

Twin arc wire spraying technology

# EuTronic® Arc Spray Wires

*Enduring Performance...*



*Stronger, with  
Castolin Eutectic*



- Prolonging the service life of critical components
- Faster deposition rate
- Cost effective solution for increasing productivity
- Safe process, no flammable gases used



# EuTronic® Arc wire

## EuTronic® Arc PROCESS

### Function

EuTronic® Arc is the highest productivity thermal spraying process. EuTronic® Arc is an Arc Spray Process using a pair of wires which are melted by an electric arc. The arc has a temperature of 5 000 - 6 000°C that melts the wires continuously. Compressed gas - most often air - is used to atomise the molten wire tips and to propel the droplets towards the substrate at velocities exceeding 100 meters per second. This molten material is atomised by compressed gas and propelled towards the work-piece to form a coating. This combination of high temperature and high particle velocities gives arc sprayed coatings very good coating properties with high bond strengths and low porosity.

Arc spraying often produces large amounts of fume and high noise levels.

Arc spraying is a cold thermal spraying process where the temperature of the substrate is held below 150°C. Because of the low temperature, the work piece is not exposed to any metallurgical changes or distortion.

### Advantages

The arc spraying process is the thermal spraying process that has the highest spray rates and lowest running costs.

- Safe process
- No flammable gases used
- Cold spray process
- Not requiring the use of oxygen, kerosene or a combustible gas which means more economic coatings
- Operator can use two different wires during spraying to produce new suitable coatings.

