



www.me-elecmetal.com



- Grinding Mill Liners
- Rubber and Composite Mill Lining Solutions
- Grinding Media
- Crusher Wear Parts
- Smelter Ladles and Slag Pots



Innovative Solutions... Proven Performance...

ME Elecmetal is the leading global supplier for total solutions in the mineral processing and other target industries.

We help mineral processors increase productivity and reduce downtime by developing the most cost-effective products and services.

Future performance of processing equipment depends on decisions made (or not made) at the time of original purchase. ME Elecmetal works closely with end users, engineering firms and manufacturers of grinding mills and crushers to develop optimized liners for their specific needs.

Our products and services include:

- Grinding mill liners (steel, rubber and composite)
- Grinding media (balls and rods)
- Crusher liners
- Ladles, slag pots and other large specialty castings
- Ground engaging tools (exclusively for South American market)
- Machine shop services (exclusively for South American market)
- 3D laser scanning for wear analysis
- Reline simulation services
- DEM and FEM simulation services



Who we are...

At ME Elecmetal we are building a vision of the future, searching for improvements and growing with our customers.

1917

- Compañía Electro Metalúrgica (Elecmetal) installed the first electric arc furnace in Latin America.
- Minneapolis Electric Steel Castings (ME) installed one of the first electric arc furnaces in North America.

1959

- Elecmetal establishes a strategic alliance with Oregon, USA based Esco Corporation to design and manufacture high quality ground engaging tools.

1960's

- ME specializes in through hardened impact and abrasion resistant castings for the mineral processing industry.

1970's

- ME was sold to Evans Products Co.
- Elecmetal became part of Grupo Claro.

1976

- ME built a new greenfield foundry in Duluth, MN using vacuum molding.

1987

- ME was acquired by the joint venture of Armco, Inc., Pittsburgh, PA and Stelco, Inc. of Hamilton, Ontario. A new name was established as ME International.

1992

- Armco Grinding Systems share of ME was purchased by GS Technologies (GST).

1994

- ME International purchase Capital Castings, establishing a new company called ME West Castings, Inc.
- GST purchase the remaining half of ME International.

1995

- GST merges with Georgetown Industries. ME International becomes ME International Inc.

2001

- Elecmetal purchases ME International Inc., and ME West Castings, Inc. establishing ME Global Inc.

2003

- ME Elecmetal brand was created.
- ME Elecmetal purchases 60% of Fundición Talleres Ltda., a foundry and machine shop (formerly owned by Codelco) located in Rancagua, Chile.

2007

- ME Elecmetal acquires remaining 40% of Fundición Talleres Ltda.
- ME Elecmetal and Esco Corporation form a joint venture dedicated to the manufacture of ground engaging tools for the South American market.

2011 - 2013

- 2011**
 - ME Elecmetal signed a joint venture with Changshu Long Teng Steel Co., Ltd. to manufacture premium quality grinding media in Changshu, China.
- 2012**
 - The new ball plant ME Long Teng Grinding Media (Changshu) Ltd. starts operations.
 - The new foundry Esco-Elecmetal Fundición Ltda. starts operations.
- 2013**
 - Greenfield construction begins for a new mill liner foundry located in Changzhou, China.

2014 - 2016

- 2014**
 - ME Elecmetal (China) Co. Ltd. starts operations in Changzhou, China. The new foundry will produce 30,000 metric tons of mill liners.
- 2015**
 - Upgrade of the Rancagua foundry starts. Thanks to this modernization project, the Rancagua foundry will double its capacity.
- 2016**
 - Commissioning of the new Rancagua foundry. The new facility will add 36,000 metric tons of capacity in the form of mill liners, crusher parts and other large specialty castings.



Grinding Mill Liners Mill Lining Solutions

ME Elecmetal knows mill liners. We are the world leader in designing and supplying highly engineered grinding mill liners and total liner systems. Our innovative liner designs and proven alloys maximize mill performance and availability while minimizing costly down time. We also know that our job doesn't stop after we ship them. Our sales engineers work closely with mill operators and maintenance personnel to monitor wear and customize each liner for maximum performance.

