gontrol steelmaking

Level 2 process automation software





smarter steel production, greater efficiency

Steel production thrives on precision and optimization. **qontrol steelmaking** provides realtime intelligence, automation, and full production tracking—enhancing productivity, reducing costs, and ensuring quality while effectively integrating with your systems.

CORE CAPABILITIES

- Intelligent Process Control & Optimization
 Digital twins, automated setpoints, and raw material optimization improve efficiency
 and yield.
- Full Melt Shop Integration & Tracking End-to-end heat tracking, material genealogy, and automated quality validation ensure process reliability.
- Cross-Process Data Management & Reporting Real-time dashboards, production reports, and Factory Radar provide live operational insights.
- Modular & Scalable Architecture

Modular architecture supports individual units or full-scale steelmaking with seamless system connectivity.

Redefine efficiency, quality, and sustainability in steel production with **qontrol steelmaking**.

System Highlights

Cost & Energy Optimization

- Advanced charge and heat optimization for raw material cost reduction.
- Automated energy management for lower power consumption and CO₂ footprint reduction.
- Minimized alloying material usage and costs without compromising quality.

Full Traceability & Compliance

- End-to-end process monitoring, ensuring regulatory compliance and product quality assurance.
- Automated process validation to maintain consistency across all metallurgical operations.

Seamless System Integration

- Works with existing automation infrastructure, reducing implementation time and costs.
- Interconnectivity with ERP, MES, LIMS and Level 1 automation systems.
- Supports OPC UA, TCP/IP, MQTT, industrial database protocols and many other communications patterns.

Scalable & Modular Deployment

- Implement for a single unit (e.g., EAF, LF, CC) or integrate across the entire steelmaking process.
- Flexible cloud-based and on-premise deployment options.



Set the standard, stay in control, and optimize with intelligence—powered by **qontrol steelmaking**.

Application Areas





Scrap Yard | SY

RAW MATERIAL OPTIMIZATION

- Al-driven scrap characterization
 for real-time yield, composition, and energy efficiency.
- qontrol maps for intelligent cost optimization and raw material input management.
- Automated bucket tracking with qurve camera sensors.

Electric Arc Furnace | EAF

OPTIMIZED MELTING PROCESS

- Scrap yard integration ensures material tracking, mix accuracy, and yield.
- Carbon and oxygen control optimize decarburization, dephosphorization, and slag stability.
- Automated slag management maintains basicity and efficiency.
- Optimized energy use reduces costs across electrodes, burners, and chemical reactions.

Ladle Furnace | LF

TEMPERATURE CONTROL & EFFICIENT STEEL REFINING

- Temperature control optimizes heating, transformer settings, and transfer temperature.
- Automated alloying and deoxidation ensure target composition.
- Slag control maintains basicity and enhances desulfurization.
 - Stirring gas control homogenizes temperature and removes inclusions.



Vacuum Degassing | VD/RH

HYDROGEN & NITROGEN REMOVAL

- Optimized degassing ensures hydrogen and nitrogen removal, considering vacuum time and heat loss.
- Temperature control predicts losses using real-time data and modeling.
- Stirring gas control balances intensity, consumption, and temperature for homogenization.
- Automated alloying and deoxidation maintain target composition and steel quality.

GUIDANCE



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Clear management of orders, materials, and advanced analytics provide strategic direction for efficiency.

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SUPERVISION



Real-time tracking and detailed reports ensure full oversight of materials, products, and equipment.

Covering the Entire Steelmaking Process



Vacuum Oxygen Decarburization | VOD

STAINLESS STEEL OPTIMIZATION

- Real-time carbon predictions optimize ٠ decarburization and oxygen blowing to reduce chromium oxidation.
- Blowing strategy minimizes chromium loss. . lowering reducing agent costs.
- Automated alloving and reduction control . ensure precise material additions.
- Degassing models optimize nitrogen purging for controlled alloving.
- Temperature control accounts for vacuum and reaction-related heat losses.

Argon Oxygen Decarburization | AOD

STAINLESS STEEL OPTIMIZATION

- Real-time carbon predictions adjust oxygen . and gas flow for precise decarburization.
- Optimized oxygen/gas ratio minimizes . chromium oxidation
- Nitrogen-argon switchover ensures target . nitrogen levels while reducing gas costs.
- Automated alloving control prevents . overheating by leveraging cooling effects.
- Reduction calculations recover oxidized . chromium for higher yield.
- Nitrogen gas control maintains required nitrogen content.
- . Temperature control accounts for heat losses from vacuum and oxidation reactions



Continuous Casting | CC

PROCESS STABILITY & QUALITY CONTROL

- Tundish temperature management, mold oscillation control, and EMS optimization ensure stable casting conditions and defect prevention.
- Adaptive secondary cooling, solidification modeling, and soft reduction minimize segregation, cracking, and stress.
- ٠ Mixing zone management and dynamic cut length optimization maintain chemical consistency and reduce scrap.
- . Automated defect detection and real-time monitoring enhance quality control.



CONTROL



Streamlined control over production, inventory, and synchronized processes ensures consitent output.



OPTIMIZATION Recipe management and adaptive adjustments drive continuous process optimization.

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Concept

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