Fusing

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.



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

- A) Deposit
- B) Diffusion zone
- C) 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 850°C and 1100°C. Spraying distances vary between 6 and 20 mm.



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 millimetres. 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 temperature: 3200 °C
- Particle velocity: not relevant
- Deposition rate: 2 to 6 kg/h
- 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 Spray-Fusing

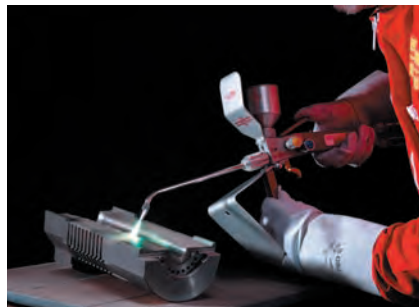
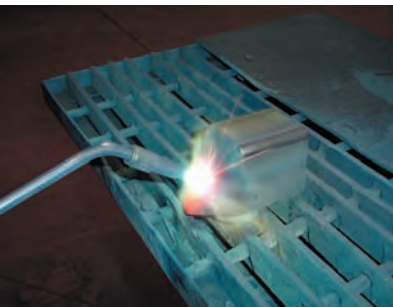
Eutalloy® Powders



Designations	Product Type	Applications	Properties
Eutalloy® 10009 Part N° / Esc Code 100603 10009 0.7 kg 100604 10009 3.5 kg	Alloy Ni-Cr-B-Si-Fe	Resurfacing cams, pushers, stops, guide wheels, filterpress cake stone remover for sugar mill, decanting screw, steam gate components. Coating elements subject to friction.	~63 HRC Low friction coefficient. Good resistance to corrosion, erosion and abrasion under light load.
Eutalloy® 10011 100605 10011 0.7kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	Coating elements of chains, transport screw, wiper segments, brick die frames, claw excavators, rock drill, brush cutter rake, debarking knives	~65 HRC 80% tungsten carbides. Excellent resistance to abrasion by fine to coarse sized abrasives
Eutalloy® 10112 100608 10112 0.7kg 103508 10112 12.5kg 100609 10112 3.5kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	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.	~64 HRC 60% tungsten carbides. Excellent resistance to erosion and abrasion by fine to coarse sized abrasives.
Eutalloy® 10185 100610 10185 0.7kg 100611 10185 3.5kg	Alloy Ni-B-Si	Coating of cast iron and steel molds for plastic material and glass. Recoating shafts, eccentrics, bearings Soldering tungsten carbide biscuits on drilling stabilizers, etc.	~390 HV30 Well suited for metal-to-metal friction. Excellent corrosion resistance. Machinable with cutting tool.
Eutalloy® 10224 100613 10224 0.7kg 103509 10224 12.5kg 100614 10224 3.5kg	Alloy Ni-B-Si	Repairing glass mold edges, gear teeth, exhaust manifolds, pump bodies, brakes on drawing tools. Bonding layer before welding with electrode on cast iron that is difficult to weld, etc.	~250 HV30 Appropriate for new or worn cast iron. Good resistance to corrosion. Machinable with cutting tool.
Eutalloy® 10611 100617 10611 0.7kg 100618 10611WS 12.5kg	Co-Ni-Cr-B-Si alloy and tungsten carbide	Resurfacing chemical transport screws, fan blades at cement works, augers, and extrusion screws. Blades and segments of mixers, etc.	~55 HRC 50% tungsten carbides. Excellent resistance to abrasion under pressure and to corrosion.
Eutalloy® 10680 100621 10680 0.7kg 100622 10680 3.5kg	Alloy Ni-B-Si	Repair of gears, cast iron valve seats, molds, keyways, bearing seating. Renewing drawing tools Correction of machining errors, etc.	~240 HV30 Good resistance to shocks and oxidation while hot. Machinable with cutting tool.
Eutalloy® 15999 202799 15999 0.7kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	Coating of molds for ceramics, rasps. Distributor blades for fertilizer spreaders, cyclone blades, hopper for sand spreading machines, mouths of baggers, etc.	~65 HRC 15% tungsten carbides. Excellent resistance to erosion and abrasion by fine abrasives.

