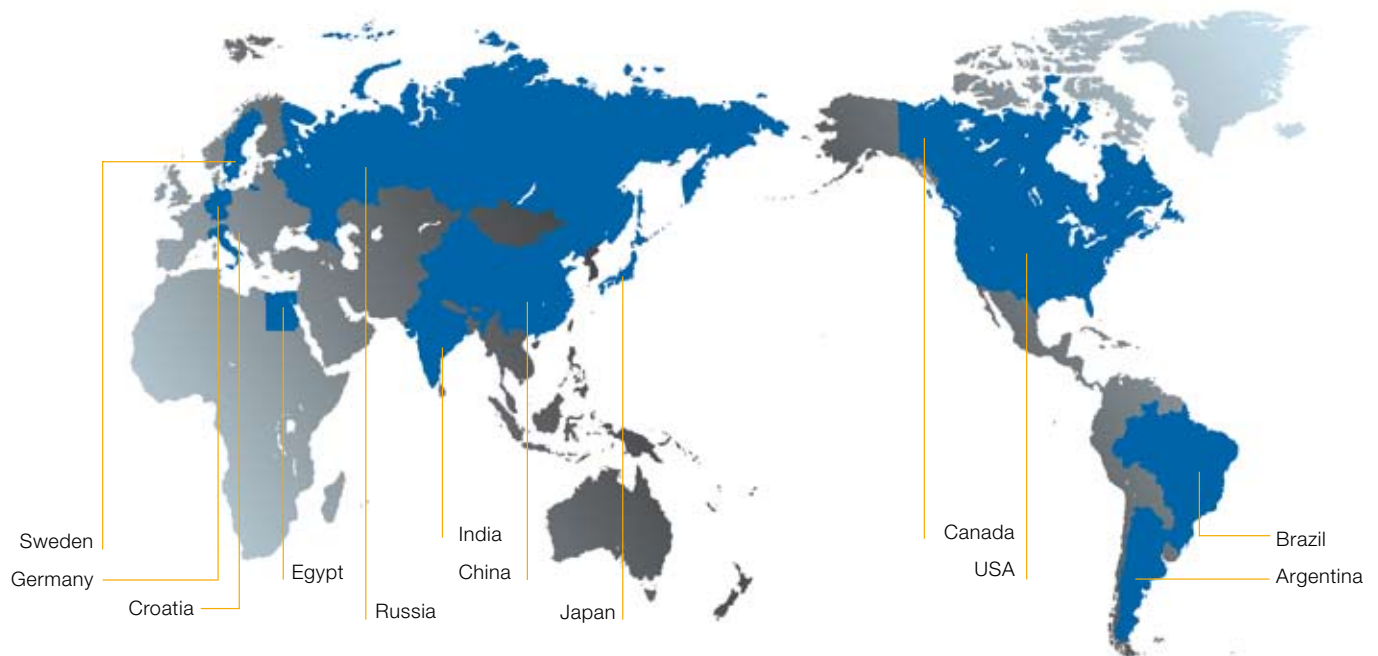


ABB in Metals

Helping our customers boost productivity
while conserving energy

Energy efficiency and productivity through leading technology solutions – worldwide



Global sales and project execution network

As one of the world's leading engineering companies, our mission is to help customers improve their operating performance, asset reliability and productivity whilst saving energy and lowering environmental impact.

In order to serve today's globalizing metals market, the "Business Unit Metals" is a pioneer within the ABB group as the first truly global system organization with one global sales, one global operation, one global service and one global R&D force.

The main focus is to provide ferrous and non-ferrous metals producers with leading technology solutions for primary metals, profile mills, tube and pipe mills, hot flat mills, tandem

cold mills, cold rolling mills, processing lines as well as metallurgy products. Together with other business units within ABB group we offer integrated solutions and products for the entire value chain. Reliable instrumentation and control systems, advanced drive technology, power technology, energy management as well as services – all from one single source.

