



Key Industry Program

Vertical Roller Mill (VRM)

Stronger, with Castolin Eutectic





We are

Castolin Eutectic is a worldwide leader of application solutions in maintenance, repair and wear protection. More than 100 years of experience in welding, brazing and thermal spraying technologies stand for professional and innovative protection, repair and joining solutions.

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 productivity of machinery and equipment, to save resources, and to provide solutions for your needs.

Erosion



Impact



Heat & Corrosion



Abrasion



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 :

- Abrasion
- Impact
- Heat
- Cavitation
- Erosion
- Friction
- Corrosion

Global Industry Team

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, automotive, power, oil, waste & recycling, etc.

Castolin Services Workshops

Our mission is to develop applications and solve customer problems. Castolin 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 be undertaken either 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 batches of 10 to 100,000 parts per year. Based upon hundreds of successful applications approved by our customers across the globe, Castolin Services can provide optimized solutions combat costly wear degradation of your equipment.



Documented Knowledge

The unique applications database of Castolin Eutectic



TEROLINK

The technical details of Castolin Eutectic’s world-wide case studies are available in most industrial locations where Castolin Eutectic is present, with more than 9,000 fully documented applications for immediate call-up in our multilingual TeroLink® system.

Each case study includes photographs, technical data, detailed descriptions of the adopted solutions and how they were applied, plus considered alternatives and cost-saving analyses where appropriate.



Castolin Services - On-site



Mobile container...



... with equipment for on-site jobs

Castolin Mobile Services arrives with fully equipped mobile units offering an optimal on-site service with lightweight state-of-the-art welding machines, Castolin Eutectic's own power distribution, Frequency controller, auxiliary drives for roller and table and wire transportation with a reach of up to 25 metres. Integrated computer-controlled X-Y-Axis for torch movement and semi-automatic welding mode come to combine this Advanced High Speed VRM Repair Concept mobile package.



Feeding system

Loesche mill 56.4

Preliminary dye penetration tests are a feature of the VRM repair concept. Along with fume extraction to protect the operators, security is paramount throughout with continuous verification of welding parameters and an automatic shut-down feature of the system in case of errors (e.g. breakdown of the hydraulic support of the table bearing – system automatically stops table rotation and welding). This level of automation and control allows Castolin to weld both rolls and table simultaneously, which gives a considerable time advantage. The number of rolls are only limited by the electrical power supply at the customer site.

Castolin is certified according to ISO9001 and ISO 14001 and all regulations stipulated by OHSAS 18001 are adhered to. The Safety Certificate Contractors (SCC) accreditation is also available.

Loesche mill LM 46.2+2, 2 rolls and the table welded simultaneously



Pfeiffer mill MPS 4150, 3 rolls and the table welded simultaneously



Polysius Quadropol, 4 rolls and the table welded simultaneously



Castolin Services - Workshop

Castolin Services Workshops have gained experience of welding wear parts for Vertical Roller Mills since the early 90s. Today we have 7 Castolin Services Workshops worldwide, which are able to deliver in house solutions with State-of-the-Art equipment. A high grade of automation guarantees a constant quality level of the coatings and accordingly excellent and reproducible performance of the wear parts. Exact rebuilding of the missing wear profile with high performing, in house developed cored wires is the main target.

All Castolin Services Workshops are wholly owned by Castolin and are managed to the highest standards of safety and environmental concerns, with trained Castolin staff and standardized written procedures.

Multiple turning units for bandage welding



Coating with PTA welding



Automated welding of continuous casting roller



Regeneration of table segments up to 50 tons



Our innovations

Today, a key concern of any cement plant is the availability of the critical processing equipment, particularly crushing and grinding machines. The down time during refurbishment is a major cost, and there is continual pressure to reduce this time and permit the plant to return to full production status. Castolin Eutectic have responded to this call, from both local and international concerns, and initiated a development program to address this necessity.

