Boiler Repair and Refurbishment Anti-wear and corrosion solutions

Enduring Performance...

Stronger, with Castolin Eutectic

- Cost reductions
- Increase productivity
- Reliable partner for materials and services
- Broad range of wear/corrosion solutions
- Experts of boiler maintenance & repairs

Castolin Eutectic
Boiler repair

Boiler repairs Specialists

Boilers are large and expensive installations which can suffer enormously from wear caused by corrosion and erosion, aggravated by very high temperatures. The exact type of wear experienced varies from one part of a boiler to another and is influenced by the overall design of the boiler and the type of combustible fuel. Castolin Eutectic protective coatings significantly extend the service life of worn boiler components; making them last longer than uncoated new parts. Castolin Eutectic protective coatings are a more cost-effective solution than replacement of the worn parts with new ones and offer direct savings in materials and valuable reductions in downtime. Additionally, Castolin Eutectic offers the widest range of coating products, so protection can be tailored against the specific combination of wear phenomena found in each part of every boiler.

We are flexible! Jobs on-site or in our facilities

We have general purpose facilities in most countries, equipped with “state-of-the-art” technology, diverse process technologies and highly skilled technical specialists. Depending on your request, the job can be undertaken in our own facilities as well as at your plant. When your boiler components are too large to be moved for example, our CastoLab® Services maintenance experts will visit your premises to solve the problem on-site.
Excellent references

Together with our partners, during the last decades we have proved that preventive maintenance on boilers can extend the lifetime by as much as 2 to 3 times. Such maintenance operations are undertaken every day by our technician specialists, with 80% of them being on-site repairs the rest being repairs in our workshops. Our specialists are highly adaptable experts having worked on a broad range of boiler designs for more than 20 years throughout the world. From Pulverized Fuel fired boilers to fluidized bed boilers, we have also been successful in supplying boiler manufacturers with new OEM parts produced on a regular basis with the unique Castolin Eutectic protective coatings.

The table below offers an illustration of the applications, solutions and successes of our products, around the world. Some of our boiler partners and power plant end users are also listed.

<table>
<thead>
<tr>
<th>Protected surface</th>
<th>Castolin Eutectic solutions</th>
<th>Previous lifetime</th>
<th>Lifetime prolonging factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economizer tubes</td>
<td>Powder Cold spraying</td>
<td>1 year</td>
<td>x2</td>
</tr>
<tr>
<td>Economizer tubes</td>
<td>EuTronic® Arc Spray</td>
<td>3 years</td>
<td>x2</td>
</tr>
<tr>
<td>Blades of the circulation pump for the turbine cooling water</td>
<td>Open Arc welding</td>
<td>6 months</td>
<td>x4</td>
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<tr>
<td>Bottom of chain conveyor</td>
<td>CDP® wear plate</td>
<td>1 year</td>
<td>x10</td>
</tr>
<tr>
<td>Heater</td>
<td>EuTronic® Arc Spray</td>
<td></td>
<td>x3</td>
</tr>
<tr>
<td>Water wall panel</td>
<td>EuTronic® Arc Spray</td>
<td>6 months</td>
<td>x2</td>
</tr>
<tr>
<td>Fluidized bed nozzles</td>
<td>MIG welding</td>
<td>3-6 months</td>
<td>x4</td>
</tr>
<tr>
<td>Pipe of super heater</td>
<td>Powder Cold Spraying</td>
<td>2 years</td>
<td>x3</td>
</tr>
<tr>
<td>Screw for ash</td>
<td>Powder Cold spraying + TeroCote® brazing</td>
<td>1 week</td>
<td>x10</td>
</tr>
<tr>
<td>Super heater tubes</td>
<td>Powder Cold Spraying</td>
<td>2 years</td>
<td>x2</td>
</tr>
<tr>
<td>Super heater tubes</td>
<td>EuTronic® Arc Spray</td>
<td>3 years</td>
<td>x2</td>
</tr>
<tr>
<td>Exhaust fan</td>
<td>EuTronic® Arc Spray</td>
<td>1 year</td>
<td>x2</td>
</tr>
<tr>
<td>Exhaust fan</td>
<td>HVOF</td>
<td>2 years</td>
<td>x3</td>
</tr>
<tr>
<td>Vertical roller mill + table</td>
<td>Open Arc welding</td>
<td>1 year</td>
<td>x2</td>
</tr>
<tr>
<td>Economizer tubes panel and 4 collectors</td>
<td>EuTronic® Arc Spray</td>
<td>1 year</td>
<td>x6</td>
</tr>
<tr>
<td>Water wall panel</td>
<td>EuTronic® Arc Spray</td>
<td>2 year</td>
<td>x6</td>
</tr>
<tr>
<td>Water wall tubes</td>
<td>EuTronic® Arc Spray</td>
<td>1 year</td>
<td>x6</td>
</tr>
<tr>
<td>Rotary valve, waste screws</td>
<td>CDP® powder wear plate</td>
<td></td>
<td>x4</td>
</tr>
<tr>
<td></td>
<td>CDP® wear plate</td>
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</table>
Boiler repair