ABB metals – your partner

Over 1400 employees in more than 40 countries
Over 100 years of process knowledge in metals industry
ABB supplies the global metals industry in excess of 1 billion \$ per year

Commitment to the success of our customers



Christer Skogum
Business Unit Manager

"With one global sales force, one global operation and one global development team, combined with ABB's vast worldwide service force, we offer our customers the most cost effective solutions based on our extensive application know-how and lifecycle partnership commitment to bring reliability, efficiency and productivity to our customers' complex metal processes."

Ferrous or non-ferrous, ABB offers complete electrification, automation, drives systems, metallurgy and force measurement products as well as services.

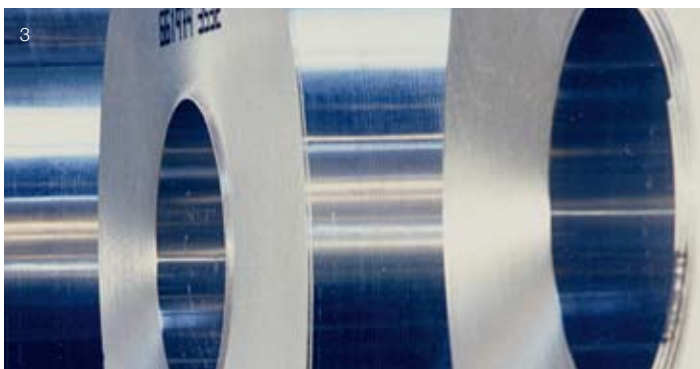
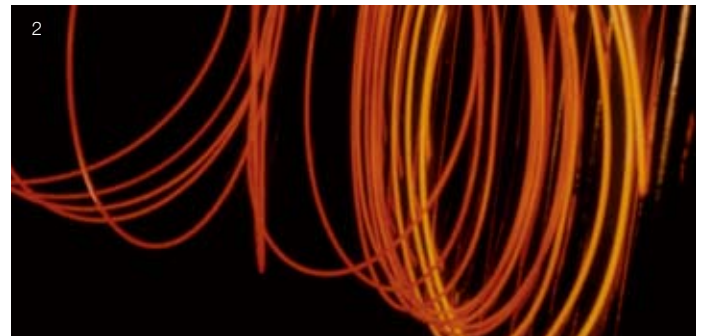
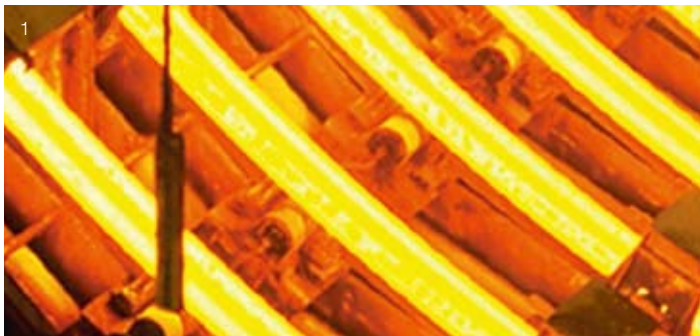
In today's industry, quality and productivity while lowering energy consumption is the main topic for our customers. This means that the demands on efficiency, availability and flexibility of the plants are increasing with each passing day.

ABB metals' reputation is built on a century of pioneering invention, innovation and process expertise. Modern plants and mills rely on sophisticated power equipment, control and drive systems all working in harmony. Our innovative engineers and experienced project managers work closely with ABB's global R&D centers as well as the most renowned customers worldwide to provide leading technology solutions in the metals industry.

In addition our products and systems also help customers to optimize the return on their power and automation investment. Our state-of-the-art automation systems support easy upgrades and expansions while allowing operators to retain parts that can still be used. Our energy-efficient AC drives with Direct Torque Control (DTC) technology help customers avoid wasting energy and reduce CO₂ emissions. Our power systems increase quality, reliability and boost production output. And our advanced lifecycle services help customers squeeze extra value from installed assets by keeping them in top working order.