Powder Spray-Fusing

Eutalloy® Powders



Designations	Product Type	Applications	Properties
Eutalloy® LT PE 8418 103398 4.5kg 103404 12.5kg	Self-fluxing, nickel base alloy	Repair of mould damage on the seams or edges. Easy to machine or file.	~ 240 HV30 (~18 HRC) Grain size -106 µm. Low energy input for the fusion. Spot repairs.
Eutalloy® LT PE 8422 103399 4.5kg 103405 12.5kg	Self-fluxing, nickel base alloy	Repair or protection of mould components: seams, blow heads, guide rings.	~ 270 HV30 (~22 HRC) Grain size -106 µm. Low energy input for the fusion. Small to medium repairs.
Eutalloy® LT PE 8426 103400 4.5kg 103406 12.5kg	Self-fluxing, nickel base alloy	Brazing of tungsten carbides on stabilizers. Extensive repairs and preventive coatings on seams, edges and guides.	~26 HRC (~300 HV30) Grain size -106 µm. Low energy input for the fusion. Fast deposition.
Eutalloy® LT PE 8431 103401 4.5kg 103407 12.5kg	Self-fluxing, nickel base alloy with addition of Cr and Mo	Fast repairs and extensive preventive coatings on mould edges and guides.	~31 HRC Grain size -106 µm. Low energy input for the fusion. Good wetting properties and fast.
Eutalloy® LT PE 8435 103402 4.5kg 103408 12.5kg	Self-fluxing, nickel base alloy with addition of Cr and Mo	Extensive repairs and preventive coatings on neck rings or blow head.	~35 HRC Grain size -106 µm. Low energy input for the fusion. Enhanced fluidity and fast.
Eutalloy® LT PE 8440 103403 4.5kg 103409 12.5kg	Self-fluxing, nickel base alloy with addition of Cr and Mo	Enhanced weldability at high hardness level on bottom plates, baffles and guide plates.	~40 HRC Grain size -106 µm. Low energy input for the fusion. Fast deposition with enhanced fluidity.

Powder Spray-Fusing Eutalloy® Equipment

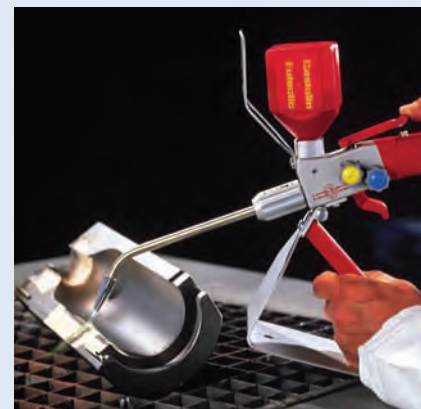


SuperJet-S-Eutalloy®

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



Part N° / Esc Code

750731 SuperJet-S- complete kit

Part N° / Esc Code

290102 SuperJet-S- kit with A1S, B3S and CSS

Other kits with different content are available on request. Please ask your local Castolin Eutectic company

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, page 6)

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

Alloy types: 10680 – 10009 – 10185 – 10112

Solution R 103 to protect the adjacent areas from undesirable overspray.

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

KoolTip



Part N° / Esc Code

203867 KoolTip C6S kit

Special water cooled tip assemblies called KoolTip® kits are recommended whenever the SuperJet -S- torch is subject to high duty cycle usage or prolonged thermal reflections.

C6 water-cooled tip assembly kit contents:

- assembly with cooling device
- set of connecting water hoses
- special heat shield

Accessories such as:

- spark lighter
- welding goggles
- nozzle cleaner *
- injector cleaner *
- set of Teflon washers *

* packed in a plastic box.

Powder Spray-Fusing

Eutalloy® Accessories

Accessories for SuperJet-S-Eutalloy®



Part N° / Esc Code

205077 Refill Powder Container

Refill Powder Container

An aluminium refill container may be mounted onto the torch when powder alloys need to be transferred from bulk packages. Refilling is easily executed via the lid without removing the container.