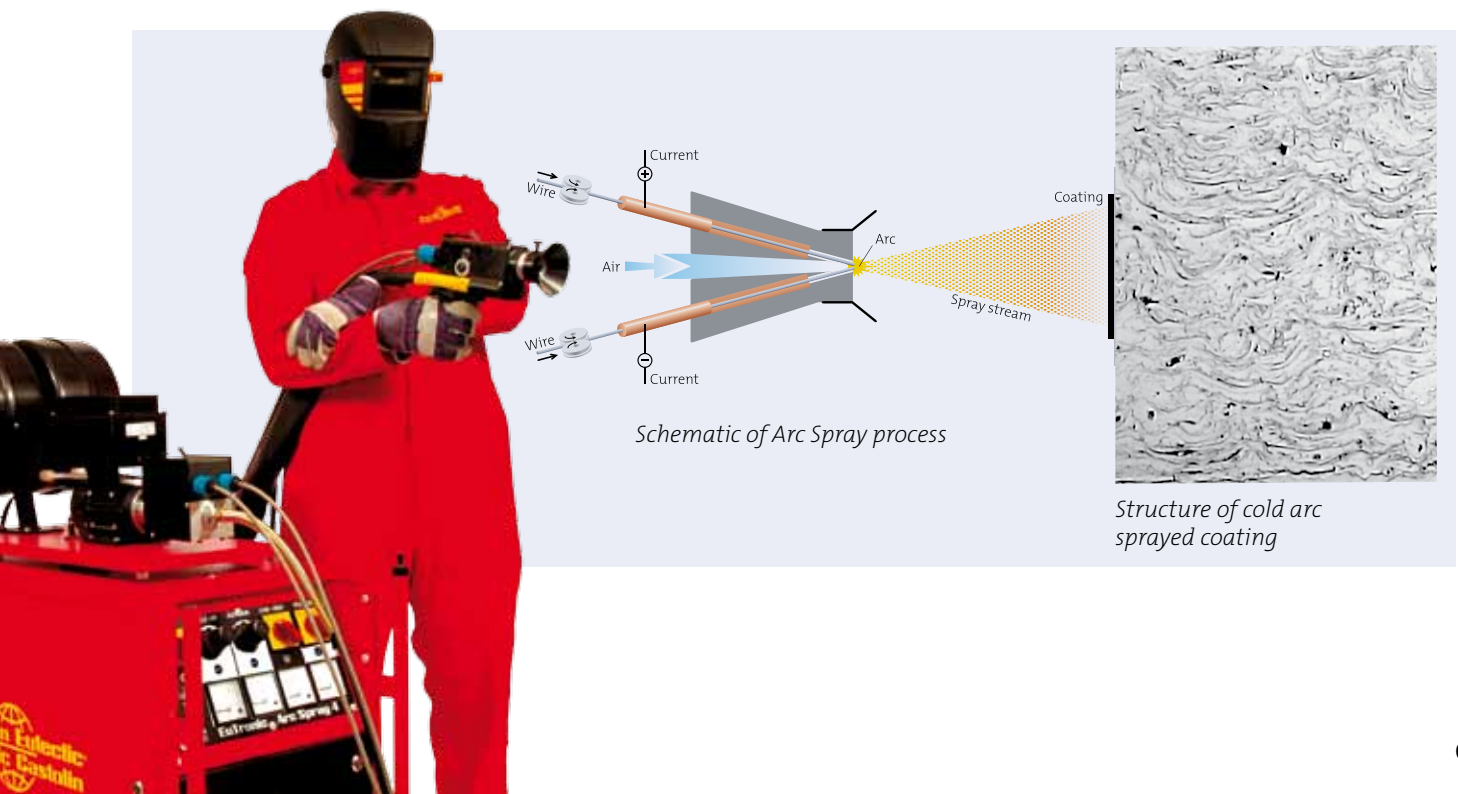
### Applications

The main applications of the arc spray process are anti-corrosion coatings of zinc and aluminium and spraying work on large components. The material to be sprayed must be electrically conductive. The most common materials are metallic material or cored wires. Low running costs, high spray rates and efficiency make it a good tool for spraying extensive areas or a large number of parts.

### Technical data

- Arc temperature: up to 6000 °C
- Particle velocity: 150 - 300 m/s
- Deposition rate: 2.5 to 36 kg/h\*
- Coating material: Metals or metal alloys in solid and cored wires form
- Coating thickness: 0.1 to 20 mm
- Coating density: 90 - 97%
- Noise level: 100 - 120 dB(A)

*\* Depending of the equipment and for zinc alloys.*



## EuTronic® Arc Spray Wire RANGE

Designations	Product Type	Applications	Properties
<b>EuTronic® Arc 500</b>	Alloy Ni-Al	Bond Coat	Hardness ~170-200 Hv Bond layer and as a one-step build-up material for dimensional restoration.
<b>EuTronic® Arc 502</b>	Alloy Fe-Cr-Ti-Si-Mn	Cement cooler plates, boiler water wall protection, pulp production digesters, steam turbine casings, cracking installations, high temperature cyclone, fume extractors etc.	Hardness ~860 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to combat erosion, thermal shock up to 650°C.
<b>EuTronic® Arc 509</b>	Alloy Fe-Cr-Al-Mo	Corrosion and erosion resistant protective coatings in boiler equipment up to 900°C.	Hardness ~260 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to combat corrosion, erosion up to 900°C and oxidation.
<b>EuTronic® Arc 520</b>	Alloy Zn	Protection of iron and steel in urban and rural environment, electro-magnetic screening. Primer for surface which will be painted.	Hardness ~12-15 HB Coatings are best used in environments where Coating pH is greater than 6.0. Resistant to atmospheric and freshwater corrosion.
<b>EuTronic® Arc 521</b>	Alloy Zn-Al	Iron and steel corrosion protection.	Hardness ~15-20 HB Resistance protection in atmospheric and marine environments.
<b>EuTronic® Arc 525</b>	Alloy Al	Protection of steel in coastal and offshore environment. Seashore building, marine loading structures. Reclaim of mis-machined surfaces.	Hardness 25-30 HB Coatings resistance to atmospheric and salt water immersion. Good heat and electrical conductivity. Not suitable for alkaline environment.
<b>EuTronic® Arc 532</b>	Alloy Fe-Cr-Mn-C	Alternative to 13%Cr-steel. Hard chrome replacement on hydraulic pistons. Wear resistant layers for rollers in paper machines, bearing and sealing seats.	Hardness ~640 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to combat metal-to-metal friction, corrosion and oxidation.
<b>EuTronic® Arc 545</b>	Alloy Ni-Cr-Ti	Boiler equipment. Tubes of black liquor recover boilers and coal fired utilities	Hardness: ~330 HV0.3 Corrosion resistance to vanadium and sulfur gases. Wear resistant. Good bond strength.
<b>EuTronic® Arc 560</b>	Alloy Fe-C-Si-Mn-Cr	Dimension Restoration.	Hardness ~320 Hv Excellent resistance to mild abrasion and corrosion for dimensional restoration.
<b>EuTronic® Arc 563</b>	Alloy Fe-Ni-Al-Mo	Diesel firedecks Cylinder heads, rebuild worn bearing areas.	Hardness ~90 HRb Self-bonding, machinable coating suitable to rebuild worn diesel engine components.
<b>EuTronic® Arc 579</b>	Alloy Fe-Ni-Cr-Si-Mn	Worn general engineering components, undersize external or internal diameters, bearing seats and faces, housings, shrink or force fit areas, flat surfaces etc. Hot gas corrosion protective coatings in heat exchangers, process piping, etc.	Hardness ~230 HV0.3 Self bonding alloy for thick or thin coatings with good corrosion resistance. Easy machinability, like machining solid mild steel.
<b>EuTronic® Arc 595</b>	Alloy Fe-Cr-B-Si-Mn-C	Exhaust fans, pump components, coal-fired boilers, super-heaters, economiser waterwalls, boiler tubes, boiler installations, lamella seals and «Füller» cooler plates in cement works etc.	Hardness ~965 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to slurry erosion, corrosion and low stress abrasion. Withstands service environment up to 925°C.

