



ABB in metals

Helping our customers boost productivity
while conserving energy



- Working together with industry to provide a complete range of products, solutions and services that increase productivity, quality and cost-efficiency through the entire metals process.

With over a century in the metals industry ABB have the process knowledge and expertise necessary to help you overcome many of the challenges facing your business. Harnessing a global portfolio of technological innovations, we develop industry-specific products, solutions and services that maximize improvements in the productivity, quality and cost-efficiency of your operations from material yard to iron and steelmaking through casting, hot and cold rolling and processing lines. Working in close collaboration with our customers, our global network of experts and our local service organizations we deliver long-term performance optimization, and help you drive profitability for your business. Let's write the future.

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Efficient, productive and sustainable solutions through leading-edge technologies

Global competition, volatile raw material prices and demand for increased production flexibility are just some of the factors that motivate metals manufacturers to find new ways of reducing costs and optimizing operations. As a leading technology provider ABB can help you enhance performance, asset reliability and productivity while improving energy efficiency and safety.





Powering your operation to profitability

Your competitive edge depends on the optimal integration of electrical, automation and mechanical systems. The challenge of building new plants, revamping installed-base or expanding existing capacity requires world-leading competence. We provide you with customer-specific solutions and offer:

- Modernization of your existing plant
- Solutions to improve your operational reliability and to positively impact your economic performance
- Mathematical set-up models to help optimize productivity, quality and yield
- Solutions for asset optimization
- Lifecycle management of your production facilities
- Portfolio of world-class services to ensure maximum performance of your equipment



Improving environmental performance

With a commitment to environmental protection and sustainable development, the metals industry has a range of issues to address. We help you to improve environmental performance throughout the entire lifecycle of your production process by:

- Becoming a partner in your economic, environmental, social and educational development
- Delivering eco-friendly products that achieve reduced environmental impact over their complete life cycles
- Assuring that all our operations and processes comply with applicable environmental standards and legislation



Increased energy efficiency

Only by adopting new technologies and upgrading equipment can metals producers reduce energy consumption throughout the production process. We offer proven energy saving solutions with our comprehensive product range including:

- High-performance drives systems
- Advanced control and automation systems that optimize your process performance
- Market-leading metallurgical products that maximize the metal capacity with minimum investment



Your partner through every step of the process



Iron/steel making – solutions from material yard to continuous casting

To help achieve increased productivity and high product quality in steel and iron making, ABB has developed a range of metallurgical products and fully integrated technological solutions that facilitate flexible operation, total process supervision, comprehensive reporting as well as operator guidance.

Our offerings are for:

- Raw material yards
- Coke ovens
- Sinter plants
- Pellet plants
- Blast furnace
- Direct reduced iron plants
- Basic oxygen furnace
- Electric arc furnace
- Ladle furnace
- Continuous casters (slab/bloom/billet)

ABB's automation technology for iron and steel making also includes process control, instrumentation, MV/LV drives, MV/ LV switchgear, Motor Control Centers, motors, analyzers, stockyard management and cranes solutions, process optimization as well as asset management solutions.



Hot rolling – solutions from hot flat to profile and tube mills

Since 1894, the number of ABB innovative solutions and 'world firsts' have made us an attractive supplier for rolling mills. ABB is a leading long-term supplier for all types 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.

Our offerings are for:

- Plate mills
- Steckel mills
- Hot strip mills
- Section mills
- Rod & bar mills
- Rail mills
- Bloom & billet mills
- Seamless tubes mills
- Welded pipes

In-depth knowledge of technological functions, process models, advanced process control and diagnostics allows ABB to guarantee high quality performance in terms of thickness, width, flatness and temperature at the highest level of productivity.



Cold rolling – solutions for carbon steel, stainless steel and non-ferrous metals

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 precisely monitored and controlled in order to produce a perfect product. The exact match of ABB's products and solutions allows you to achieve extraordinarily high quality, productivity and yield.

Our offerings are for:

- Single stand mills (non-reversing mills, reversing mills, inline mills)
- Tandem cold rolling mills (batch, compact cold mills, continuous/inline mills)
- Skin pass/temper mills
- Double cold reduction mills
- Foil mills

With Roll@xA, ABB offers a solution package to optimize and control rolling mill processes. It covers a range of features from auto-adaptive set-up models, advanced technological control, and simulation solutions through to the efficient visualization of the entire process, including operation and diagnosis concepts that together help guarantee maximum productivity, quality and yield.