From primary metals to processing lines

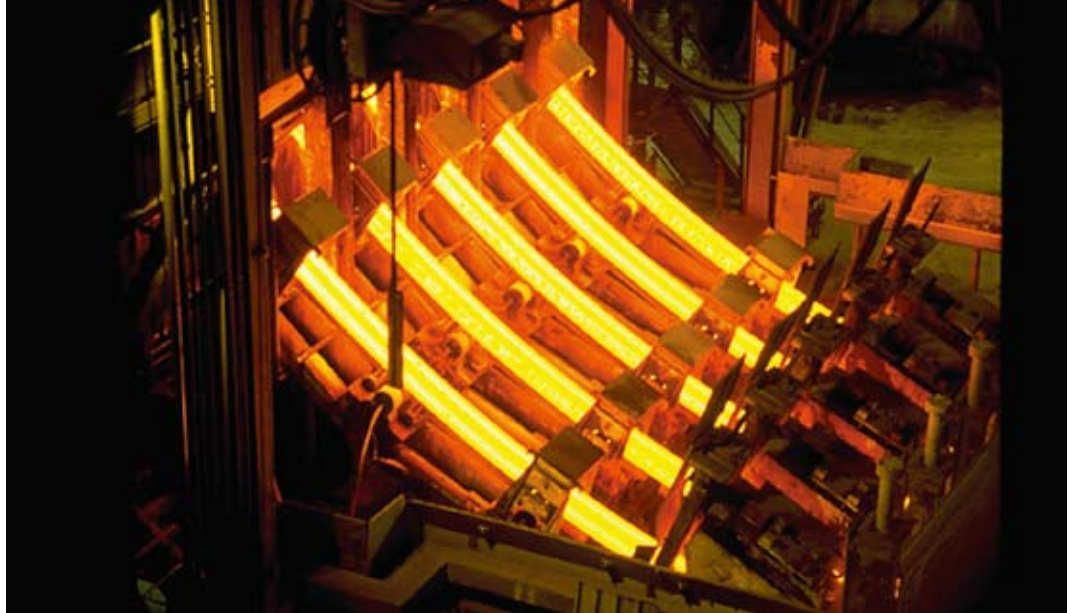
1 Primary metals, from melt shops to continuous casting | **2** Hot rolling mills including profile mills, tube mills and hot flat mills | **3** Cold rolling mills and tandem cold mills | **4** Processing lines



Primary metals – optimized processes



Tata Steel, India



Tata Steel, India: Sinter plant

Tata Steel has put up a new sinter plant at their Jamshedpur works, India for their 1.0 million ton expansion project. Outokumpu, Germany with their local indian partner L&T - ECC division got the turnkey contract for the supply and commissioning of the sinter plant including the electrics, drives and automation. Outokumpu & L&T chose ABB as their partner to supply the DCS package for the sinter plant.

From melt shops to continuous casting – solutions "Made by ABB" .

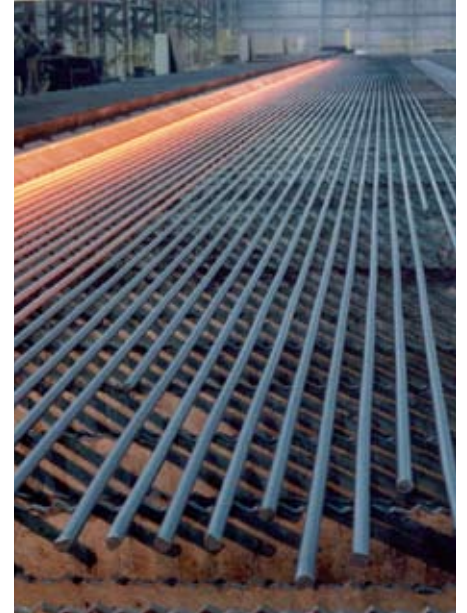
With constantly growing demand for iron and steel and increasing prices for raw materials, energy and transport, it is of vital importance to help plant owners and operators to achieve high plant productivity, high product quality, flexible plant operation, total process supervision, comprehensive reporting as well as operator guidance. ABB is a leading supplier in primary metals, having equipped numerous plants in all parts of the world.