Grinding wear parts are subjected to different combinations of impact and abrasion, as they are used in SAG, ball or rod mills. ME Elecmetal Sales Engineers work closely with customers to determine the optimal liner design, alloy selection and hardness, for each unique application. Our wear parts are manufactured to the highest standards of quality, traceability and delivery, ensuring highest levels of reliability and productivity for our customers.

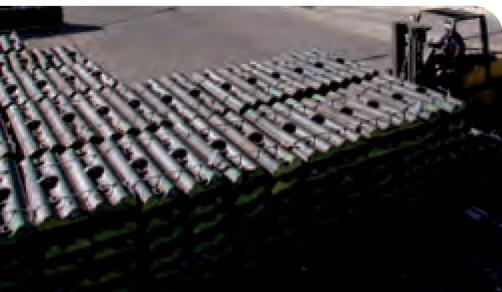
ME Elecmetal delivers the broadest range of chrome-moly steel and white iron mill liners using state of the art foundry and engineering technologies.





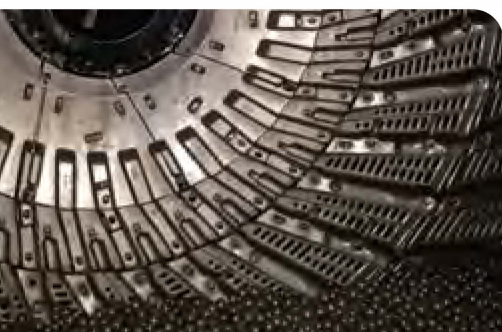
Successful liner design begins before grinding mills are manufactured:

At the new project stage of development, ME Elecmetal will provide total liner project coordination. We work closely with the grinding mill supplier, engineering contractor and mill end user at every phase of liner development. Our sales engineers provide valuable insight based on years of ME Elecmetal experience, including optimizing mill shell drilling patterns to guarantee fit.



Integrated grinding solution from one source:

ME Elecmetal offers a total grinding solution. Liners and balls are designed and sized to maximize mill performance. Total liner fastener kits can be color coded and shipped with the liners, allowing for improved efficiency during liner installation as well as and eliminating any potential for delays due to warehousing confusion. We work closely with liner handler manufacturers to assure safe and easy liner installation and removal.



More than mill liners:

We offer mill operators valuable tools and innovations to optimize their liner systems. ME Elecmetal's patented Discharge End for SAG mills helps prevent the shifting of massive grates and dischargers. The ME Elecmetal "Wedgit" prevents mill shell racing between liners. We've developed a unique "One Point Wear and Performance Tracking" program that operators around the world can use to help determine wear life and liner change out dates, as well keep detailed records of the results of liner design changes. Other services provided by ME Elecmetal for increasing mill efficiency and availability are: 2D and 3D simulations, early alert services, and on-line grinding media applications.

Our grinding mill solutions include:

- Wear parts for SAG mills
- Wear parts for AG mills
- Wear parts for ball mills
- Wear parts for rod mills
- Discharge End Systems (patented)
- Wedgit (patented)
- Liner fasteners
- Liner handlers
- One Point Wear and Performance Tracking
- Online grinding media applications (ME Elecmetal Grinding Media Apps)



ME PolyFIT

Rubber and Composite Mill Lining Solutions

ME Elecmetal is a world leader in designing and supplying rubber and composite grinding mill liner solutions. Our innovative liner designs deliver proven performance and availability while minimizing costly down time. Our sales engineers work closely with mill operators and maintenance personnel to monitor wear and customize each liner for maximum performance.

