Twin arc wire spraying technology

EuTronic® Arc Spray Wires

Enduring Performance...

- Prolonging the service life of critical components
- Faster deposition rate
- Cost effective solution for increasing productivity
- Safe process, no flammable gases used
**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 workpiece 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 workpiece is not exposed to any metallurgical changes or distortion.

**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**
- Temperature: 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.

**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.

**Schematic of Arc Spray process**

**Structure of cold arc sprayed coating**
## EuTronic® Arc Spray Wire RANGE

<table>
<thead>
<tr>
<th>Designations</th>
<th>Product Type</th>
<th>Applications</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>EuTronic® Arc 500</td>
<td>Alloy Ni-Al</td>
<td>Bond Coat</td>
<td>Hardness ~170-200 Hv Bond layer and as a one-step build-up material for dimensional restoration.</td>
</tr>
<tr>
<td>EuTronic® Arc 502</td>
<td>Alloy Fe-Cr-Ti-Si-Mn</td>
<td>Cement cooler plates, boiler water wall protection, pulp production digesters, steam turbine casings, cracking installations, high temperature cyclone, fume extractors etc.</td>
<td>Hardness ~860 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to combat erosion, thermal shock up to 650°C.</td>
</tr>
<tr>
<td>EuTronic® Arc 509</td>
<td>Alloy Fe-Cr-Al-Mo</td>
<td>Corrosion and erosion resistant protective coatings in boiler equipment up to 900°C.</td>
<td>Hardness ~260 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to combat corrosion, erosion up to 900°C and oxidation.</td>
</tr>
<tr>
<td>EuTronic® Arc 520</td>
<td>Alloy Zn</td>
<td>Protection of iron and steel in urban and rural environment, electro-magnetic screening. Primer for surface which will be painted.</td>
<td>Hardness ~12-15 HB Coatings are best used in environments where Coating pH is greater than 6.0. Resistant to atmospheric and fresh water corrosion.</td>
</tr>
<tr>
<td>EuTronic® Arc 532</td>
<td>Alloy Fe-Cr-Mn-C</td>
<td>Alternative to 13%Cr-steel. Hard chrome replacement on hydraulic pistons. Wear resistant layers for rollers in paper machines, bearing and sealing seats.</td>
<td>Hardness ~640 HV0.3 Self bonding alloy with enhanced surface wear resistance properties to combat metal-to-metal friction, corrosion and oxidation.</td>
</tr>
<tr>
<td>EuTronic® Arc 545</td>
<td>Alloy Ni-Cr-Ti</td>
<td>Boiler equipment. Tubes of black liquor recover boilers and coal fired utilities</td>
<td>Hardness: ~330 HV0.3 Corrosion resistance to vanadium and sulfur gases. Wear resistant. Good bond strength.</td>
</tr>
<tr>
<td>EuTronic® Arc 560</td>
<td>Alloy Fe-C-Si-Mn-Cr</td>
<td>Dimension Restoration.</td>
<td>Hardness ~320 Hv Excellent resistance to mild abrasion and corrosion for dimensional restoration.</td>
</tr>
<tr>
<td>EuTronic® Arc 563</td>
<td>Alloy Fe-Ni-Al-Mo</td>
<td>Diesel firedecks Cylinder heads, rebuild worn bearing areas.</td>
<td>Hardness ~90 HRb Self-bonding, machinable coating suitable to rebuild worn diesel engine components.</td>
</tr>
<tr>
<td>EuTronic® Arc 579</td>
<td>Alloy Fe-Ni-Cr-Si-Mn</td>
<td>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.</td>
<td>Hardness ~230 HV0.3 Self bonding alloy for thick or thin coatings with good corrosion resistance. Easy machinability, like machining solid mild steel.</td>
</tr>
<tr>
<td>EuTronic® Arc 595</td>
<td>Alloy Fe-Cr-B-Si-Mn-C</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
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 turned 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

Metal powders

Metal strip
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.

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

**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 TFAA

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.

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.

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.

Your resource for protection, repair and joining solutions

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
Stronger with...
Castolin Eutectic

WEAR & FUSION TECHNOLOGY

Ask for a demonstration from our Application Specialists.

-> www.castolin.com <<<
-> www.eutectic.com <<<