

# Key Industry Program



Stronger, with Castolin Eutectic





Castolin Eutectic is an international company focused on its customers to analyze, study and propose the best welding, coating or brazing technology solutions in order to reduce maintenance costs and increase service life and effectiveness of production equipment.

Wear phenomena costs the production industry millions of Euro every year. Wear gradually reduces process efficiency and can lead to costly unplanned stoppages and the need to purchase and stock new replacement parts. Fortunately, worn or broken parts can be restored and protected against future wear.

Castolin Eutectic has the solutions for wear and Fusion problems. For more than a century at the forefront of wear and fusion materials technology, we are at your service with the largest and most experienced field support to meet your specific challenges. With a vast product range of alloys, processes, functional finished parts and fully automated systems in the areas of Welding, Brazing and Coating technologies, your business can become STRONGER with Castolin Eutectic. In addition to the traditional personal service of our field technicians, we are increasingly performing the actual work for you with our Castolin Services business through either our workshops or at your site.

Cost Reduction Program - Maintenance Welding Technology Partnership Program and Smart Maintenance & Repair

#### ANALYSIS

The first step to a good solution is a correct analysis. To facilitate this, we have created a document that can be easily completed in collaboration with our technical delegate, which reflects the most important parameters to be considered to develop in-house solutions to wear problems. The completion of this document will allow our Technical Department to prepare a proposal for a professional solution tailored to the client's real needs.



4

6

#### **TECHNICAL REPORT**

With the information provided, our Technical Department prepares a report. In this document, the base material is analyzed, the wear causing factors are carefully considered for optimal prevention and the most suitable materials / procedures are defined. Finally a basic operating procedure is indicated. The information is delivered to the technician responsible for study and evaluation.

#### APPLICATION REGISTRATION

Always subject to the customer's approval, we first propose to register the job done in our confidential "FAR" data base where the short application summary remains on hold until confirmation of service results.

Then we propose to introduce it in its final destination, a data base for proven applications called TeroLink. This allows both the customer and Castolin to take advantage of the field tested application details and to quantify the generated cost savings.

#### **ECO TEST - COST REDUCTION**

At the end of the service life of the part involved, we are ready to establish a detailed cost analysis to evaluate the practical direct savings achieved through mutual collaboration.

This will show the real value of our teamwork and the important economies made by the maintenance department. This is the ultimate goal of our proposal "Cost reduction" proposal.

#### JOB DEVELOPMENT

Once the client considers the repair to be feasible, Castolin Eutectic puts at your service all the Technical Department for the development of the procedure outlined above:

- Local specialized Technical staff.
- Our Castolin Services workshop.
- and / or a collaboration with your
  - selected subcontractor.

#### TEROLINK

Finally we propose to submit the complete application as verified in our Terolink Database. This database allows both the customer and Castolin Eutectic to take advantage of the existing proven solution, update it, include further information and use it for future confidential promotion of the solution.

3

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RAW MATERIAL PROCESSING >	STEEL MAKING>	8         8         8           8         8         8           8         8         8
RAW MATERIALS PROCESSING	IRON & STEEL MAKING	ROLLING MILL
Image: series of the series	Blast Furnace   EAF   Opposite     BOF	<image/> <image/> <image/>
ScrapPelletsImage: ScrapImage: ScrapCoke PlantScrap Shredding	Ingots Continuous Casting	Cold rolling

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# RAW MATERIAL PROCESSING



Iron ore bucketwheel excavator (NL\_M1\_0110) • Abrasion + Impact • Complex carbide CDP ® plates







Iron ore bucketwheel excavator (BR\_M10273) • Abrasion + Impact • CDP ®

• 4666 CDP ®



VRM –multiple parts
For crushing coal before loading in the coke plant
On site job – Castolin Services

### **Our applications**

Iron ore, coal, limestone, fluxes and scrap are unloaded in the raw material area. They are classified, stored, crushed, grinded and handled for transport into the next production process. All these activities produce a combination of Wear phenomena in the different machines and parts involved. Their service lifetime can be extended with different solutions, thanks to the **cost reduction program from Castolin Eutectic.** 



Homogenization shovel (BR\_M1\_0273)

- Abrasion + Impact
- Complex Carbides CDP ®

• 4666 CDP ®



Scrap handling crane (AT\_M1\_0395)
Impact + Metal-metal friction
EnDOtec wires
DO\*02 +DO\*05