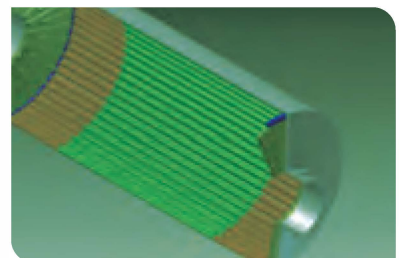
ME PolyFIT Rubber Mill Liners:

Ball Mill Linings:

- Feed liners
- Discharge liners
- Lifter bars
- Shell plates
- End plates
- Grate plates
- Throat liners
- Corner fillers
- Fastening systems

Applications:

- Ball mills
- Pebble mills
- Regrind mills
- Scrubbers



Features	Benefits
<ul style="list-style-type: none"> • Less weight • Less downtime • Less noise • Leak-proof fastening systems • Long wear life 	<ul style="list-style-type: none"> • Increase life of rotating parts • Higher availability • Reduced noise pollution • Less cleanup - corrosion • Lower cost per ton of grinding



Ball Mill Rubber and Composite Lining Solutions

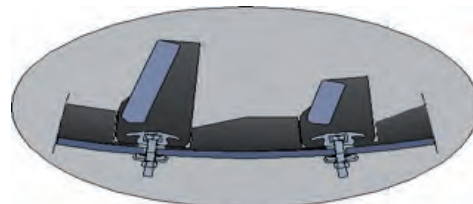
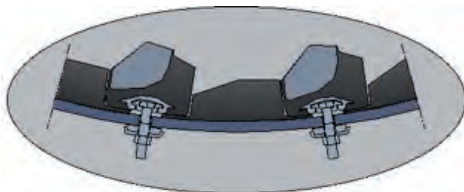
ME PolyFIT Composite Mill Liners:

Composite Ball Mill Linings:

- Lifters - Hardened steel faces
- Lifters - Cast steel faces
- Rubber - Steel shell plates
- Rubber - Steel end plates

Applications:

- Primary ball mills





Grinding Media

ME Elecmetal designs, manufactures and supplies premium quality forged steel grinding media for SAG and ball mills.

Why choose ME Elecmetal grinding media:

- We use the highest quality raw materials for manufacturing our grinding media.
- Quality Management System certified ISO 9001:2008.
- Occupational health and safety management systems certified OSHAS 18001.
- Environmental management system certified ISO 14001.
- Rigidly managed forging process ensuring spherical ball shape.
- High end heat treatment technology, based on ME Elecmetal's years of metallurgical experience guaranteeing long wear life.
- Streamlined supply chain infrastructure (20 distribution centers worldwide, located close to customer base and more being added).

ME Elecmetal has the capacity to deliver premium quality forged grinding media in sizes ranging from 22 mm to 160 mm (0.88" to 6.25" aprox.) and in three product lines:

- **ME Super SAG®**: Designed for maximum productivity and low operating and maintenance costs in SAG mills.
- **ME Ultra Grind®**: Designed for maximum productivity and low operating and maintenance costs in secondary milling.
- **ME Performa® II**: Designed for maximum productivity and low operating and maintenance costs in secondary milling.



ME Super SAG® grinding media
100-160 mm (4" - 6.25" aprox.)

Chemistry

Limits	C	Mn	P (max.)	S (max.)	Si	Cr	Mo (residual)	Cu (residual)
Upper limit	0.90	1.02	0.022	0.022	0.40	1.05	0.15	0.15
Lower limit	0.70	0.80	-	-	0.20	0.70	0.03	-

Hardness (HRC*)

Series	Surface (min. - max.)		Volumetric (min. - max.)		Applications
HH Series	60	64	58	62	Mills with controlled ball to liner impact
S Series	58	62	56	60	Normal milling operation
T Series	54	60	54	60	Mills with higher chance of ball to liner impact

ME Ultra Grind® grinding media
40-100 mm (1.5" - 4" aprox.)

Chemistry

Limits	C	Mn	P (max.)	S (max.)	Si	Cr	Cu (residual)
Upper limit	1.00	1.00	0.025	0.025	0.30	0.5	0.15
Lower limit	0.80	0.80	-	-	0.20	0.4	-

Hardness (HRC*)

Series	Surface (min. - max.)		Volumetric (min. - max.)		Applications
ME Ultra Grind	60	65	60	64	Ball mills

ME Performa II® grinding media
22-100 mm (0.88" - 4.00" aprox.)