The whole on-site welding operation has been studied and a new Advanced High Speed Repair Concept developed. This concept is based on a comprehensive approach to VRM and includes advanced welding equipment technology, application developed welding consumables, advanced automation and data logging, multi head control, modern logistics and a dedicated VRM package and team.

This Advanced High Speed VRM Repair Concept, which started in 2009, delivers to Industry today the highest grinding performance and the fastest refurbishment speed - 36 hours for 3 or 4 rolls and a table. Occasionally this concept even totally avoids any kiln stoppage if the customer has the possibility to store the needed or produced material temporarily. Final results provide a higher grinding capacity as well as a reduction of mill energy consumption. The avoidance of having to weld thick wear facing deposits also implies less risk for clients during operations as such coatings may spall.



For cement grinding, significantly refined levels are needed compared to raw material grinding where coarser particles are stabilising the bed. The aerated fluidised bed on the rotating table has to be compressed and de-aerated before it can be grinded efficiently. Castolin has therefore developed a flexible control system where even complex geometries of the final weld overlay bead profile can be programmed.

Table of Alstom coal mill



Roller Bandage for Loesche Mill



Rollers Bandages of Loesche Mill grinding petcoke

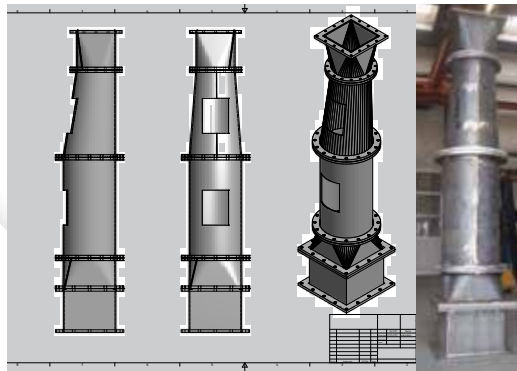


Our applications

Based upon hundreds of successful applications approved by our clients across the globe, Castolin Eutectic can provide optimized solutions with a wide range of products and technologies to combat wear in VRM (Vertical Roller Mill) and many more. Castolin Eutectic has a detailed understanding of the industries where this equipment is used, of every major wear problem and can provide industry-tested application solutions.

From the extreme cold of Russia to the heat of Brazil and Mexico, we have a deep knowledge of application solutions for the wear problems in this industry. Innovative technologies and equipment help major industrial Groups to meet their objectives in terms of increased life time and plant performance.

