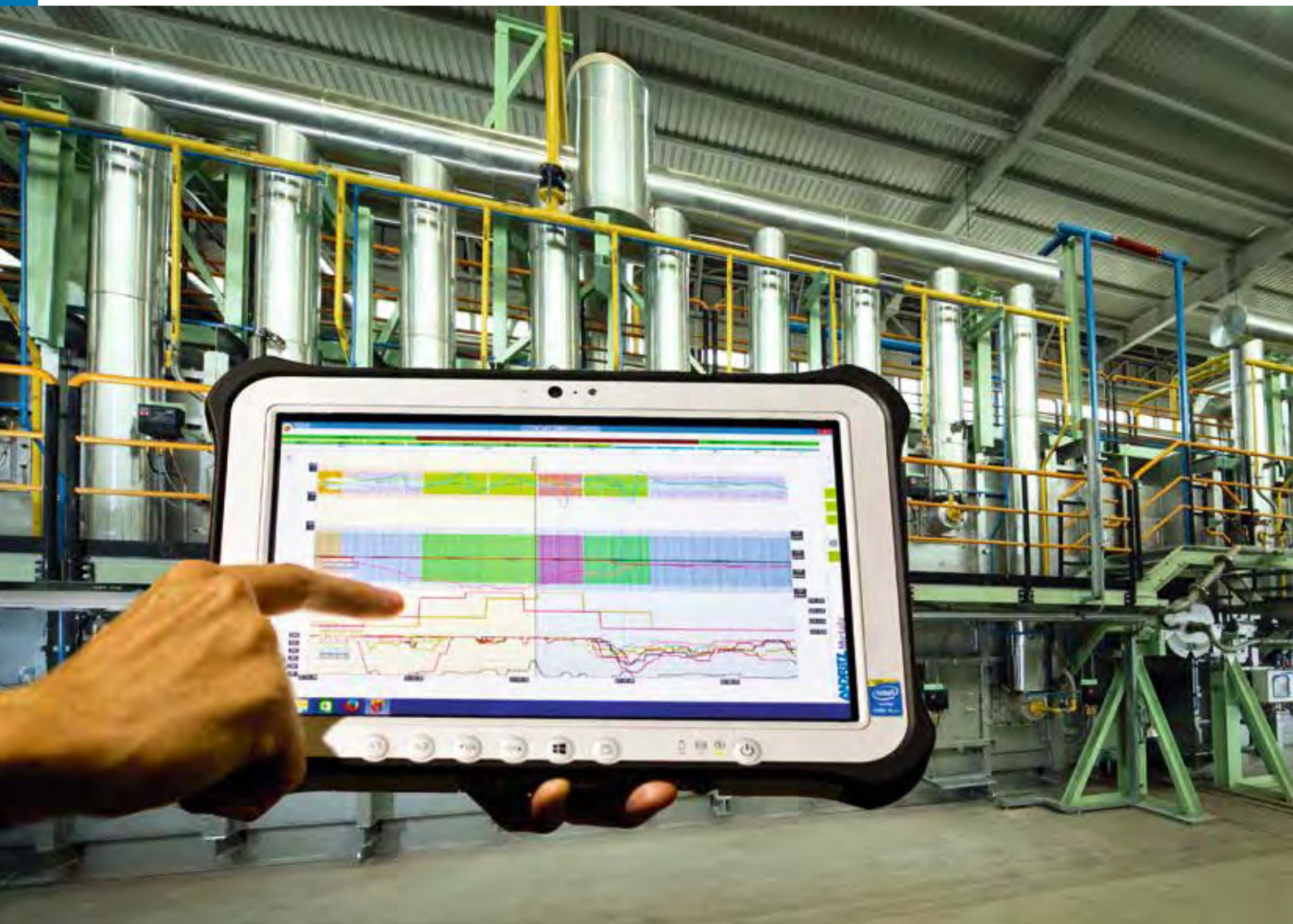


Level 2 applications for the metal industry



30 years competence in modeling and MES

New and modern production environments have significantly raised the expectations for quality, efficiency, and reliability of industrial processes during the last decade. It became necessary to replace traditional schemes of control with smarter solutions to obtain results with competitiveness in today's markets. Part of these smarter solutions is a means of gaining more knowledge on the process state, dynamics, and trends, for which traditional measuring is not adequate. ANDRITZ accepts the industry 4.0 challenge in being one of the leading companies to implement plant automation technologies of the future.