We offer solutions for:

- Raw material yards
- BOF/BOS
- Coke plants
- DRI plants
- Sinter plants
- EAF
- Blast plants
- Continuous casters
- Services plants

ABB's automation technology for blast furnaces include process control, instrumentation, drives, switchgear, MCC, motors, analyzers, weighing, optimization as well as asset management. The basic blast furnace automation products consist of pre-engineered control programs, blast furnace models and expert systems. Our technology is applied to raw material handling, coke ovens, sinter plants, corex and DRI plants, briquetting plants, ladle furnaces, bloom casters, slab casters, cranes, etc.

Hot rolling mills – integrated automation & drives functionality



1 SSAB Tunnbrätt, Sweden: Hot strip mill control system revamp

Replacement of the old control system with ABB's new control system – the result: ease of use and better control to meet the quality and dimensional demands for rolling new high strength steel products.

2 Baosteel Group Seamless Tube Co., Ltd., China:

Revamp of seamless tube mill Update of automation and main drive system of the existing seamless tube production line – the result: improved evenness wall thickness between tube ends and body and higher yield.

From hot flat to profile and tube mills – we provide integrated solutions

ABB is the leading long-term supplier for all kinds of hot flat, profile and tube mills. Our integrated solutions cover the complete scope from electrical equipment, automation and drive systems, technological controls, material tracking to a full range of professional services.

The know-how in technological functions, process models, advanced process control as well as diagnostics allows ABB to guarantee high quality performances in terms of thickness, width, flatness and temperature at best level of productivity.

The dedicated technological control for reliable quality assurance of the rolled plates and strips covers:

- Rollgap control, work roll bending/shifting control
- Automatic gauge and width control
- Roll eccentricity compensation, side-guide control, coiler control

Since the world's first electrically powered rolling mill supplied in 1894 by ASEA (today ABB), a number of innovative solutions and "world firsts" – all combined with dedicated engineers with thorough process know-how – have made ABB an attractive supplier for rolling mills.

Numerous installations worldwide are the strong evidence of ABB's leading technology position in hot flat, tube mills and profile mills.

Hot flat mills

- Roughing mills
- Plate mills
- Hot strip mills and continuous strip production mills
- Steckel mills

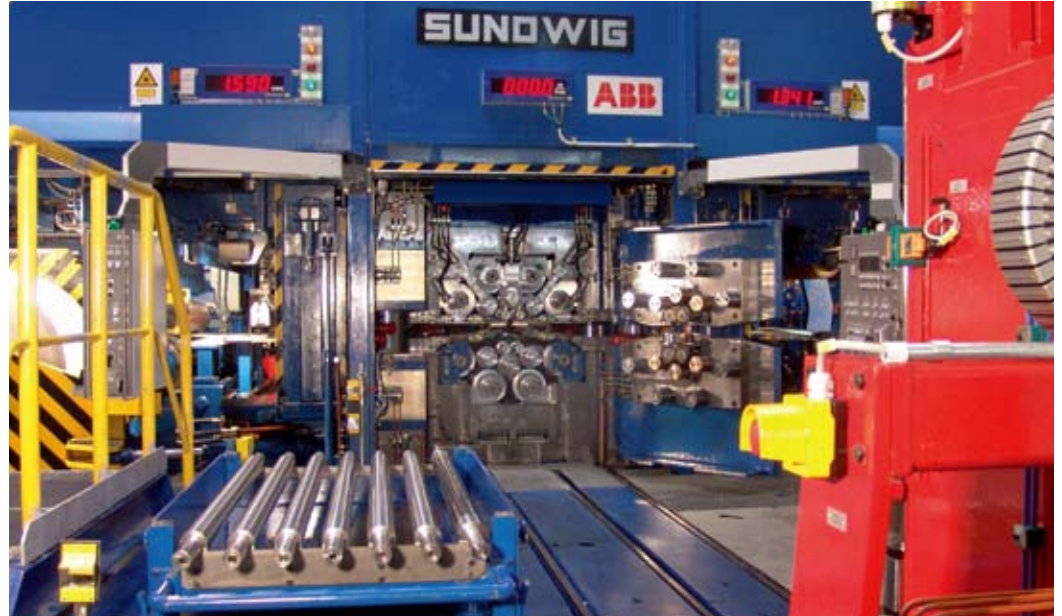
Tube mills

- Piercing mills
- Mandrel mills
- Assel mills and hot pilger mills
- Push bench
- Sizing and stretch reducing mills
- Welded tubes and finishing plants