# EuTronic® Arc wire

## Arc spray wire production

Today the vast majority of wires used for arc wire spraying are solid, extruded wires of standard compositions of zinc and aluminium. By shifting to the more advanced «cored wire», innovation in surface protection is easier to achieve. Cored wires consist of a formal metal strip filled with different powders (metal and mineral). The flexibility in choice of metal and powder compositions, have enabled us to produce wire compositions with new high-tech production equipment that are impossible to produce as solid wires. Such wires have been tuned for arc wire spraying and to produce unique combinations of wear and corrosion properties for applications in boiler protection for example. The surface quality of the wire is also optimized for continuous arc wire feeding using special roller surface and oven heat treatments.



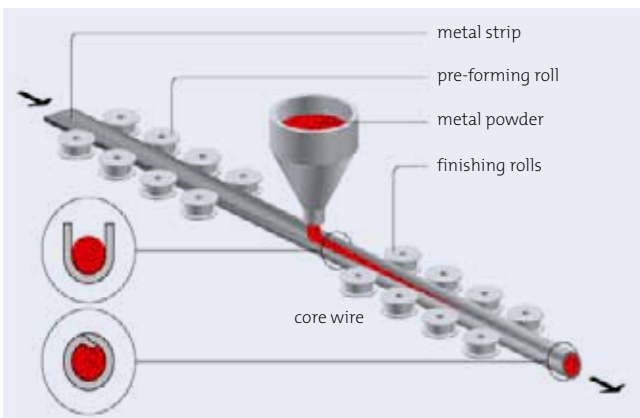
State-of-the-art production facility



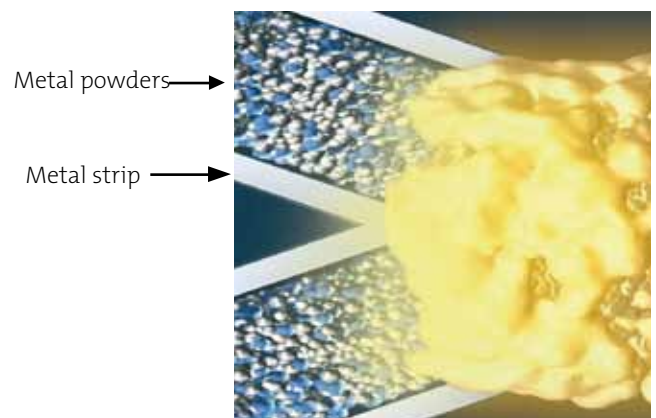
Robust and safe carriage packaging



Quality wire awaiting baking to improve surface properties



Arc wire production process



Unique wire characteristics

## Arc Wire spray equipment development

Castolin Eutectic have been manufacturing specialist cored wires for nearly 20 years to be used on all standard arc wire equipment available on the market. Usually, the superior quality of the wires outperforms competition wires on these standard arc wire spray equipment. In order to extract the best potential of the wires in terms of coating quality and spraying systems, Castolin Eutectic decided to design and bring to the market dedicated Arc Wire Spray equipment in 2007 which would reliably reproduce the excellent quality of the coatings afforded by the wires. Once again the specialist wires works perfectly with all existing equipment in the market but to offer a complete package and the guaranty an excellent coating we recommend the EuTronic® Arc Spray 4 system.