Part N° / Esc Code

290129 A0S

290130 A1S

290131 A2S

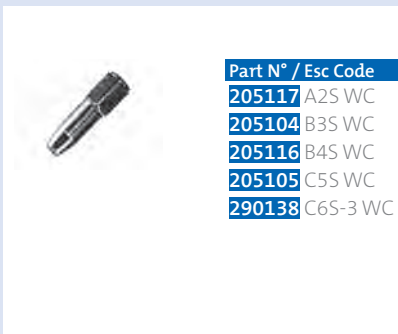
290132 B3S

290133 B4S

290134 C5S

Nozzles

This nozzle is made out of highly Cu with structural hardening, a special wear resistant copper alloy which improves service life. It can be screwed on & off easily. Every standard kit is delivered with this nozzle type.



Part N° / Esc Code

205117 A2S WC

205104 B3S WC

205116 B4S WC

205105 C5S WC

290138 C6S-3 WC

Heavy duty Nozzles

Reinforced with Tungsten-Carbide

This nozzle can be supplied as an option. Each type can be screwed easily onto the corresponding standard tips. It is recommended when using powders containing abrasive hard particles such as tungsten-carbides.

This wear-resistant spray nozzle will help you in terms of longer service life or consistent quality coating.

C6-3 is special nozzle with 3 holes for the powder outlet to coat large surfaces.



Part N° / Esc Code

290078 A0S WC/HT

290079 A1S WC/HT

290080 A2S WC/HT

290081 B3S WC/HT

290082 B4S WC/HT

290083 C5S WC/HT

Compact heavy duty tip

Tungsten-Carbide brazed on the tube

This is the solution for all applications where access is a problem and visibility of the fusion bath is a must. It is recommended for Glass Works and all big users of powders containing hard particles. It is available as an option.



Part N° / Esc Code

290084 A0S WC/HT

290085 A1S WC/HT

290086 A2S WC/HT

290087 B3S WC/HT

290088 B4S WC/HT

290089 C5S WC/HT

Compact heavy duty tube

Tungsten-Carbide brazed on the tube

Same as the compact heavy duty tip, however without the gas mixer. It is available as an option.

Powder Spray-Fusing

Eutalloy® SF Process - One Step Spray & Fuse for high yield



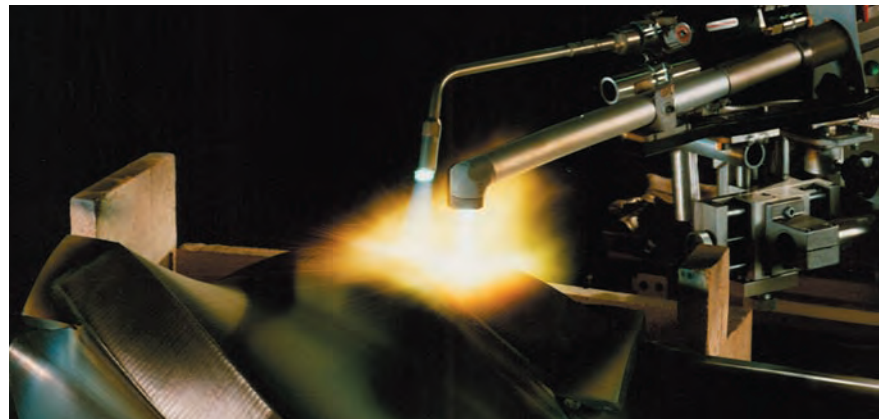
Function

The Eutalloy® SF flame spraying process is designed to deposit a range of wear resistant powder coatings with high deposit efficiency. It uses the CastoDyn DS 8000 oxy-acetylene powder spray system equipped with an SF Lance to coat onto slowly moving or stationary even surfaces of massive steel parts in a one step spray & fuse operation.

The water cooled SF Lance robust design has been engineered to perform higher powder deposition spraying rates with simultaneous fusion capabilities. This creates wear resistant requisite coatings from 0.8 mm to 3 mm thickness with strong metallurgical diffusion bonds to the steel substrate.