Profile mills

- Rod and bar mills
- Heavy, medium and light section mills
- Rail and billet mills
- Blooming mills

Cold rolling mills – years of expertise pay off



**1 ThyssenKrupp, Krefeld, Germany:
20-high cold rolling mill for stainless steel**

A new plant with drive systems and process automation, production planning systems, preset models for setup calculation, technological controls – the result: excellent strip quality and high throughput from the startup onward.

2 Arcelor, Eisenhüttenstadt, Germany:

4-stand tandem mill
Modernization of drive system and process automation, production planning system, preset models and technological controls. Minimum revamp down-time due to plant simulations, – the result: minimal off-gauge lengths, improved strip quality and increased throughput.

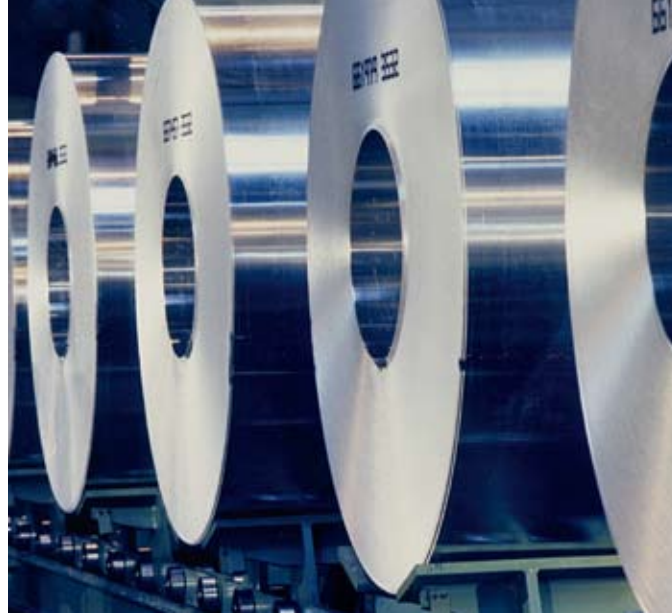
Processes through innovative solutions

The quality of rolled metal is determined by the quality of the technology used in its cold mill processing. Surface characteristics, flatness and strip thickness all need to be perfectly monitored and controlled – in order to produce a perfect product. The perfect match of ABB's products and solutions allows you to achieve extraordinarily high quality and productivity down to the smallest detail, such as the strip thickness control.

Roll@xA - The solution package for maximum productivity and quality

With Roll@xA, ABB offers an innovative solution package to optimize the sophisticated and complex processes of rolling. You have the perfect technical solution that you need for the various rolling processes. It is backed up by our experience from more than 700 cold rolling mills worldwide.

Processing lines – improved productivity through customized solutions



Ningbo Baoxin Stainless Co., Ltd., China
Cold annealing & pickling line
Supplied by DMS, this 180,000 t/y line includes four process sections and three loopers: decreasing section, annealing furnace, pickling sections and skin pass mill. Scope of supply included drive systems based on ACS600 multidrive, AC motors, LV distribution, MCC, level 1 open control system and level 2 management execution system.

