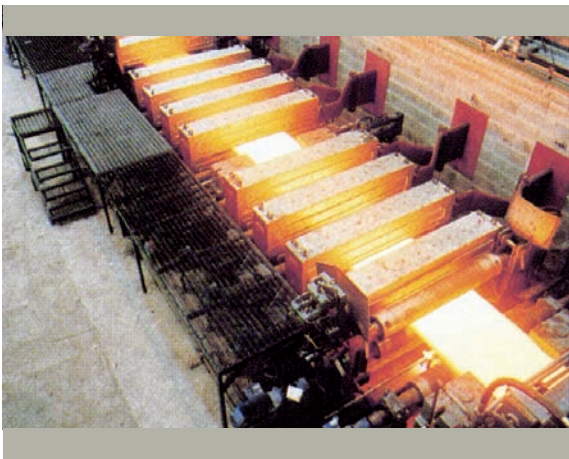


Drive and Automation Solutions for Mini Mills

Converteam is a world leading company in providing solutions for hot flat-product mill control, with around 300 successfully commissioned hot strip, mini mills and plate mills.

Converteam has worked with most international mill-builders, forming close technical partnerships, becoming familiar with the mechanical design adopted by each and how to control it to best effect.

We have provided solutions which complement the very latest technology in mechanical and hydraulic engineering and instrumentation disciplines.



Applications

Our references include hot strip mills of all types:

- Semi-continuous strip mills
- Continuous strip mills
- Thin slab casting
- Steckel mills

The new way...

Mini Mills bring saving, both in capital investment and running costs, together with high product quality, combining the advantages of the electric arc furnace for scrap-melting with near-net-shape casting and subsequent direct-charge rolling.

Converteam pioneered the drives and automation systems for some of the first production plants for Mini Mill "CSP" and "ISP" technologies; and this experience provides a basis for us to move forward, with these and other exciting new technologies - such as Conroll, fTSR, TSP and direct strip casting.

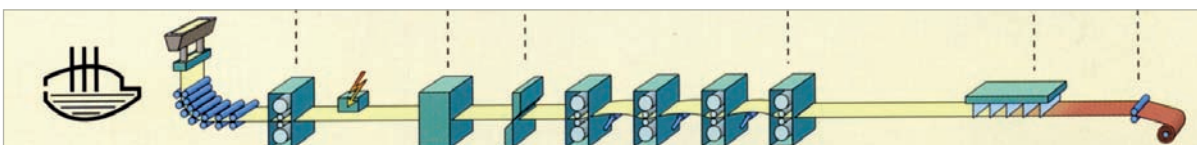
Typical scope of supply

- Power distribution system
- Drive systems
- Process control system
- Level 1 and level 2 automation systems
- Operator and maintenance aids
- Utilities (ventilation, CCTV, fire protection, lighting...)
- Erection, cabling and commissioning on site
- Training

Benefits for our customers

Based on high-performance power electronics and automation, Converteam solutions perfectly fit our Mini Mills customers' needs for smaller and more profitable production units with short production routes.

- Greater efficiency
- Higher availability
- Higher throughput
- Better quality
- Improved yield
- More market share



Drive and Automation Solutions for Mini Mills

Harmonized power and drives solutions

Converteam solutions cover every aspect of power technology as well as future-oriented automation.

- AC drives of all types, for both main and auxiliary applications
- Cost-effective drive systems for main drives with induction or synchronous motors, fed via high performance frequency converters
- Special drive control for low-speed, soft reduction mills, hot coil-stations/boxes, fast-acting shears and loopers, downcoilers with "jump" control, etc. -all equipped with built-in diagnostics
- Complete tailor-made systems with all sensors, actuators, monitoring and diagnostic tools for precise control, easy maintenance, high availability... and maximum benefit.

Powerful models and control strategies

- Process model library to describe the process physics; typical models: cooling patterns for thin-slab caster, roll stack deflection, heat transfer
- Optimizing calculations to produce the on-line rolling strategy
- Process simulation models to predict process performance, to support design and validate control strategies
- Real-time simulation to validate the final control system

Converteam expertise:

Process management

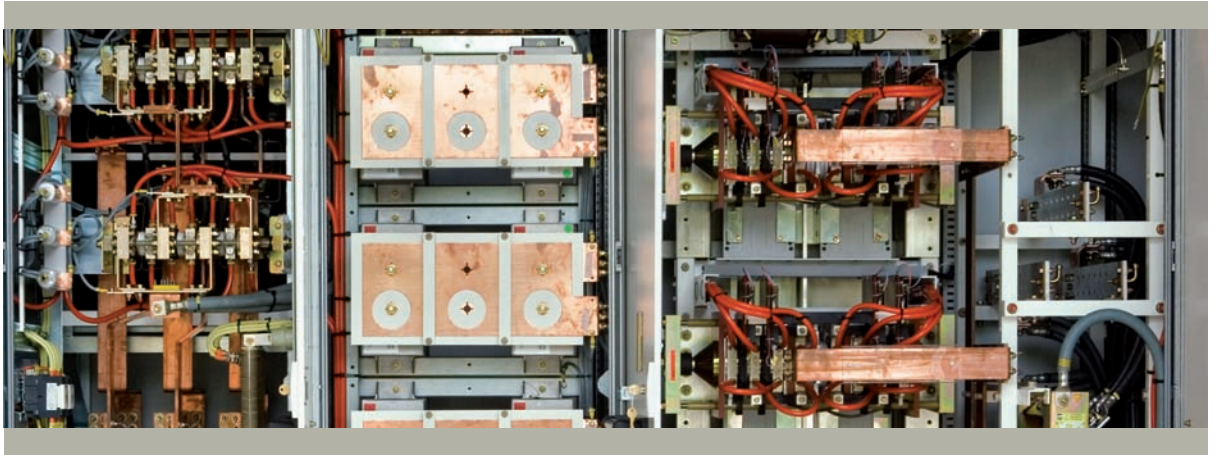
- Mill scheduling/loading (prime data acquisition, etc)
- Integrated mill/caster pacing
- Product tracking
- Operational/maintenance reporting...

Process control

- Set-up for crown/flatness (roll profile calculation, stack deflection model, actuator optimization)
- On-line model-building (from logged/analyzed data)
- Integrated dynamic control (AGC, looper controller, feed forward flatness control)...

Process support

- Automatic roll change sequence
- Simulation tests/dummy bar
- Maintenance monitoring
- Fluid systems...



Converteam solutions are based on key concepts:

- Managed structure
- Re-usability
- Consistent model
- Modular economy
- Off-line support