Mechatronic solutions for the steel industry

Intelligent products for high performance and precision
Product and process precision: A new level in plant optimization

Your challenge:

Steel companies are faced with steadily rising demands on quality, safety and efficiency but in many instances the manpower or outdated equipment is simply insufficient.

Thanks to the enormous and rapidly ongoing progress in the performance of modern computers, software and electronics, completely new options and potentials are now available through mechatronic solutions. The optimized interaction between mechanics and automation results in remarkable process improvements and can help plant operators achieve conflicting goals: Improve process quality whilst remaining competitive under rising cost pressure. Increase the plant’s productivity whilst keeping energy consumption and the environmental impact low. Serve today’s fastest growing industries whilst being prepared for the challenges of tomorrow’s steel market. 

This remarkable ability makes mechatronic solutions of key importance for future competitiveness in the steel industry. Are you prepared for a new level in performance?

Our solution:

The mechatronic solutions of Siemens Metals Technologies are the result of our vast experience in designing mechatronic systems and measurement and control devices for the steel industry. These solutions enable completely new system and process functionalities through the intelligent interaction of mechanical, electronic, hydraulic and software systems.

Based on protected know-how, experience in mechatronics and its individual disciplines and in steel plant engineering, we have developed modular mechatronic packages which are perfectly customized to meet specific market requirements and ensure a faster return of investment.

Our mechatronic portfolio comprises measurement systems, technology packages, plant condition monitoring systems, robotics and metals production simulators which can all be easily integrated into existing or new plants.

As a full-service partner throughout the entire metal production value chain, we help our customers to constantly improve – by providing them with innovative services for the upgrading and adjusting of existing production lines that results in measurable benefits.

Efficiency, reliability and safety: Be prepared for the steadily rising market demands – with mechatronic solutions of Siemens Metals Technologies.

Best product quality through mechatronic equipment
The mechatronic solutions of Siemens Metals Technologies are the next step in the evolution of intelligent systems for the iron and steel industry. The advanced technology packages open up new possibilities for the optimization of the information and process flow. Experience product and process precision at a new level. Take the next step towards ultimate efficiency.

Advantages of mechatronic solutions of Siemens Metals Technologies:

- **Increased efficiency** – thanks to reduced energy consumption and lower production costs
- **Higher plant reliability** – through intelligent production control and additional support for preventive maintenance
- **Improved quality** – due to advanced monitoring, measurement and control
- **Improved safety** – thanks to a high degree of automation with advanced software solutions
- **Fast return of investment** – through innovative modular mechatronic packages
- **Complete solutions from a single source** – for both new and existing plants over the entire processing chain, including upgrades and mechatronic services
Steelmaking

The rough, hot and dust-laden conditions of steelmaking plants together with high amounts of required energy and materials offer an enormous cost-saving potential when exact process information is available and plant operation has been optimized.

SIMETAL Arcos
- Intelligent electrode regulation systems for AC furnaces
  - Optimized melting performance
  - Lower consumption of energy, electrodes and refractory
  - More than 220 installations worldwide

Dynarcos
- Optimization system for sophisticated meltdown process and thermal balancing
  - Automated meltdown control
  - Thermal furnace balancing
  - Reduction of downtime and conversion costs

Optical foaming slag manager
- Foaming slag control for optimized slag levels
  - Reduction of carbon consumption
  - Increased metal yield
  - Reduced refractory consumption

SIMETAL Lomas
- Gas analysis for hot, corrosive and heavily dust-laden gases
  - High availability, short response time
  - Reduced conversion costs
  - More than 150 installations worldwide

SIMETAL SlagMon
- Infrared slag detection system for tapping optimization
  - Reduction of slag carryover
  - Reduction of conversion costs
  - Reliable, maintenance-free solution

SIMETAL LiquiRob for EAF or BOF
- Robotic measuring and sampling system
  - Significant increase of health and safety conditions
  - Higher reproducibility and shorter process cycles
  - Potential cartridge cost reductions (various cartridge types e.g. T, S, celox)

SIMETAL Lomas probe
Continuous casting

Only intelligent control of the mechanical plant components and accurate adjustment of the continuous casting plant enable the production of perfect and cost-optimized input material for the rolling process.