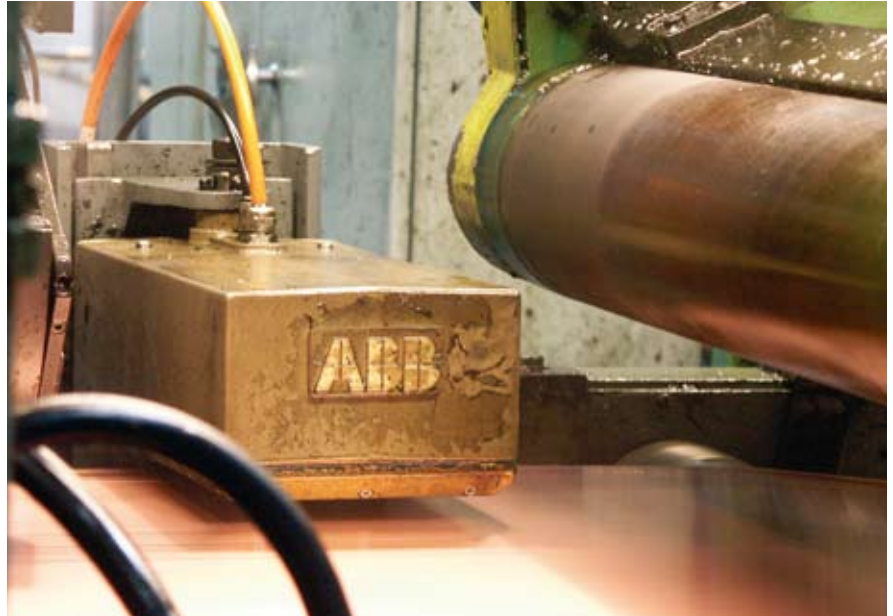
Solutions for automation, drive systems, instrumentation and energy supply
ABB's experience in all kinds of processing line applications like annealing and pickling lines, galvanizing and coating lines, slitting and cutting lines stands for superior plant performance and increased productivity. Line control is one of the key functions - controlling tension, speed and position to very high accuracy and coordination of up to 200 drives.

Collaborative Production Management – bridging the benefits gap

Taking care of a complex core activity
A main manufacturing operations function includes the activities of local planning and scheduling of production and resources. Execution scheduling is more complex in a metals application than in most other industries. It is a core activity. Enterprise-level planning systems often do not have the detailed information required to schedule specific production activities, production equipment, or personnel. The CPM4Metals order handling work process takes care of the production planning of orders which are going to be processed in the application.

- Timely and accurate material tracking
- Casting, process setup and reliable rolling
- Maximum transparency and ease-of-use

Products and services – polished to perfection



In addition to the solutions for electrification, automation and drive systems in the whole value chain, we offer tailor-made products and service packages for the metals industry. Based on years of process knowledge in ferrous and non-ferrous applications, they help to achieve the best results of the production facilities.

Metallurgy products

In metallurgical processing, the technique for stirring and mixing the melt is one of the most decisive factors for higher quality and productivity, lower energy consumption and better work environments. Our electromagnetic products benefit the continuous casting, melting and refining of mainly steel and aluminium.

- Electromagnetic stirrers for arc and ladle furnaces and continuous casting
- Electromagnetic brakes for slab casting
- Electromagnetic stirrers for aluminium furnaces and casting
- Electromagnetic stabilizer for steel strip processing

Stressometer flatness measurement

The Stressometer system measures the flatness with up to

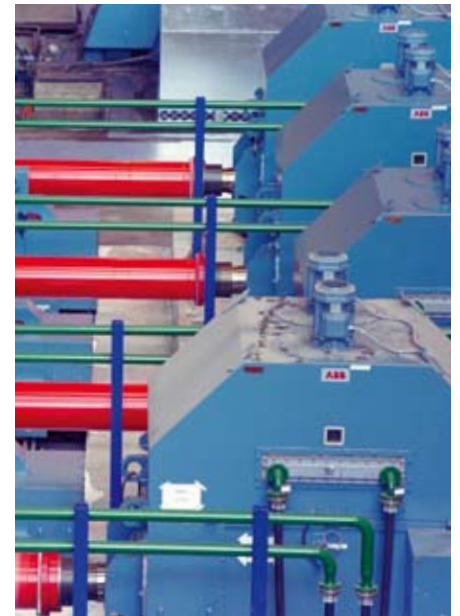
300 measurement points per meter rolled strip, independent of strip speed. The unsurpassed measurement density generates an exact flatness visualization from edge to edge. The new Stressometer seamless roll gives maximum resolution with a minimum of force spreading.

