



METALS

# Roll@xA – modular intelligence

The innovative solution package for maximum productivity and quality in rolling mills



- Optimization of the strip quality and throughput
- Reduction of bottlenecks and flaws



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**Optimized processes through innovative solutions.**

**When your production is faster, better and more cost-effective, then you are a main step ahead in worldwide competition.**

**That's because productivity, quality and efficiency are the essential factors for being successful today. And tomorrow.**





Increased productivity in rolling mills translates into increased throughput – thanks to increased speed, decreased non-rolling time and fewer threading problems.

Maximum quality means flawless strips in terms of strip surface, flatness, strip thickness, off-gauge length and therefore the most effective use of material. The quality of strip products is significantly determined by the technology being applied.

With Roll@xA, ABB offers you an innovative solution package to optimize the sophisticated and complex processes of rolling. With four harmonized components you have the perfect technical solution that you need for the various rolling processes. It is backed up by our experience from more than 800 cold rolling mills worldwide.

The expertise of ABB in the field of metal processing comprises a complete and innovative product and solution portfolio:

- Production planning system with pass scheduling and setup calculation
- ABB Ability™ System 800xA automation
- Drive systems for low and medium voltage
- Measuring systems and instrumentation
- Consulting and services

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Discover the next generation of automation in rolling mills with Roll@xA. So you can make your production even faster, better and more cost-effective.







# Roll@xA – innovative solution package

Model-based pass scheduling and setup calculation

## Make the right pass

Our solutions for pass schedule planning and setup calculations are practice-tested. Thus, based upon specified coil data such as alloy, strip width, entry and exit thickness, the reduction is distributed optimally over several passes.

The setup calculation determines all rolling mill preset values, for example for roll force, position and flatness. The adaptive mathematical model calculates and continuously improves these preset values.

- Generation of pass schedules
- Calculation of the plant preset values (speed, tension, roll force, position, bending, crown, etc.)
- Reduction of the off gauge lengths
- Optimization of the strip quality and throughput
- Minimization of non-rolling time

Innovative technological controls

## Precise is not good enough

The package stands for optimal control concepts for strip thickness, flatness and strip tension. The latest development for strip thickness control uses a model-based, dynamically decoupled multi-variable controller. Thus it takes into account the strong couplings between thickness, strip tension and roll gap position and, using an integrated model, it performs an online estimation of the time-variant process parameters. A dynamic feed forward control strategy helps to suppress disturbances.

The result: Robust control that produces vastly improved strip thickness quality for different materials and all operating points.

- Scalable controls dependent upon the sensor and actor concepts
- Smaller thickness and flatness tolerances across the entire strip length
- Reduced off gauge lengths
- Optimized throughput by means of uninterrupted mill acceleration and increased operating speed





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## For optimizing your rolling processes

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### Quality analyses, online and offline

#### **Continuously improving**

Quality analyses are designed to help you monitor that your products are fulfilling the high demands for tolerances in thickness, flatness and surface quality at all times. They perform comprehensive checks and analysis of the rolled material using defined criteria, both online and offline. This way, quality deviations and their causes can be detected and eliminated as fast as possible.

In the offline version measured data is read in from different file formats for analysis. The causes of deviations in quality are determined and clearly displayed in graphic form.

In the online version, the results of the analysis are presented in real time and remain available as characteristic values for further evaluations.

- Monitoring and supervision of various parameters of the incoming strip
- Analysis of periodically occurring deviations in output strip thickness
- Quality deviations and their causes can immediately be detected online
- Decision support for optimization and for elimination of detected causes

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### Consultation, analysis and simulation

#### **In word and deed**

The complex rolling process is influenced by a number of factors – from mechanical and electrical equipment and the material to be processed all the way to accompanying process parameters such as roll pressure, lubrication and the applied control technology. That's why we take during analysis the whole rolling process into account. Through simulation and analysis of the drive system, wear and tear, strip breakage and thus the resulting down-time can be minimized.

An energy network analysis examines the entire power supply and identifies ways to remove weak points. A process analysis of the entire control and drive system provides an analysis and optimization of the strip quality, performance and throughput.

- Analysis and simulation for all rolling mills
- Visualization of the causes for quality problems
- Reduction of bottlenecks and flaws
- Identification of primary optimization factors
- Decision help for improving performance and capacity
- Comparison of potential solutions to identify the best concept



# Put us to the test

We deliver you a clear performance promise: Better productivity and better quality. And we allow ourselves to be measured by it too. The innovative solutions of Roll@xA are already being applied – and they have proven themselves in practice. Are your plants prepared for the challenges of tomorrow? Don't wait. Apply our know-how. Go ahead and contact us!

## **ABB offers you expertise for the entire life cycle of your plant**

Our specialists have comprehensive know-how and experience:

- Process technology and metallurgy
- Technological know-how in process and control technology
- Extensive mathematical-physical know-how
- Project-specific design of technological platforms and solutions

## **Apply our know-how to your rolling processes**

As the market leader in the fields of automation and drives, we have equipped numerous plants with technology "Made by ABB". Experience shows that ABB solutions have proven themselves world-wide. They can be applied for all the various rolling applications: The rolling of steel, stainless steel or non-ferrous metals. In discussion with our customers, we always have the goal to continuously improve and to find the right solution together. This is what our staff stands for – along with the right passion for your products and processes.

### **Example: Continuous 5-stand 6-high steel tandem cold mill**

New plant with drives, process automation and manufacturing execution systems, preset models for set-up calculation, technological controls and quality analysis. Plant simulations (hardware-in-the-loop) minimized start-up time. The result: Excellent strip quality and high throughput.

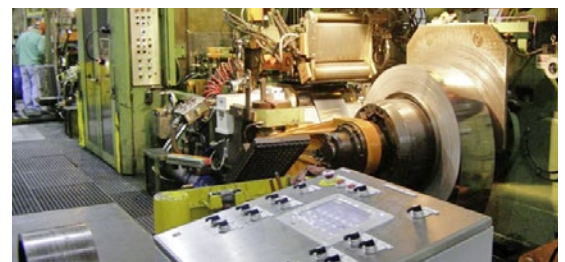


### **Example: 3-stand 6-high aluminium tandem cold mill**

New plant drives, process automation and manufacturing execution system, preset models for set-up calculation, technological controls, quality analysis and plant simulations. The result: Excellent strip quality and high throughput.

### **Example: High precision x-high finishing reversible copper foil mill**

New plant with drive systems and process automation, manufacturing execution system, technological controls and implementation of quality analysis. The result: Excellent strip quality down to thickness of 6µm and high throughput from start-up and onward.



### **Example: 20-high special steel cold reversing mill**

Modernization of drive system and process automation, manufacturing execution system, preset models and technological controls. The result: Minimum off gauge lengths, improved strip quality and increased throughput.



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