CastoLab® Services Workshops

Our mission is to develop applications and solve customer problems. CastoLab® Services can develop advanced procedures to transfer complete solutions to our customers. 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 our specialist workshops, from 10’s to 100,000 of parts per year. Based upon hundreds of successful applications approved by our customers across the globe, the CastoLab® Services can provide optimized solutions to combat specific wear and corrosion in your specific boiler.

Large CastoLab® Services for major repairs

Wear and corrosion analysis

The latest state-of-the-art testing machines and facilities are essential to accurately measure and understand the complex relationship between chemistry, process and application. We work with world experts in Technical Universities for testing and modelling in addition to having fully equipped labs with electron microscopes and wear test facilities.

Local support at power station

Induction fusing of patented corrosion-resistant coatings

Experts measuring thickness on boiler tubes

Unique impact, abrasion wear test machine

Corrosion on boiler tubes

Schematic of test specimen sectionning procedure from spray and fused tube

Time-temperature curve for typical substrate metals
Waste Incinerator Boilers - our solutions

Fluidized Bed Boilers - our solutions
Boiler repair

Coal Fire Boilers - our solutions

- Soot blow system
- Stop valve repair
- Boiler Tube panel
- Raw coal feeding screw
- Control valve repair
- Vertical Roller Mill repair
- Separator
- Raw coal feeding screw
- Slide valve

www.castolin.com  www.eutectic.com
Flexible processes

Our experts can provide outstanding coatings quality using wide a range of processes, from cold spraying, spray and fuse, wire spraying to HVOF.

Thanks to our long experience with boilers refurbishment we have developed special equipment installations that addresses the issues of boiler access for on-site coating or full automation for OEM boiler coating work.

New Materials development

Providing complete solutions for boiler maintenance and performance improvement is our goal. Thanks to our R&D department and the long experience in maintaining boilers, we have developed special products providing unbeatable wear and corrosion resistance: our NanoAlloys® as well as our range of unique powders and wires developed for boiler coating.

NanoAlloys®: Castolin Eutectic has a powerful weapon in the wire alloys for its war on “High Load High Wear” by using a new approach. The world’s first NanoAlloy™ formulation was developed to provide outstanding abrasion and erosion resistance.

This was achieved by using a lower cost ferrous alloy with bulk hardness values reaching 71HRC!

Industry proven Spray and Fuse alloys: Castolin Eutectic was amongst one of the first companies to recognise and offer nickel-based self fluxing alloys as a wear and corrosion resistant coating for boiler tubes in the 1980s and have developed a considerable reputation and experience of these alloys. A novel high Molybdenum, high silicon alloy was developed and patented for severe corrosive environments and patented. This solution combined the inherent properties of such fused coatings such as diffusion bonding, zero through porosity with improved performance over even welded 626 alloys. The increasing demands of waste incineration environments are leading to new developments.