Millmate thickness gauge & millmate roll force and strip tension load cells

The millmate thickness gauging system offers an extended measurement range from 0.01 mm – 10 mm with extreme accuracy. The non-contact and material independent gauge, based on the Pulsed Eddy Current technology, makes gauging simple for thick and thin non-ferrous metals. The millmate roll force and strip tension load cells, based on the Pressductor technology, stand for high performance load cells in extremely harsh environments.

Instrumentation and analytical

Unrivalled in its scope, ABB is a global leader in instrumentation and analytical – certified to international standards and provides a wide variety of measurement products, including field bus technology, and gas analyzer systems, e.g. for emission monitoring.



China Steel Corporation (CSC), Taiwan – Stressometer flatness system continues to boost CSC' s business after more than 17 years in operation

CSC feels that the most important property of the flatness system is the stable operation. This means that very little maintenance has been needed and there have been very few unplanned production stops. Over the years the Stressometer has shown to be very reliable and adaptable, which has made it possible for CSC to further improve the results that were achieved after installing the system in 1991.

Surface inspection

Immediate detection and classification of surface defects for metals strip production lines saves valuable time and production. Reliable and repeatable defect information helps to produce a higher-quality product.

Rolling mill drives and motors

The main drives for rolling mills are one of the most demanding applications for industrial drives. Fast and accurate control of torque and speed under all operating conditions is an important precondition for the successful control of material thickness, flatness and tension. For metals applications, ABB has developed dedicated special drive functions to achieve highest performance speed and torque control – enabling our customers to optimize production while ensuring quality, minimizing wear and enhancing reliability.

Power supply and distribution

Safe power supply demands individual solutions tailor-made to the specific plant. ABB offers: High-, medium- and low-voltage switchgear, motor control center, reactive power compensation, harmonic filtering, power supply and back-up installations, power and distribution transformers, cabling and protection.

Static var compensation

ABB static var compensation compensates for any random voltage variations and provides necessary voltage support, improved power factor and harmonic filtering.

Products and services – polished to perfection



Electromagnetic stirring for ladle furnaces at Pilsen Steel

Revamp of earlier EMS installations for 70- to 120-ton ladles after more than 20 years service at Pilsen Steel in the Czech Republic, helps Pilsen Steel to act as a globally competitive and reliable supplier of quality products – the result: 7% shorter mixing time after vacuum degassing of steel bath and up to 5 kWh/t electric energy saving.

Automation systems

ABB ranks as the world's largest provider of process automation systems. Our 800xA Extended Automation System is used by customers in all industries. System 800xA provides a common technology platform used by metals industries as a complete automation solution from melt shop to processing lines. The System 800xA product family can be scaled to meet different customer needs from PLC functionality up to high-end rolling mill controller including technological controls, mathematical models and simulation packages. With OperateIT, System 800xA provides state-of-the-art visualization and diagnostics for the complex requirements in metals applications. Real-time access to all plant data support for faster decision-making and operator action.

Warehouse logistics

ABB warehouse management is available to improve storage operations – with real-time stock information and handling of all components, from robots to cranes.

Optimization services and consulting

ABB's dedicated consultancy and upgrading solutions help improve efficiency and productivity to achieve the best possible ROI as well as to enhance the value of the production facility and processes. By carefully analyzing all operations, experts identify important links and open up new profitable improvement opportunities.