** SIMETAL Mold Expert **
- Mold monitoring – breakout prevention and detailed thermal mold level and oscillation analysis
  - World-leading system for the prevention of downtimes
  - Improved product quality through better understanding of the solidification process

** Thermocouple Checker **
- Full function check prior to mold operation
  - Minimization of downtimes
  - Supports your quality management

** SIMETAL Mold SurfaceMon **
- Temperature monitoring of casting powder surface
  - Improved quality through the reduction of inclusions
  - Can be combined with an automatic powder feeder

** SIMETAL Gap Checker **
- Manual measurement of roll gap
  - Compact design with highest accuracy and reliability

** SIMETAL Mold Checker **
- Complete 3D measurement of slab, billet and bloom
  - All-in-one device for mold adjustment
  - Reduced costs through increased mold lifetime
  - High product quality is ensured by monitoring mold wear

** SIMETAL OsciChecker **
- Portable diagnosis of oscillator movement
  - Prevention of shutdowns
  - Guaranteed condition-oriented maintenance

** SIMETAL OsciMon **
- Online monitoring and diagnosis for oscillator movement
  - Reduced loss of productivity through online recognition of oscillator malfunctions
  - Enhanced casting process stability

** SIMETAL LIquirob for CC **
- Robotic automation for the casting floor
  - Significant improvement of health and safety conditions
  - Optimum stability and reproducibility through robotic operation
  - The perfect upgrade solution for continuous casters

** SIMETAL Strand Checker **
- Measurement of roll gap, rotation, alignment and spray water
  - Optimum use and maximum life-cycle of CC line
  - Accurately adjusted strand leads to better quality
  - Shortened maintenance times

** SIMETAL Mold Expert **
- Mold monitoring – breakout prevention and detailed thermal mold level and oscillation analysis
  - World-leading system for the prevention of downtimes
  - Improved product quality through better understanding of the solidification process

** SIMETAL OsciChecker **
- Portable diagnosis of oscillator movement
  - Prevention of shutdowns
  - Guaranteed condition-oriented maintenance

** SIMETAL LIquirob for CC **
- Robotic automation for the casting floor
  - Significant improvement of health and safety conditions
  - Optimum stability and reproducibility through robotic operation
  - The perfect upgrade solution for continuous casters

** Robotics **
Rolling, processing, finishing

Knowledge of material properties and plant conditions is essential for handling high-grade and cost-intensive material and for ensuring the reproducibility of process parameters for continuously high quality levels.

**SIROLL PropertyMon**

*Inline measurement of mechanical properties*
- 100 % quality control of the whole steel strip
- Reduction of customer complaints
- Process optimization with respect to capacity, energy and throughput

**SIROLL ChatterMon**

*Prevention of strip breakage and chatter detection*
- Prevention of breakage caused by third octave chatter
- Detection of fifth octave chatter
- Detection of roll defects (work and backup rolls separately)
- Long-term data storage for additional offline analysis

**SIROLL EdgeMon**

*Edge inspection and evaluation of shear knife quality*
- Quality improvement for the side trimming process
- Prevention of claims resulting from knife breakouts
- Optimization of shear knife lifetime and minimized set-up times
- Inspection of trimmed and non-trimmed strip edges

**SIROLL ShapeMon**

*Shape measurement for heavy plates and hot strip*
- Optimization of quality and output
- Minimization of crop losses
- Automatic cutting plan generation
- Complete documentation of geometrical parameters of the rolling process

**SIMETAL DMon**

*Preventive maintenance for drive trains*
- Automatic, adjustable signal analysis
- Long-term trending for every single part
- Automatic e-mail alarm features
- Easy-to-use web interface

**SIROLL PropertyMon sensor with protective cover**
Process simulation

Progressive R&D focuses on innovative products, short time to market, cost-saving material development in the laboratory, avoidance of plant shutdowns and definition of varying process conditions.

SIROLL Simulator for annealing line
Multi-purpose annealing simulator
- Highest flexibility concerning heating and cooling
- Water quenching to “freeze” the inner material structure
- Large variety of sample size
- Highest sample throughput with easy handling

SIROLL Simulator for galvanizing line
Hot dip galvanizing simulator
- Accurate simulation of hot dip galvanizing process
- Different heating mechanisms
- Adjustable inert gas atmospheres
- Simulation of innovative zinc-based coating types

SIROLL Simulator for cold mill
High-performance laboratory for cold rolling and skin pass mill
- Fully automatic operation
- Precise control of rolling and skin pass processes
- Accurate control of strip tension
- High sample throughput
- Controlled rolling of small samples possible

SIROLL Simulator for hot mill
High-performance laboratory for hot rolling mill
- Material and process development without interference at the production plant
- Fully automatic operation
- Accurate control of hot rolling process
- Controlled hot rolling of small samples possible
The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

All rights reserved. Subject to change without prior notice.
SIROLL and SIMETAL are trademarks of Siemens AG.