*Spraying component*

## EuTronic® Arc Spray 4 system

The EuTronic® Arc Spray 4 is robust, reliable and easy to use. The Arc Gun and the drive system are coupled to a 350 amp, switched voltage power source. This power source features sealed electronics for excellent reliability in the harshest spray environments. The wire feeder unit is neatly mounted on the power source, leaving it free to swivel and follow the operator whilst spraying. There is no motor in the gun. Instead, the Gun 4 uses a patented 'Synchrodrive' system, where a single, sealed motor with a flexible drive arrangement, powers a reliable, positive drive push/pull up to a distance of 20 m.



# Castolin Eutectic

## CastoLab® Services Workshops

Our mission is to develop applications and solve customer problems. The CastoLab® Services can develop advanced procedures to allow transfer of complete solutions to end users. We offer a complete and comprehensive service for the maintenance of machine parts and major components subject to extensive service wear or needing repair. Work can either be undertaken in our workshops or alternatively on site. Often the parts being repaired or protected need to be produced on

a regular basis, and here “specialist prepared parts” can be produced in unique manufacturing environment, from 10's of parts to 100,000 of parts per year. Based upon hundreds



CastoLab® Services for major repairs

of successful applications approved by our clients across the globe, the CastoLab® Services can provide optimized solutions to combat specific wear in your boiler.



Local support at customer's plant

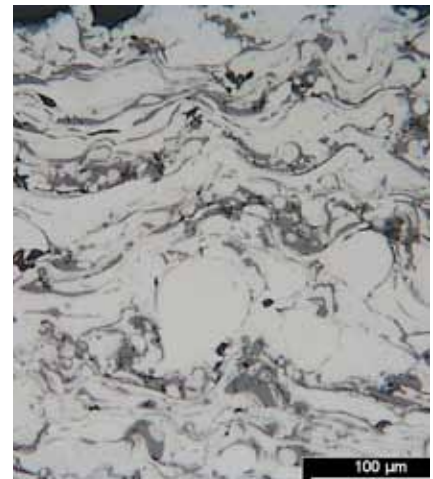
## Alloys development, applications



Quality laboratory



Micrograph of 595 EuTronic® Arc wire



Micrograph of 579 EuTronic® Arc wire



### TeroLink

The unique TeroLink® database of Castolin Eutectic contains more than 7,600 fully documented approved Case Studies from around the globe. Thanks to this unique database you will enjoy the know-how of thousand of specialists coming from all parts of the world. The Case Studies include pictures, application description and cost saving analyses.



## History of Castolin Eutectic



**1906** Foundation of Castolin Eutectic in Lausanne, Switzerland by Jean-Pierre Wasserman. His stroke of genius : to discover a low temperature way to weld cast iron.

**1940** Foundation of Eutectic Welding Alloys Corporation in New York.

**1960** International consolidation under Castolin Eutectic.

**1963** Launch of powder spray-fuse Eutalloy® torch for powder spraying with simultaneous fusion. More than 42000 units were sold.

**1965** Powder production by water atomisation.

**1976** Powder production by gas atomisation.

**1985** Marketed the world's first amorphous powder for thermal spraying.

**1994** Patented powder wear plate production.

**1995** Leading HVOF, Plasma and wire spraying with TAFE.

**2000** Merger with Messer Cutting & Welding and creation of the MEC Group - Messer Eutectic Castolin.

**2005** Part of the Messer World gas supply company.

**2006** World's first anti-satellite gas atomiser for powder production.



*Product Portfolio - Widest in the Industry*

### Training



*Training*

To increase customer know-how in wear technology and repair techniques, we have developed a full line of seminars and training programs, teaching all relevant personnel from welders and engineers to sales teams and managing directors.

Together with our sister companies in the Messer World, we can offer our customers a very powerful range of products and services. Being Part of the Messer World means:

- Investment of over € 420 million
- More than 6,000 motivated employees
- Over 100 factories to meet customer needs
- Technical sales support in over 120 countries
- 2,000 technical sales people in the field with our customers every day

## Your resource for protection, repair and joining solutions

**Statement of Liability:** Due to variations inherent in specific applications, the technical information contained herein, including any information as to suggest product applications or results, is presented without representation or warranty, expressed or implied. Without limitation, there are no warranties of merchantability or of fitness for a particular purpose. Each process and application must be fully evaluated by the user in all respects, including suitability, compliance with applicable law and non-infringement of the rights of others, and Castolin Eutectic and its affiliates shall have no liability in respect thereof.

*Stronger with...*

*Castolin Eutectic*

*WEAR & FUSION TECHNOLOGY*



*Ask for a demonstration  
from our Application  
Specialists.*

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