Coal roller press (FAR 2178) • Impact + Abrasion • TeroMatec Wires • 4923 TM + 4601 TM



Crasher hammer (CH\_M1\_0150) • Impact + Abrasion

- TeroMatec Wires
- 3205TM + 4625 TM
- Stronger, with Castolin Eutectic

# RAW MATERIAL PROCESSING



Cast iron conduct of coke plant (FAR 3556) • Repair of crack + Thermal fatigue

- Cast iron Eutectrodes
- 7330 D





Sinter teeth (FAR 27365)

- Impact + Abrasion + Temperature
- EnDotec wires, Eutectrodes
- 6070 N



- Sinter rotor
- Abrasion + Temperature
- Turn key solution
- Epsilon 3



Exhaustor sinter area (FAR 11177)

- Erosion
- EnDOtec wires
   DO\*11

### **Our applications**

The raw materials are transported into the coke plant, sinter or pellet in order to adapt the granulometry, homogenity, density and composition for the Iron & Steel making.

Based upon hundreds of succesful and proven applications by our clients across the globe, **Castolin Eutectic can provide a wide range** of products and technologies to combat different Wear phenomena in the Iron & Steel Industry.



Coke sprocket (FAR 2890)

- Mechanical fatigue
  EnDOtec wire
- DO\*612 S



Sinter rotor belt (FAR 30646)

- Abrasion
- TeroMatec wire
- 4666 TM



Sinter hot sieves • Abrasion + Temperature

- Laser cladding
- LC11

# **IRON & STEEL MAKING**



Impeller of EAF (FAR 2781)

• Erosion + Corrosion

• CDP ® 112 + DO\*11

• CDP <sup>®</sup>, EnDOtec wires

STEEL MAKING>





Hot wind valve blast furnace (FAR 2891)

- Erosion at high temperature
- Cast iron Eutectrodes
- Nickel base Eutectrode



#### Additive chute of EAF (FAR 2782)

- Abrasion + Impact
- Turn key solution
- 4666 CDP ®

#### **Our applications**

After processing the respective raw materials, they pass through the blast furnace, electric arc furnace (EAF) or basic oxygen furnace (BOF) to get pig iron or Steel. The first step for a good solution is a correct analysis. To facilitate this, we have created an analysis document that can easily be completed in collaboration with our technical delegate. The document reflects the most important parameters to be considered to develop in-house solutions to your wear problems.



Pig iron/ EAF conducts (FAR 3665/4094)
Abrasion
Castotubes



Exhaust pipe EAF (ES\_M1\_0432) • Erosion + Temperature • Arc Spray





Electrode clamp (FAR 4533) • Abrasion + Temperature

- CastoTig, CastoMag
- 45709 W

# **IRON & STEEL MAKING – CONTINUOUS CASTING**



Billet descaling blades (FAR 11091)

Impact + Abrasion

• Eutectrode, CastoTIG

• 6080XHD + 45303 W





Straightener rollers (FAR 2849)

- Abrasion + Friction + Temperature
- EnDOtec wires
- DO\*05



False ingot (FAR 3330) • Friction + Abrasion

- EnDOtec wires
- DO\*267

### **Our applications**

Once the steel is made, it has to be transformed into different shapes such as ingots, slabs, blooms, billets or structural profiles. Continuous casting is the most common process since 1950 when degasification of steels was improved which avoids vibration and perforations in the steel. The efficiency of this process is around 95%, much bigger than traditional casting.



ConCast Cooled Rolls (FAR 30938)

- Abrasion + Temperature
- Turn key solution
- DO\*05



Transport rollers (FAR 2887)

- Thermal fatigue + Abrasion
- EnDOtec wires





Pinch roller (FAR 2842)
Abrasion + Thermal fatigue
EnDOtec wires

• DO\*04



Transport rollers (FAR 15477)

- Abrasion + Temperature
- EnDOtec wires
- DO\*05

# HOT ROLLING MILL



### Descaling case for slabs (FAR 30740)

- Erosion + Impact + Corrosion
- EnDOtec wires
- DO\*11



Pump for descaling slabs (FAR 3350)

- Cavitation + Erosion
- EnDOtec wires
- CAVITEC GMA

### PRIMARY FORMING >



### **Our applications**

The semifished products obtained after the continuous casting process have to be shaped before being comercialized. The first of these processes is hot rolling, from which sometimes final products are obtained and other times semifinished products intended for cold rolling or coating.

