Low Temperature Powders for the Oil Industry

LT Eutalloy and PTA Alloys for use with Eutectic's Thermal Spray and Plasma Transferred Arc Coating and Welding Systems

- **Very High Fluidity**
- **Hardness range from 90 HRB to 50 HRC**
- **Gas Atomized**
- **Can be blended with Carbides**
- **Minimum carbide degradation due to low application temperature**
- **Customized particle size for Spray & Fuse and PTA applications**

Castolin Eutectic®
Eutectic Castolin

Powder Flame Spray-Fusing

Eutalloy® Process - One step Spray & Fuse

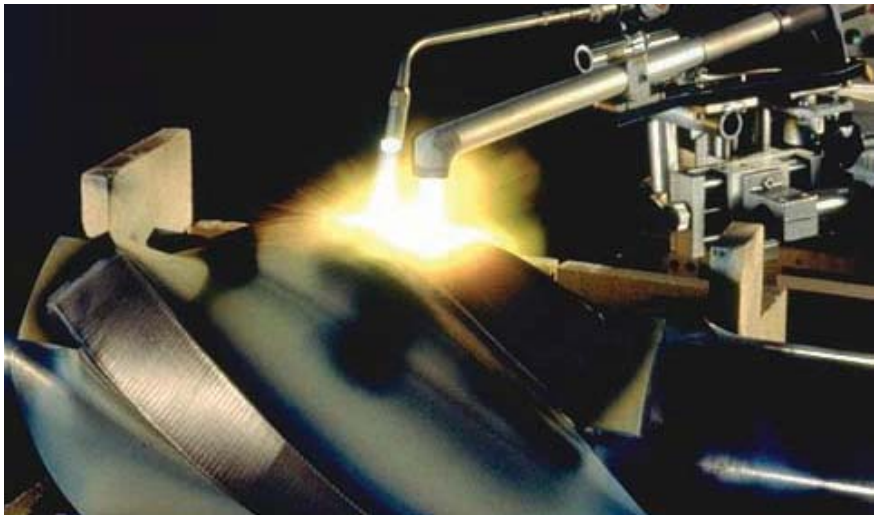
Basic Principles of the Eutalloy® Process

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.

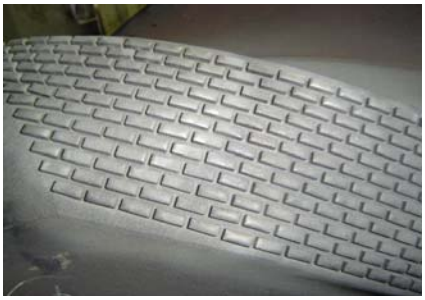
Undiluted Tungsten Carbide particles after welding (33 HRC matrix).



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



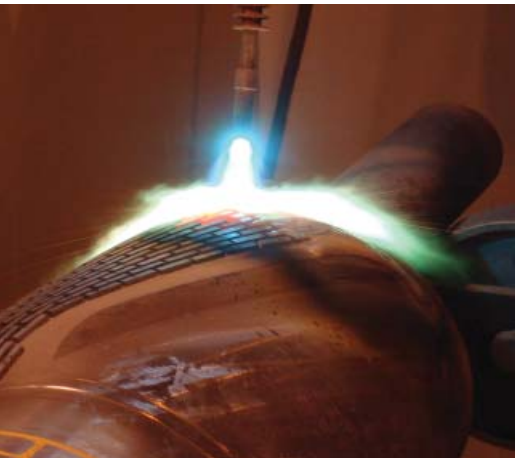
Applications

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)

Eutalloy® Process - One step Spray & Fuse



Stabilizer with Carbides being Sprayed

Carbide Fixation

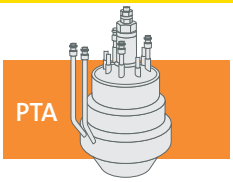
Finished Stabilzer

Eutalloy® Powders - LT 84XX Series

Designations	Product Type	Properties
Eutalloy® LT PE 8418	Self-fluxing, nickel base alloy	~ 240 HV30 (~18 HRC). Low energy input for the fusion. Spot repairs.
Eutalloy® LT PE 8422	Self-fluxing, nickel base alloy	~ 270 HV30 (~22 HRC). Low energy input for the fusion. Small to medium repairs.
Eutalloy® LT PE 8426	Self-fluxing, nickel base alloy	~26 HRC (~300 HV30). Low energy input for the fusion. Fast deposition.
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.
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.
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.

Eutalloy® LT Powders Benefits

- **250 °F lower melting point than conventional Spray & Fuse alloys**
- **Can be blended with Tungsten Carbide particles to provide enhanced wear resistance**
- **Ideal fluidity for flooding applications**



EuTroLoy® Plasma Transferred Arc Process

Plasma Transferred Arc (PTA)

Function

In the PTA process, the plasma is focused while forced through the heat resistant anode, causing a considerable increase of the arc density, energy and temperature. The filler alloy in powder form is conveyed into the plasma arc column where a shielding gas protects the weld pool from the atmosphere. The plasma arc and the heat input can be far better controlled than a conventional electric arc and the energy is almost completely spent to melt the filler metal, reducing the heat input and dilution to the minimum.