Advantages

- High deposition yield
- No dilution of the base material
- Best purity and performance of the coating alloy
- Homogeneous and pore free coatings
- Smooth surface for low post machining
- High bond strength
- Good shock resistance
- Thick coatings capabilities

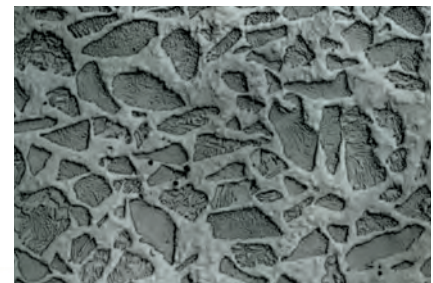


Applications

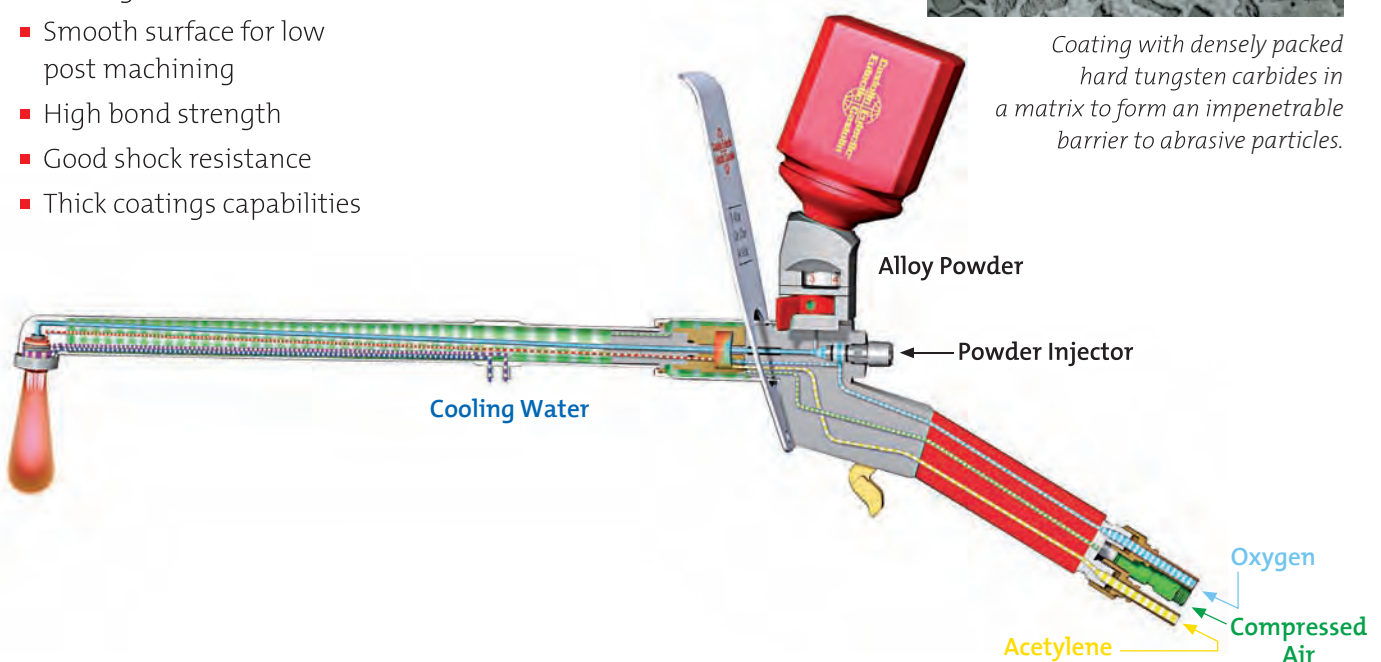
A range of self fluxing Eutalloy® SF powder alloys has been developed to meet the precise granulometry and morphology tolerances of the SF Lance system thus ensuring highest possible deposition rates combined with efficient yield, reliable deposit quality and ease of application. This comprehensive range of corrosion resistant nickel based Eutalloy® SF powder alloys is available to meet different hardness and machinability requirements when protecting industrial machine parts in service against wear by friction, abrasion, erosion, pressure etc.