Processing lines – solutions for carbon steel, stainless steel and non-ferrous metals

Based on extensive industry experience our solutions for all types of processing lines are designed to manage high numbers of line drives, accurately control the critical functions of tension and speed and maximize plant productivity.

Our offerings are for:

- Continuous annealing and pickling lines
- Bright annealing lines
- Pickling lines (push-pull, continuous)
- Continuous galvanizing lines (with or without pickling)
- Electrolytic lines
- Coating lines
- Tension leveler lines
- Others (tinning lines, cleaning lines, cut-to-length lines, slitting lines, coil preparation lines, etc.)

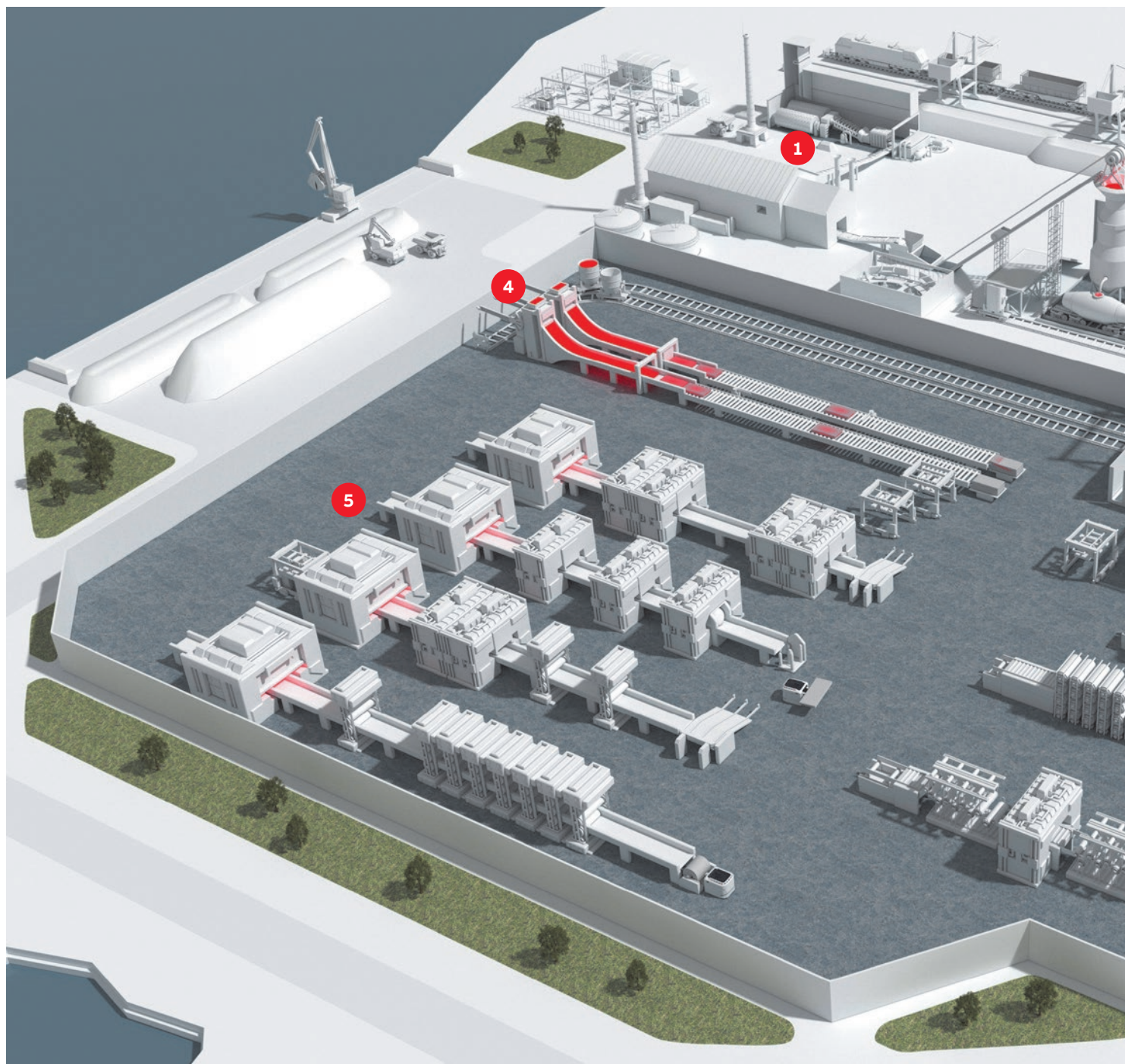
With its proven control solution package, ABB has successfully managed some of the world's most complex processing lines including the largest cold annealing and pickling line, the largest bright annealing line, the fastest continuous annealing line and the thinnest stainless steel bright annealing line, providing high reliability, stability and accuracy.