Preventive wear protection of cone crusher



Engineered wear parts manufactured from CDP

On-site repair of Roller Press



Crack repair of Ball Mill



Crusher with PTA wear facing



Our applications especially for Vertical Roller Mills



Vertical mill for slag protected with CDP®



Coal mill cone repairs with CDP®



VRM wall with CDP®



Separator blades made from CDP®



Chutes made from CDP®



Separator discs made from CDP®



Walls made from CDP®



Repairing rollers with MTC 8338



Nozzle ring segment with NanoAlloy protection



Dam rig protection



Air guide cone clad with NanoAlloy



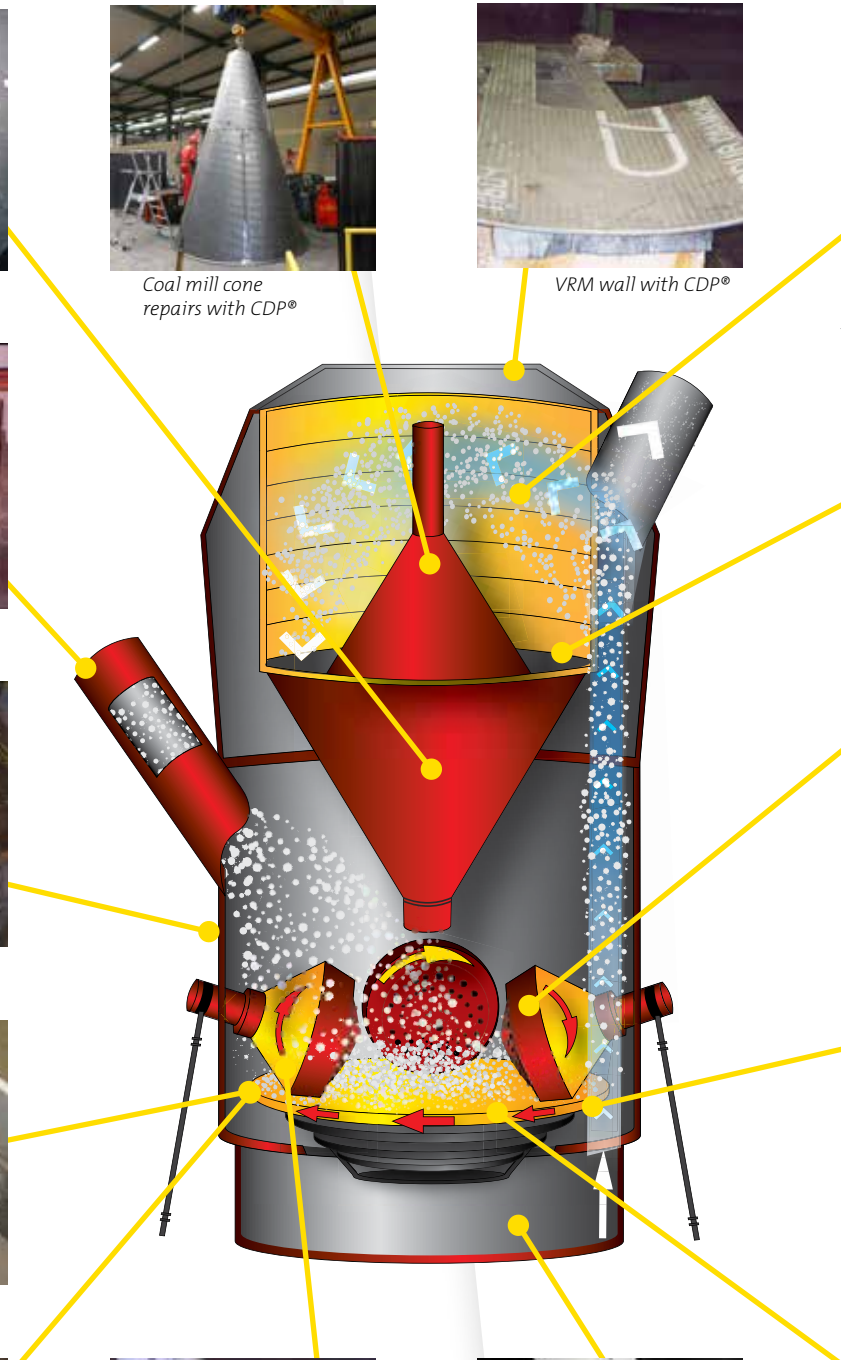
Cone protector



Scraper arm



Repairing table with MTC 8338



Our long experience with Vertical Roller Mill repairs

In the 1970s, Vertical Roller Mills (VRMs) became increasingly dominant for grinding raw materials, mainly for the cement and power industries, due to their high energy efficiency and excellent drying capacity. The VRM's function is to crush the materials into very fine particles, just prior to being stored or after the primary crushers. The VRM components are subjected to severe wear which can increase dramatically when high silica content is found in the raw materials or where mills are grinding slag. It is known that the largest area of energy consumption in manufacturing cement is in the finish milling process. Consequently such wear problems can significantly influence the profitability of a plant. A worn VRM roller profile also reduces grinding efficiency, increasing energy demands further.