EuTronic® Arc Wires: Through development in the early 1990s with leading power companies and high temperature wear industry proven Spray and Fuse alloys substitutes a family of iron-based high temperature boiler coating alloys was developed for arc wire spraying. Today these solid industrial references are being used for new alloy development, spurned by improvements in application equipment and increasing performance demands.

HVOF: The unique quality and properties of HVOF are attractive to boiler coating. The experience gained in arc wire and powder alloy developments is being modified to bring a new generation of Fe and Ni alloy powders for HVOF spraying.
Boiler repair

Consumables Manufacturing

Castolin Eutectic believes in controlling all aspects for the consumable production process to maintain coating quality, and all powders and arc wires used for boiler coating are developed and manufactured in-house. With over 10 manufacturing plants around the world we are also able to develop and produce our own products locally. We are producing our consumables with the latest high-technology production equipment and test each batch. By having a wide range of products made in-house, Castolin Eutectic is able to offer excellent service, technical support and also to adapt the products to the needs of its customers. As our 10 production plants are located throughout the world, we are able to truly respond to local needs.
Reparing Worldwide
With 2000 people worldwide in over 100 countries and more than 700 international Application
Specialists in the field, we can provide unbeatable services all over the world. Our Applications experts can literally be at your plant within hours, allowing us to give you unsurpassed service and support.

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 thousands of specialists coming from all parts of the world. The Case Studies include pictures, application description and cost-saving analyses. These complete welding procedures can be exchanged and are updated on a regular basis.

Your Industry Partner and Expert
A century at the forefront of protective materials technology has positioned Castolin Eutectic as the world’s premier industrial partner. Our comprehensive know-how is unrivalled, and our industry partnerships continue to thrive. We provide solutions to all of the major companies operating in industry with global industrial programs for steel, cement, mining, power, oil, waste & recycling, etc.

Within the International PowerTec program, our boilers specialists are supported by the group’s full range of manufacturing, R&D, training and other resources that have made Castolin Eutectic a long-established leader worldwide in fighting wear and providing specialist joining solutions. The boiler program also benefits from the experience of hundreds of specialists thanks to the key industry programs which improves communication which concerns best practice between experts.

Castolin Eutectic in depth expertise is reflected in the large volume of international publications on boiler coatings and the wear of coatings under high temperature erosion conditions, which can be obtained from the website.
Boiler repair

Your Industry Partner

Waste and recycling industry
From waste incineration, automobile and tyre shredding, glass recycling, to construction debris elimination, we have innovative solutions for: shredders, feeding hoppers, crushers, screws, hammers, conveyor bed, transport belts, knives...

Pulp and paper
From the woodyard through the bleaching and to the mill service, we have innovative solutions for: chain link, rink debarker arm, hammers&striker plate, sand trap, press screw, chipper unit, Gear guide plate, lifting tube...

Power generation
We have a detailed understanding of the major wear problems within the power generation industry and can provide you with industry-tested application on: screws, breaker arms, conveyor bed, coal mill, water panel, ignition umbrella for the oil burner, fans...

Ignition Umbrella for Oil Burner

Fan built with CDP 212 powder plate

Screws

Coal Mill

CDP Protected Conveyor Bed
Together with our sister companies, the Messer Group, can offer 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

Castolin Eutectic recived the Frost & Sullivan award in recognition of demonstrated excellence in customer service leadership within the European Repair & Maintenance Welding industry. This award reflects the close collaboration with our customers, and their satisfaction, this for more than a century.

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

1940 Foundation of Eutectic Welding Alloys Corporation in New York.

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

1960’s International consolidation under Castolin Eutectic.

1970’s Creation of training centers for Maintenance & Repair technologies.

1976 Powder production by gas atomisation.

1985 International consolidation under Castolin Eutectic.

1997 Development of new boiler coatings

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

2001 Creation of global POWERTEC initiative and global industry program

2005 Part of the Messer World.

2006 100 years.

2007 World’s first NanoAlloy welding product

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 there of.
Stronger with... Castolin Eutectic

WEAR & FUSION TECHNOLOGY

Ask for a demonstration from our Application Specialists.

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-> www.eutectic.com <<<