One can see above several worn components such as rollers, guides, cutting blades, bearing houses, pumps, etc. our technical specialists can offer a customized solution for your wear.



Bearing house(UK\_M1\_0176)

- Metal-metal friction
- CastoMag wire

• 45553



Billet cutting blades (FAR 30705)

- Impact + Friction + Temperature
- Manual electrode
- 6800



Forming structural profiles (FAR 2383) • Friction + Pressure + Temperature • EnDOtec wires • DO\*04



Entrance guide box 2 (FAR 2654) • Abrasion + Temperature

- EnDOtec wire
- DO\*06



Entrance guide (IT\_M1\_0116) • Abrasion + Friction + Temperature + Corrosion

• 4666 CDP ®

# COLD ROLLING MILL



Bearing house (FAR 2874)

• Friction

- Manual electrode + Arc Spray
- 27 + 42012



Drawing shaft repaired (FAR 26519) • Mechanical fatique

- EnDOtec wires
- DO\*622 S

### PRIMARY FORMING >



### **Our applications**

After hot rolling, many steel products undergo further processing in the cold state. This stage of processing does not alter the shape of the steel product, but it does reduce it in thickness and significantly improves its performance characteristics. Hot rolled coil is commonly cold rolled (also known as cold reduced). The strip is first de-coiled (uncoiled) and then passes through a series of rolling mill stands which apply pressure to the strip and progressively reduce its thickness -down to as low as 0.15 mm. The strip is then recoiled.



#### Drawing machine (FAR 26535)

- Metal-metal friction
- GAP
- 16006



Straightening rollers (FAR 4491)

- Friction + Abrasion + Impact
- Laser cladding
- LC8



Granty crane (FAR 2069)

- Friction + Pressure
- EnDOtec wire
- DO\*23



Knuckle Rolling mill (FAR 2871)

Friction

- Manual electrode + Arc Spray
- 75 + 42012



Straightening rollers (FAR 29948)

- Friction + Abrasion + Impact
- EnDOtec wire
- DO\*15

# **IRON & STEEL MAKING – COOLING**



Transport cooler (FAR 1849)

• Metal-metal friction

• EnDOtec, Arc spray

• DO\*363 + Arc 595

### STEEL MAKING>





Cooling grate (NO\_M1\_0041) • Abrasion + Temperature

- EnDOtec wires
- DO\*04 +DO\*15



#### Transport rollers (FAR 29941)

- Metal-metal friction
- CastoMag wire

#### • 45353

### **Our applications**

In all rolling processes, cooling the steel is a critical factor. The speed at which the rolled product is cooled will affect the mechanical properties of the steel. Cooling speed is controlled normally by spraying water on the steel as it passes through and/or leaves the mill, although occasionally the rolled steel is air-cooled using large fans.



Corrugated bars cooling channel (FAR 1837)

- Abrasion + Temperature
- EnDOtec wires
- DO\*326



Transport rollers (FAR 2886)

- Abrasion + Temperature
- EnDOtec wires
- DO\*04



- Train cooling rollers (FAR 29943)
- Metal-metal friction
- EnDOtec wires
- DO\*15



Cooling bed entry bars (FAR 2850)

- Metal-metal friction + Impact
- TeroMatec wires
- 3205 TM

# **Our Core Competencies**

Castolin Eutectic is a worldwide leader of application solutions in maintenance, repair and wear protection for more than 100 years. To fully cater for industry needs, we specialize in several technologies including Welding, Brazing, Coating and Castolin Services workshops.

We employ more than 1,500 people worldwide in over 100 countries. Our motto is: Quality, Service and Technical Leadership = Customer Value Added.

More than 700 Application Specialists care for you all over the world. Their tasks: Helping you to improve the lifetime of machinery and equipment, to save scarce resources and to provide cost saving solutions for your maintenance needs.



Welding Technology



Brazing Technology



Welding Equipment



**Coating Technology** 



**Castolin Services** 





Heat & Corrosion





# Wear protection experts

Wear phenomena costs money, especially in lost production downtime, replacement parts, repair and ongoing maintenance. At Castolin Eutectic, we take the time to study industry specific Wear phenomena because only when the nature of the wear is fully understood, can the correct solution be proposed. We have proved for over a century that preventive maintenance coating programs can extend the life of vital machine parts by as much as 500%.

Classical Wear phenomena that occur in industry are :



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### Your resource for protection, repair and joining solutions

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