Advantages

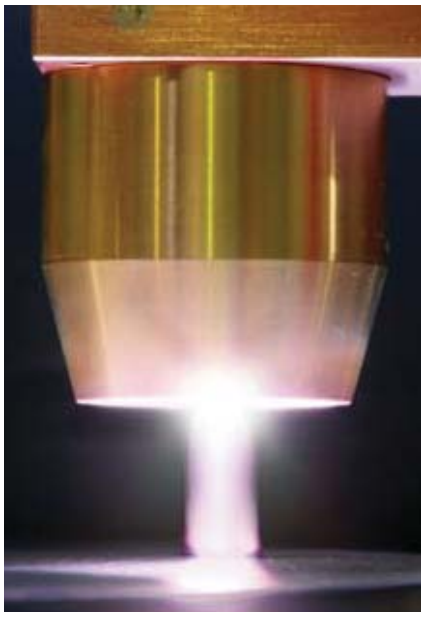
PTA technology provides a wide range of benefits compared with conventional arc welding processes:

- Lowest dilution, heat input, distortions and HAZ than any other arc welding process
- Maximum purity and perfor mance of the coating alloy
- Extra smooth surface for least post-weld machining
- Higher bond strength
- Pore free coating
- Thicker coatings capabilities

Applications

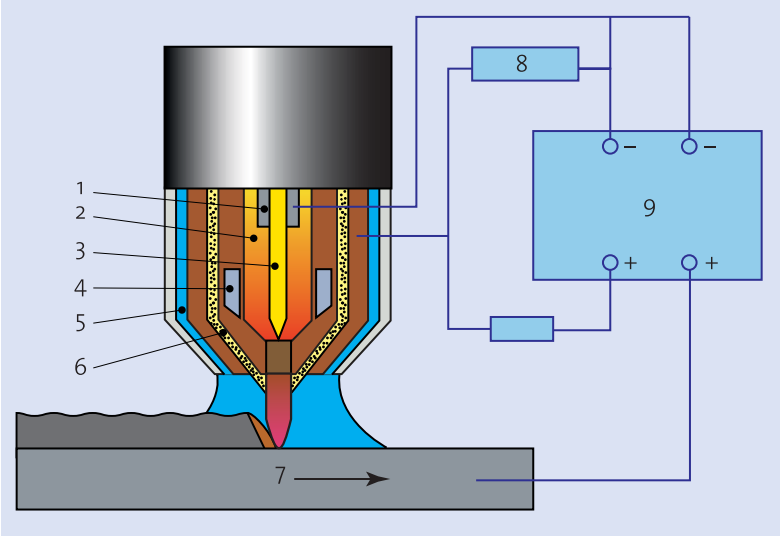
The EuTronic® GAP is the Eutectic Plasma Transferred Arc (PTA) equipment. GAP is ideal for coating and joining operations. Eutectic has developed special EuTroLoy powders for applications done with the EuTronic® GAP.

Stabilizer Protected with SF Lance



Technical data

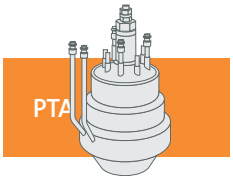
- Plasma arc temperature: up to 36,032°F (20,000 °C)
- Particle velocity: not relevant
- Deposition rate:0.55 to 5.55 g/s
- Coating thickness: 0.1 to 20 mm
- Coating density: 100%
- Noise level: 70 - 80 dB(A)



1) Cathode holding device
2) Plasma gas
3) Cathode
4) Cooling water
5) Shielding gas
6) Feeding gas and powder
7) Welding direction
8) Ignition
9) Double power supply

Powder PTA Welding

EuTroLoy® - PTA Powders



Shoe

Tungsten Carbide Tile and PTA Weld Flood

Finished Stabilizers

Eutroloy® LT PTA Powders - PG 84XX.32 Series

Designations	Product Type	Properties
Eutroloy® PG 8418.32	Self-fluxing, NiCrBSi alloy	"~ 240 HV30 (~18 HRC). Low energy input for fusion."
Eutroloy® PG 8422.32	Self-fluxing, NiCrBSi alloy	"~ 270 HV30 (~22 HRC). Low energy input for fusion."
Eutroloy® PG 8426.32	Self-fluxing, NiCrBSi alloy	"~26 HRC (~300 HV30). Low energy input for fusion."
Eutroloy® PG 8431.32	Self-fluxing, NiCrBSi alloy with addition of Cr and Mo	"~31 HRC. Low energy input for fusion."
Eutroloy® PG 8435.32	Self-fluxing, NiCrBSi alloy with addition of Cr and Mo	"~35 HRC. Low energy input for fusion."
Eutroloy® PG 8440.32	Self-fluxing, NiCrBSi alloy with addition of Cr and Mo	"~40 HRC. Low energy input for fusion."
Eutroloy® PG 8450.32	Self-fluxing, NiCrBSi alloy with addition of Cr and Mo	"~50 HRC. Low energy input for fusion."

Eutroloy® LT PTA Powders Benefits

- **20-30 Amp less required for fusion when compared with standard PTA powders**
- **Can be blended with Tungsten Carbide particles to provide enhanced wear resistance**
- **Low energy fusion prevents Tungsten Carbide diffusion within the matrix**
- **Enhanced fluidity for flooding applications**

Stronger with... Eutectic

WEAR & FUSION TECHNOLOGY

YOUR RESOURCE FOR PROTECTION, REPAIR AND JOINING SOLUTIONS

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