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Taiyuan Iron and Steel
Corporation, China
World's largest bright
annealing line



From yard to market

A complete portfolio of solutions



Electromagnetic
stirring and
braking devices



Measurement
and analytics



Fully integrated
power systems



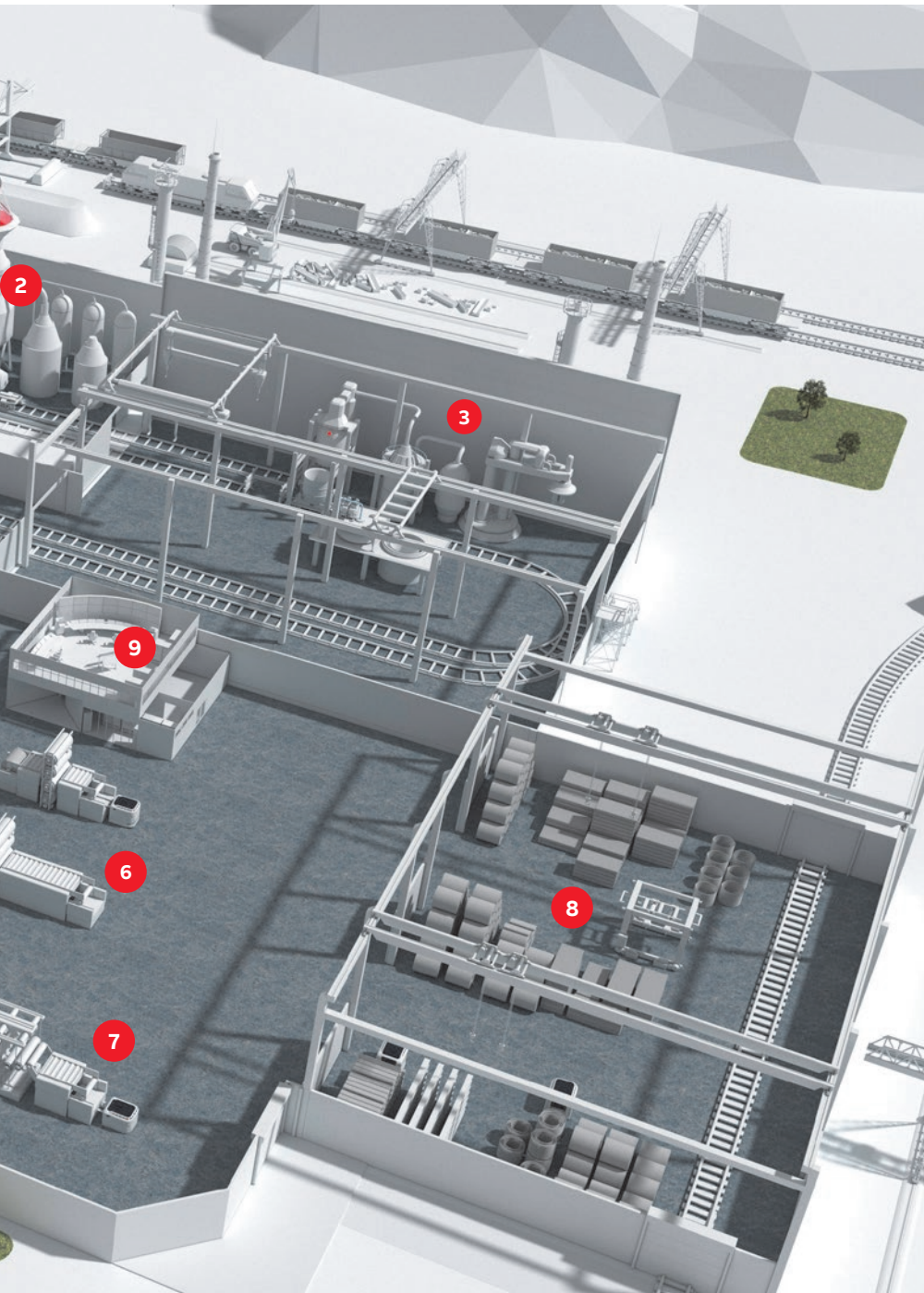
Automation and
control solutions



Collaborative
Production
Management



Process
analysis



- 1 Material handling
- 2 Iron making
- 3 Steel making
- 4 Continuous casting
- 5 Hot rolling mills
- 6 Cold rolling mills
- 7 Processing lines
- 8 Stockyard
- 9 Plant operations



Handling
cranes



Installation and
commissioning



Lifecycle
services



Remote support
services

Integrated solutions for the complete value-added chain

ABB's superior products, solutions and services ensure the highest possible return over the entire life of your plant. Our portfolio and expertise cover the full value-added chain. We excel at integrating equipment, skills and services into a comprehensive customized solution that strengthens your entire operation.