Technical data

- Flame temperature: 3200 °C
- Particle velocity: not relevant
- Deposition rate: 2 to 10 kg/h
- Coating material: Self-fluxing Ni, Co or Fe base in powder form
- Coating thickness: 0.8 to 3 mm
- Coating density: 100%
- Noise level: 70 - 80 dB(A)

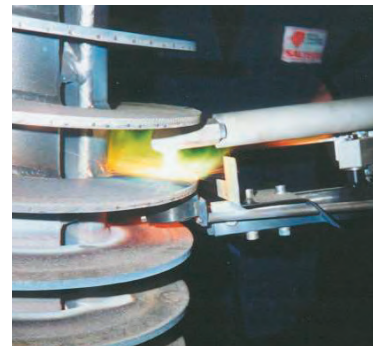
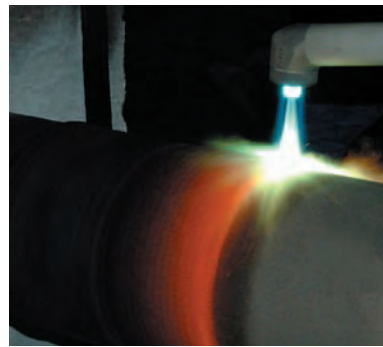


Coating with densely packed hard tungsten carbides in a matrix to form an impenetrable barrier to abrasive particles.



Powder Spray-Fusing

Eutalloy® SF Powders



Designations	Product Type	Applications	Properties
Eutalloy® SF 15211 Part N° / Esc Code 202789 15211 4.5kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	All round powder for anti-abrasion.	~60 HRC 60% tungsten carbides Excellent resistance to erosion and abrasion by fine to coarse sized abrasives.
Eutalloy® SF PE 8213 202536 PE 8213 12.5kg 202537 PE 8213 4.5kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	For thick coatings. Stabilizer in oil and gas drilling industry.	~55 HRC 55% tungsten carbides. Excellent crack resistance. Abrasion and corrosion resistance.
Eutalloy® SF PE 8215 202538 PE 8215 4.5kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	For smooth coatings and parts subject to severe abrasion such as agriculture parts, centrifugal screws.	~850 HV30 60% tungsten carbides. Excellent abrasion resistance even by fine particles.
Eutalloy® SF PE 8217 205951 PE 8217 12.5kg	Ni-Cr-B-Si-Fe alloy and tungsten carbide	For parts needing a rough surface and subject to severe abrasion such as scraper blades, drill heads, scraper parts.	~62 HRC 70% tungsten carbides Best edge build-up capability. Abrasion and corrosion resistance.