Manufacturing execution systems (MES)

Characteristics

- Modular design — easy modifications and extension of functionality
- Splitting and/or joining of material units
- Supports easy scheduling for production
- Reporting tools for web, file, or printed reports

Common applications

- Material tracking
- Coil sequencer (automated rule-based product sequencing)
- Automated quality notification system (AQNS)
- Level 3 communication interface
- Advanced reporting
- Maintenance and utilities
- Manual inspection, and interfaces to automatic inspection systems
- Coil identification (barcode processing)

Rolling mill applications

- Mill management system
- Roll shop management

Advanced furnace control models

Characteristics

- Furnace modeling with an accurate physical model
- Realistic offline simulation
- Predictive control with optimization strategies
- Observer principle (self-adapting model)
- Immediate response to external influences
- Real-time history/prediction chart

Benefits

- Increase productivity
- Reduce energy consumption and emissions
- Maximize target temperature compliance
- Reduce maintenance costs

Process models

Characteristics

- Proven process optimization
- Dynamic calculation of major process parameters
- Reporting tools for web, file, or printed reports
- High shift-independent quality

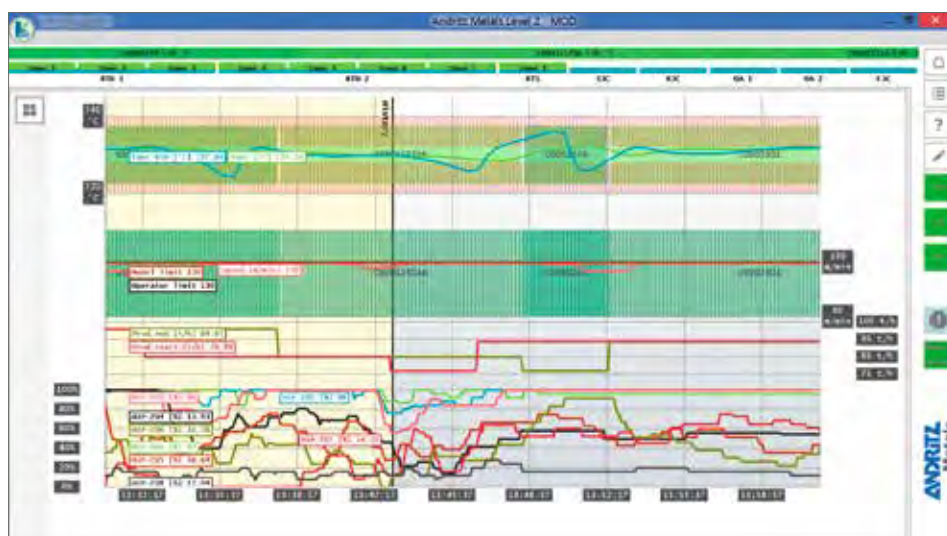


▲ Screenshot of manufacturing execution system

One architecture for all

ANDRITZ METALS level 2 products

Products	Field of operation
Advanced furnace control	<p>Continuous carbon steel strip annealing/galvanizing furnaces (for indirect fired/radiant tube heating, and direct fired furnaces), including cooling sections</p> <p>Continuous stainless steel strip annealing furnaces, including cooling sections</p> <p>Walking beam and pusher type furnaces</p>
Process models	<p>Stainless steel pickling (mixed acid, HNO₃, H₂SO₄, and neolyte dosing models)</p> <p>Carbon steel pickling with process optimization for throughput and energy savings</p> <p>Aluminum treatment sections, including degreasing, pickling, and conversion</p> <p>Scalebreaker and shotblaster units</p> <p>Rolling mills — pass calculation and optimization</p>
Manufacturing execution systems	<p>Strip processing lines</p> <p>Rollshop management</p> <p>Coil sequencer — production planning tool for optimizing the material sequence based on configurable rules</p>



▲ Screenshot of advanced furnace control

Technical facts

All major software development work is conducted in Microsoft .NET Visual C#. This ensures compatibility with all MS Windows operating systems and architectures (32bit, 64bit). Certain parts of the mathematical models are developed in Microsoft C++ or nVidia CUDA technology to achieve fastest possible calculation time and

highest accuracy. Standard databases, like MS-SQL and Oracle, are used for data storage.

What you can expect from us:

- Server/client architecture (secure access from anywhere)
- Full redundancy (hot stand-by)
- Common database, alarm, and L1 interfaces
- Hardware virtualization support (VMware)
- Optional service and maintenance contracts
- Optional intuitive touch-based user interface
- Smart tablet and wireless support
- Easy day-to-day operation, simple workflows
- Comprehensive data recording and reporting
- On-site or classroom training
- In-house software development and know-how
- Continuous R&D activities and improvements



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