Chemistry

Limits	C	Mn	P (max.)	S (max.)	Si	Cr	Cu (residual)
Upper limit	1.00	0.95	0.035	0.035	0.40	0.60	0.15
Lower limit	0.80	0.60	-	-	0.15	0.40	-

Hardness (HRC*)

Series	Surface (min. - max.)		Volumetric (min. - max.)		Applications
ME Performa II	60	64	60	64	Ball mills

HRC*: Hardness Rockwell
 HH: High hardness
 S: Standard
 T: Tough



Crusher Wear Parts

Wear components for crushing processes are subjected to severe impact and high abrasion, requiring solutions made from high strength and abrasion resistant alloys.

ME Elecmetal is the leader in offering wear solutions to crusher operators. We provide wear parts for primary, secondary and tertiary crushing applications for the mining and aggregate industries with optimal designs and alloys specifically developed for each application.

We increase crusher availability and productivity through:

- Superior wear materials resulting in increased wear life
- Optimal crushing profiles through optimized liner designs
- Designs and tools for safe and efficient concave change out



ME Elecmetal through hardened alloy concaves for maximum gyratory crusher up-time:

Our metallurgists were the first to successfully develop through hardened alloy steel to replace traditional Hadfield manganese. Our design engineers worked closely with end users to develop the “locking pin” concept to hold in concave segments. We also work with major crusher manufacturers to develop safer lifting techniques for concaves. Our concaves:

- Significantly increase wear life
- Eliminate the need to “scarf” concave joints
- Require no “key” concave
- Use locking pins for ease of installation
- Use drilled and tapped inserts for safe lifting

Our products and services for primary crushing includes:

Gyratory crushers:

- Through hardened alloy and manganese concaves
- Mantles; one, two and three piece
- Under crusher parts
- Rim liners
- Spider caps and arm guards
- Epoxy backing material
- Optimized crusher profiles
- Oversize mantle designs for sequencing of mantles
- Designs optimized for quick installation and removal
- Change-out forecast
- Spare parts inventory management
- Premium manganese steel in 14%, 18% and 21%

Jaw crushers:

- Jaw plates
- Side plates
- Wedges
- Full range of tooth styles
- Optimized jaw tooth profiles
- Premium manganese steel in 14%, 18% and 21%

Our products and services for secondary and tertiary crushing includes:

Cone crushers:

- Bowls
- Mantles
- Torch ring
- Epoxy backing material
- Optimized cone cavity profiles
- Premium manganese steel in 14%, 18% and 21%





Smelter Ladles & Slag Pots

ME Elecmetal has the capacity to manufacture equipment and spare parts for smelters, including smelter ladles and slag pots up to 200 tons.

ME Elecmetal has developed a wide range of smelter ladle and slag pot designs for hauling molten metal between the different stages in the copper smelting process (matte, white metal, blister copper, slag).

Smelter ladles and slag pots are manufactured application specific to match the needs of our customers. ME Elecmetal provides a wide variety of shapes and sizes adapted to each specific application. Application specific designs minimize potential for deformation from thermal and mechanical forces which helps assure safer use throughout the products life cycle.

Our cast steel ladles and slag pots are manufactured to the highest quality standards offered in ASTM and proprietary cast steels

ME Elecmetal cast steel ladles and slag pots offer high impact resistance, low fracture tendencies, easily weldable, with low deformation characteristics.



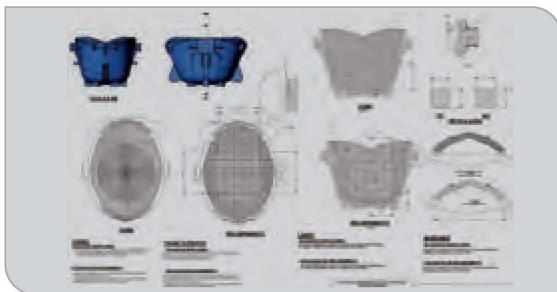
To assure maximum quality and service life, all our smelter ladles and slag pots are manufactured to the highest quality control standards, which include:

- Solid modeling
- FEA analysis
- Complete visual inspection
- Dimensional verification
- Ultrasonically tested
- Magnetic particle tested

Engineered Design

Taking advantage of our own experience as a manufacturer and end user of ladles and pots, we have the expertise to offer our customers the best choice to increase the service life through design improvements.

ME Elecmetal is the preferred supplier of smelter ladles and slag pots.





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