CastoDyn SF Lance

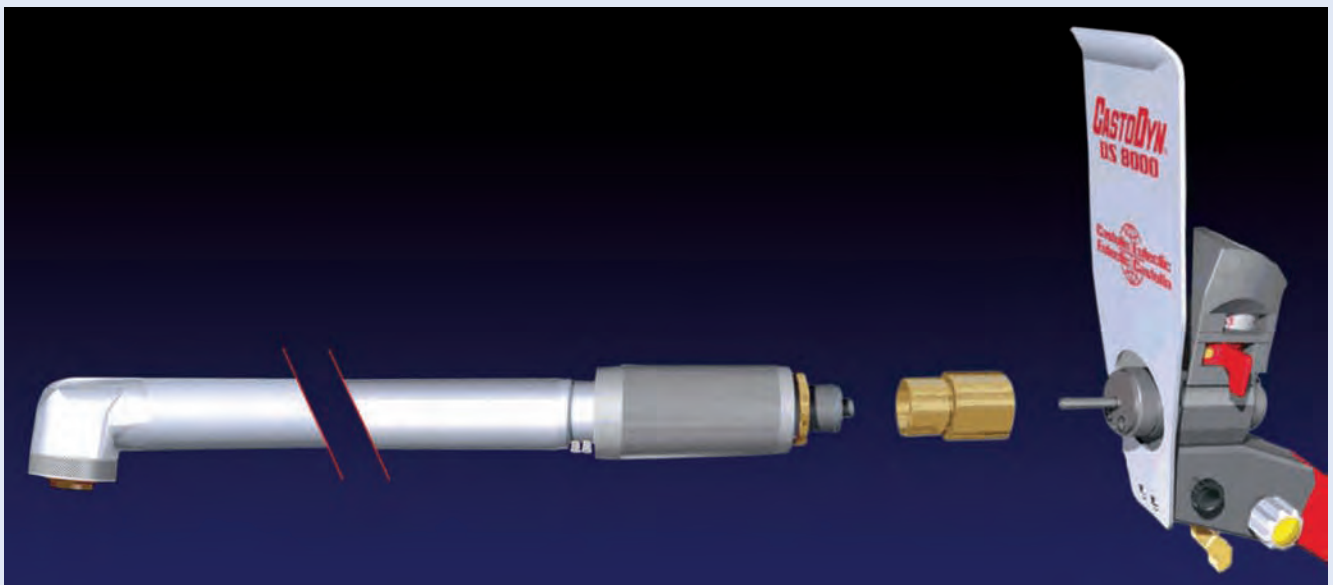
The CastoDyn SF Lance kit increases the already wide range of applications by allowing the CDS 8000 to perform spraying with simultaneous fusion.

Technical data

Standard Spray Module	SSM 50	SSM 51	SSM 52 optional
Deposition rate	4-9 kg/h	2-4 kg/h	1-2 kg/h
Typical Yield	>90 %	>90 %	>90 %
Oxygen flow rate	2000 NI/h	1000 NI/h	500 NI/h
Acetylene flow rate-Flame	1900 NL/MN	950 NL/MN	475 NL/MN
Oxygen flow rate - Carrier gas	330 NL/MN	240 NL/MN	80 NL/MN
Flame power	~ 28 KW	~ 14 KW	~ 7 KW
Deposit thickness (one pass)	1-3 mm	0,8-2,5 mm	0,8-2 mm

Advantages

- Increased energy output for highest deposition rate
- Advanced nozzle design delivers exceptional yield (>90%)
- Consumable : Eutalloy® SF powders



Schematic showing the assembly of SF Lance on CastoDyn DS 8000

Castolin Eutectic’s modular CDS 8000 torch performs more flame spraying processes, with more alloy powder types than any other comparable system. Its robust, water-cooled design permits sustained high-intensity spraying, and is ideal for both automated and manual applications.

Powder Spray-Fusing

Eutalloy® SF Equipment & Accessories

CastoDyn® SF Lance



The kit's two Standard Spray Modules (SSM 50 and SSM 51) offer different flame powers, so workplaces of any mass or thickness can be coated.

Part N° / Esc Code

203766 CastoDyn SF Lance kit 500 mm

205527 CastoDyn SF Lance kit 450 mm

203784 CastoDyn SF Lance kit 350 mm

205530 CastoDyn SF Lance kit 250 mm

CastoDyn® DS 8000



The CastoDyn DS 8000 torch is delivered in a robust carrying and storage case. This CDS 8000 kit is ready to be used with an SF lance kit and contains no Standard Spray Modul (SSM).



Part N° / Esc Code

203754 CDS 8000 kit without SSM

CastoDyn® Extra-Flat SF Lance



The CastoDyn Extra-Flat SF Lance is the solution where the access is a problem. A minimum free opening of 60 mm is enough to enable the Extra-Flat SF Lance to penetrate in the gap and to apply a coating. It is typically used to apply wear resistant coatings on decanter screws. The special Extra-Flat kit contains the SSM 51 and a SF Lance with a length of 380 mm

Part N° / Esc Code

203763 CastoDyn Extra-Flat SF Lance kit

Wear protection...

**Stronger, with
Castolin Eutectic**

Your resource for protection, repair and joining solutions

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