Control and automation systems – full integration of process, electrical and safety

There is more pressure than ever to run your operation profitably – to achieve greater results with fewer resources. ABB is the world's largest provider of process automation systems. ABB Ability™ System 800xA extends the reach of traditional automation – beyond control of the process – to increase energy efficiency, asset utilization, energy savings and operator effectiveness.

The ABB Ability™ System 800xA product family is fully scalable to customer needs from PLC functionality to high-end rolling mill controller, including technological controls and simulation packages.

It also provides state-of-the-art visualization, operation and diagnostics for the complex requirements of metals applications, from a common technology platform with unparalleled connectivity to enterprise and plant systems, applications, and devices.

Real-time access to all plant data improves operations, engineering, control and maintenance and provides a collaborative environment to support faster decision-making.

Collaborative production management – an integrated solution for production management

CPM4Metals is a family of solutions from ABB designed to enable metals manufacturers to utilize process monitoring, analysis and mathematical models to improve optimization for all steel production processes as well as hot and cold rolling, finishing and treatment in processing lines and will help you achieve:

- Quick and easy access to online production reports and data feedback gives greater operational visibility and provides opportunities for improving plant utilization.
- Line stop/downtime monitoring and analysis details the what, when and why of issues standing in the way of higher productivity.
- Equipment monitoring including operating time, cycles and roll wear provides for improved maintenance and planning.
- Quality management including inspection, material rejection, monitoring and gap analysis support quick and correct decision-making to ensure maximum productivity and quality.
- Calculation of pass schedules and set-up values based on mathematical models allow for optimized equipment and processes resulting in less scrapping, more uniform quality and savings in energy and operational efficiency.

ABB's CPM4Metals ensures an evolutionary approach to your future business needs, including manufacturing flexibility, transparency of operations, production visibility, improved cycle time, product quality and reliability.



Motors and drives – leading-edge technology for metals applications

Metals processes demand large amounts of energy, high dynamics, precision and overload capabilities to reliably keep production moving accurately and efficiently. Safety and easy maintenance of the equipment are also essential to ensuring maximum productivity. Our drives portfolio can offer you solutions that meet these requirements. ABB's range of variable speed drives, from small low-voltage drives to multi-megawatt medium-voltage drives, cover the entire metals process.

We offer you:

- State-of-the-art AC and DC drive solutions
- Drives with Direct Torque Control (DTC) for fast and precise speed and torque control
- Multi-drives for multi-motor control via shared DC bus
- Capture and reuse motor braking energy
- Easy integration into automation control networks

Electrification and composite plant solutions – recognized power technologies

Energy efficiency begins with well-designed power distribution. ABB's electrification technologies are present throughout the metals industry value chain. We offer solutions in the areas of electrical power distribution, process electrification, power management systems, plant engineering services and site management from erection to commissioning services.

Measurement and analytics – experience and know-how

In the demanding environments of the metals manufacturing getting the right balance between accuracy, speed and reliability in your sensing systems is critical. ABB offers a wide range of dedicated products including:

- Weighing systems
- Roll force measurement products
- Strip tension measurement
- Flatness measurement & control
- Strip width & positioning measurements
- Strip thickness gauging

Industrial cranes – robust and reliable

Crane systems are an important component in metals process chain. ABB's long-term experience has enabled us to develop crane systems that are designed to perform reliably under these conditions without a loss of accuracy. We offer advanced power and control solutions for cranes and platforms in all environments including:

- Grab unloader, scrap handling cranes and magnet cranes for handling bulk material
- Charging and ladle handling cranes for continuous casting and furnaces
- Slab and billet, coil and plate handling cranes
- Lifting process cranes for stacker reclaimer, steel conveyer and take over trucks

Productivity, product quality and optimized costs with ABB dedicated products in metals

Advanced technologies that improve quality and productivity and reduce overall costs are crucial as demand for high-performance metals continues to grow.

ABB's complete metallurgy product range, developed in close collaboration with steel and aluminum producers, combined with unrivalled experience and expertise, make us the ideal partner for electromagnetic stirring solutions.