- Simulation, e.g., for mill processes or warehouse logistics
- Asset management
- Analysis of plant processes and expert advice
- Dynamic drive analysis
- Power network analysis, tailored to rolling mills and processing lines



ABB' s full service keeps production running seamlessly

ABB has been managing the maintenance for copper producer Boliden Harjavalta Oy, the nickel producing Norilsk Nickel Harjavalta Oy, and energy supplier Pori Energia Oy since 1999. The full service agreements place strong emphasis on the development of production efficiency. The three sites represent the biggest ABB Full Service entity in Finland, which are all located in the Harjavalta Industrial Park in western Finland, and employ nearly 200 people. ABB also handles maintenance operations for Boliden at its Pori plant.

Total life-cycle services

Trust ABB to support all the supplied equipment with qualified field service staff. We are structured in such a way as to ensure we maintain skilled resources for both process and equipment support.

- Field maintenance support
- Upgrades & evolution retrofits
- Operation & maintenance training
- Remote support services
- Parts and repair services

All life-cycle services are available on demand when needed or in multi-year service agreements. A customized range of services is available based on your operating needs.

ABB Full Service®

ABB' s Full Service® concept improves our customers' productivity with significant, measurable financial results. Our aim is to form globally coordinated long-term, performance-based agreements in which ABB commits to maintain and improve the production equipment performance and reliability for an entire facility.

- Improved plant and financial performance
- Increased reliability and life-time of process equipment
- Managing maintenance as a business
- Long-term partnership

Contact us

Metals System

Argentina

ABB S.A./Metals
Jose I. Rucci 1051
B1822CJU - Valentin Alsina
Buenos Aires, Argentina
Phone: +54 11 4229 5500
Fax: +54 11 4229 5850

Croatia

ABB Ltd./Metals
Bani 73a, Buzin
HR 10010
Zagreb, Croatia
Phone: +385 1 2580 000
Fax: +385 1 2580 555

India

ABB Ltd./Metals
KSIIDC Building, IT/BT Park
Rajajinagar Industrial Area
Rajajinagar, Bangalore- 560010
India
Phone: +91 80 2294 6111
Fax: +91 80 2314 8883

Sweden

ABB AB/Metals
Metallurgy Products
Terminalvägen 24
SE-721 59 Västerås
Sweden
Phone: +46 21 3400 00
Fax: +46 21 1483 27

Brazil

ABB Ltda./Metals
Avenida dos Autonomistas 1496
Osasco, Sao Paulo, Brazil
CEP 06020-902
Phone: +55 11 3688 9663
Fax: +55 11 3688 9079

Egypt

ABB Power System & Automation
Technology-S.A.E/Metals
7 Dr Mohamed Kamel Hussein Str,
El Nozha Elgedida-Heliopolis,
Cairo, Egypt
Phone: +20 2 2625 1709
Fax: +20 2 2622 2632

Japan

ABB K.K./Metals
Cerulean Tower, 26-1, Sakuragaoka-cho
Shibuya-ku, Tokyo 150-8512
Japan
Phone: +81 3 5784 6261
Fax: +81 3 5784 6276

USA

ABB Inc./Metals
16250 W. Glendale Drive
New Berlin, WI 53151
USA
Phone: +1 262 3542 551
Fax: +1 262 7850 417

China

ABB (China) Ltd./Metals
Universal Plaza, 10 Jiuxianqiao Lu,
Chaoyang District,
Beijing 100015, China
Phone: +86 10 8456 6688
Fax: +86 10 8456 7625

Germany

ABB Automation GmbH/Metals
Kallstadter Str. 1
68309 Mannheim
Germany
Phone: +49 621 381 7159
Fax: +49 621 381 8055

Russia

ABB Ltd./Metals
30/1, bld 2 Obrucheva St.
117997 Moscow
Russia
Phone: +7 495 9602 200
Fax: +7 495 9602 201

Metals Metallurgy Products

Sweden

ABB AB/Metals
Tvärleden 2
SE-721 59 Västerås
Sweden
Phone: +46 21 3400 00
Fax: +46 21 4125 95

Canada

ABB Inc./Metals
JME Division
90 Consumers Dr.
Whitby, Ontario L1N 7L5, Canada
Phone: +1 905 666 2251
Fax: +1 905 666 2266

Visit us at our website:

www.abb.com/metals