Checking the welded profile of a Loesche finishing mill

Excellent references

During the last decades, together with our partners, we have proved that preventive maintenance on VRM can extend the critical component lifetime by as much as 100%. Such maintenance operations have been performed on over 2000 units in more than 24 countries, with 80% being on-site repairs but also many in our workshops. Our specialists are highly experienced and flexible having repaired over 40 different VRM models for more than 30 cement companies throughout the world since the early 90s. Castolin Eutectic has successfully worked on equipment for Polysius, Loesche, FLSmidth, Gebr. Pfeiffer, PSP Engineering, Alstom and KHD along with well-known international cement companies such as Holcim, Heidelberg, Lafarge, Cemex, Buzzi Unicem and many others.



voestalpine



Wear analysis - R&D Laboratory

The Castolin Research and Development (R&D) centres are well equipped to resolve the most complex wear phenomena affecting the milling and grinding industry. The main Castolin R&D centres involved in optimising the welding consumables and methods of applying the welding deposits are in Austria and Ireland. For example our manufacturing plant in Ireland not only has an automated Micro Hardness Machine, G65 abrasion wear testing machine, ICP and XRF chemical analysis units, but also employs a well-trained and customer orientated technical team of experts.

Wear simulation test machine



In house cored wire production with State-of-the-Art machines

The MTC (Mill Technology Coating) range of high performance cored wires are all formulated, developed and manufactured in Castolin Eutectic's own modern plant in Ireland using specially designed production equipment. The plant has 6 wire lines and continues to invest in the latest production machines, utilising laser controls for dimensional and fill measurements. The wire lines are installed in a purpose built, green field plant that opened in 2007 and employs around 100 people in manufacturing and quality control. The special filler powder alloys for cored wires is produced there as well.



All quality data is logged electronically and fed into a new computer-based quality assurance system that retains all manufacturing, wire property, chemistry and batch information. All batches are weld tested and samples are stored for 5 years.

New materials development

Providing complete solutions for VRM maintenance with performance improvement is our goal. Thanks to our R&D department and the long experience in maintaining mills, we have developed special products providing unbeatable wear resistance e.g. the TeroMatec 8355 and 8338.

Skills and knowledge of Castolin Experts have enabled us to create a range of overlay materials combating the widest combination of wear types. This range is continuously growing, as we harness new materials to provide better solutions to existing problems as well as answers to new challenges. The results of this extensive work are demonstrated by the hundreds of patents registered by Castolin in the areas of wear protection and fusion technologies during its more than 100 year history.





Our Service Teams world wide - Close to your mills

Customer Oriented Growth: Thinking Globally

The “Advanced VRM and Roller Press Repair Services” are only available through the Castolin Eutectic Service Centres. These are currently established in Austria, Brazil, Egypt, Mexico, Russia, Spain and the United Arab Emirates, but the Advanced High Speed VRM Repair service is available today throughout Europe. The specialisation offered via the Castolin Services international network ensures that the quality level offered to clients is consistent.

Castolin Eutectic’s VRM service package includes worldwide knowledge, a wide range of innovative products to solve the wear problems, on-site and workshop refurbishment possibilities, increased service life over conventional welding alloys, fast and effective return to service and improved grinding performance after grinding. Since 2009, Castolin has developed its Advanced High Speed VRM Repair Concept and rolled it out globally with success. Over 70 jobs completed in 14 countries and a recent record; the completion of a VRM repair of 3 rollers and a table in 36 hours applying up to 1.350 kg of welding material.

Product Range

The Castolin Eutectic has been a pioneer in developing solutions for maintenance and repair to OEM’s - Original Equipment Manufacturer - and we have a wide range of processes available to our customers.

Our product range combines quality with high performance and is easy to use. We offer 5 different technology solutions:

- Welding: cored wires and flux coated electrodes
- Brazing: consumables with tungsten carbide base
- Coating: equipment and consumables for metallization
- Wear Plates: ready for use and specifically designed plates
- Welding Equipment: Inverters, Rectifiers, TIG, MIG / MAG, PTA and Plasma Cutting.

Product Range - Widest in the Industry



Stronger, with Castolin Eutectic



Your resource for protection, repair and joining solutions

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