Electromagnetic stirrers and brakes for steel – the latest stirring technologies

In metallurgical processing, the technology for stirring and braking the melt is fundamental to obtaining the highest quality and productivity. ABB offers the world's most comprehensive range of electro-magnetic stirrers (EMS) and brakes for electric arc and ladle furnaces, as well as continuous casting machines. They include:

- **Electromagnetic stirrers for electric arc furnace**

ArcSave® is the latest generation of electro-magnetic stirrer. More powerful stirring, customized to your process needs, results in a whole range of improvements that optimize metallurgical performance and contribute to savings in time, materials and other operational costs.

- **Electromagnetic stirrers for billet and bloom casters**

A wide range of stirrers to improve product quality, reproducibility, yield and production flexibility.

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ArcSave® gives up to 5% energy savings, up to 1% increased yield and up to 6% increased productivity





For thick and thin slab casters, ABB's product portfolio includes stirring and braking devices for all casting speeds:

- **Electromagnetic brake (EMBR)** is a unique electromagnetic braking system designed for thin slab casters, and a prerequisite when casting thin slabs with high throughput or for the higher quality segment.
- **FC Mold** is the most modern electromagnetic stirring and braking device available for thick slab casters. Applying AC and DC technologies simultaneously creates a stable and desirable flow in the mold, improving surface and internal quality in the cast slab and allowing for higher throughput.
- **Optimold Monitor** is the latest development in mold temperature measurement. With over 4000 fiber-optic sensor points per complete mold, spatial resolution is more than 20 times greater than conventional temperature measurement systems. Sensor data is analyzed and can, together with Optimold Control, be used to optimize performance of electromagnetic stirring/braking devices and achieve real-time, online process control.

Electromagnetic (EM) Stabilizers for galvanizing lines

Due to the complex oscillation behavior and self-resonance of a metal strip, designing a system to dampen vibration and control the shape of the metal strip can be a real challenge. ABB's EM Stabilizer offers a unique control concept, reducing vibrations and strip shape problems such as cross bow in galvanizing lines, thus helping the steel industry to improve quality and lower costs.

Electromagnetic stirrers for aluminum furnaces (AI-EMS)

ABB's AI-EMS are designed for high-performance, flexibility and reliability and provide significant improvements in the aluminum melting process, including reduced dross formation, increased heat transfer and alloy dissolution rates. Resulting metallurgical benefits include reduced cycle times, increased yield and rapid chemical and temperature homogeneity. In short this means improved quality and productivity, reduced energy consumption, and a reproducible product quality that helps to simplify your operation.

A complete portfolio for all your service needs

Lifecycle services for the metals industry

With over 100 years in the metals industry, ABB understands the challenges you face and offers a range of services to optimize your processes, protect your equipment and ensure maximum productivity. ABB delivers services tailored to meet your specific requirements, from long-term service agreements, individual service products, and state-of-the art technologies, all designed to ensure your plant operates at peak performance and cost efficiency.

Our service portfolio is designed to optimize your assets, increase the availability and reliability of your equipment, and deliver cost savings.

It includes:

- Service agreements
- Advanced services
- Spares and consumables
- Repairs
- Maintenance
- Training
- Engineering and consulting
- Extensions, upgrades and retrofits

Metals Industry Care

Metals Industry Care is a long-term, performance-based agreement where ABB commits to maintaining your equipment and improving overall mill performance. A Care package can be customized to keep production running, maximize system lifecycle and increase throughput and yield.

Advanced optimization services for your mill

Based on a deep understanding of the equipment and processes at your mill, ABB has developed specific advanced optimization service solutions to minimize downtime, reduce energy and raw material consumption, and give you complete control of your systems and equipment. These services focus on identifying the sources of inefficiencies that are preventing peak performance and delivering solutions that provide the greatest economic return.

- **Drive Dynamics Analysis (DDA)**, a service based on a software package developed by ABB, ensures better mechanical and electrical performance for your drives. We identify the causes of poor dynamic performance in drive trains and determine the correct parameters for optimizing the system, improving productivity and product quality.

- **Bar and rod mill ProfileOpt** is a state-of-the-art physics-based model for profile rolling that provides a detailed assessment of the bar and rod mill to maximize set-up values. ProfileOpt can help you reduce rolling power by 4–10% and increase productivity by 8–10%, depending on operational constraints.
- **Mill fingerprint** services are complete lifecycle audits for profile or cold rolling mills, providing a customized evaluation of mill processes and related components. ABB delivers a detailed improvement plan that is prioritized, based on estimated economic benefits, providing a clear path to quickly resolve issues with productivity, quality and yield gaps.





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