

METALSMASTER AFC AUTOMATIC FLATNESS CONTROL

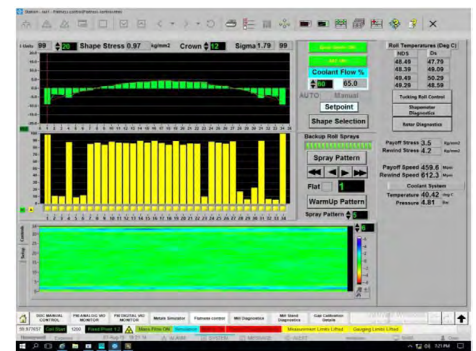
MetalsMaster integrated solutions for sheet and foil rolling achieve higher speeds, tighter gauge quality, improved flatness, and higher yields.

Automatic Flatness Control (AFC) provides a supervisory control of multiple actuators sets to maintain the measured strip cross-directional flatness at the target settings.

Depending on mill and operating mode, the actuators will include combinations of work roll coolant spray flows, roll bending, mill tilt (differential roll gap or rolling load) and variable-crown roll.

AFC involves managing a complex set of interactions between thermal and mechanical actuators.

MetalsMaster does this and, due to the seamless integration of AFC with Automatic Gauge Control (AGC) in MetalsMaster's high-speed real-time controller, can manage interactions between AGC and AFC variables for total mill optimization.



FEATURES AND BENEFITS

- Closed-loop control of strip flatness using any combination of coolant sprays, mill tilt, roll bending and variable crown rolls, plus Edge Calcoil which assists with edge flatness control.
- Multi-Variable modeling isolates various mechanical and thermal actuators including bend, tilt, and sprays.
- Single-window AFC Operator Interface.
- 6-Hi Mill configuration with Intermediate work roll bending and
- Intermediate work roll shifting which provides better flatness control.
- Available variable-crown (VC) roll controls provide enhanced flatness control performance, especially during transition operations of the mill, such as when changing widths or thickness requiring time to stabilize at a new thermal equilibrium in the mill rolls.
- Interface to common shapemeters, including solid-roll and air-bearing designs. Profibus, TCP/IP or hard-wired interfaces are available.
- Available interface to common spray bars, via Profibus or analog signals.
- Integrated with AGC for optimization of speed consistent with good gauge and flatness quality.
- Intelligent pulse width modulation of spray solenoids emulates flow control with minimal disturbance to coolant supply pressure. Optional Coolant Temperature and Pressure controls.
- Available manual spray panel for remote operation of coolant spray flows.
- Total Mill Optimization by optimizing bending, sprays levels and load to achieve the fastest mill speed.

EDGE FLATNESS CONTROL - CALCOIL

- Provides localized precision heating of work rolls near the strip edges, without contacting either the rolls or the strip.
- Fast response for instantaneous correction of flatness errors.
- Rapid correction of work rolls thermal profile when changing widths or passes.
- Eliminates the need to use edge "hot oil sprays."
- Significant energy savings versus edge hot oil sprays.
- Improves flatness quality.
- Reduce strip breaks for higher yields, reduced splices, and higher productivity via increased rolling speeds.

DESCRIPTION

High Performance

MetalsMaster utilizes a high-performance controller with real-time operating system to provide cycle times as fast as 10 ms.

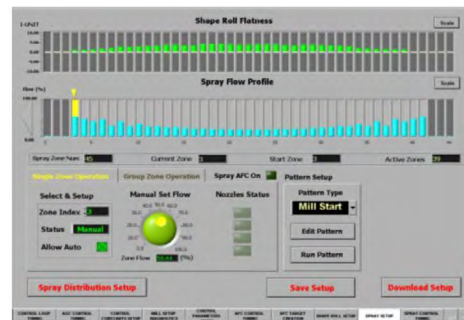
FLEXIBLE APPLICATIONS

Multiple I/O methods include analog (hard wired), Profibus DP, Profinet, TCP/IP, EtherCAT links and customized communications to most common spraybars and shapemeters.

On-screen engineering tools allow engineers to monitor and/or modify I/O assignments, optimization and control parameters, quality data, control mode selection and fault conditions and diagnostics.

ENHANCED VISIBILITY

Real-time, intuitive human-machine interface (HMI) provides instant visibility into mill operating state, AGC and AFC performance, trends, alarms, and process information so operators know what's happening and can take quick action in the event of abnormal situations.



EASY CONFIGURATION

Alloy Recipe Handling - Product information for sensor calibration and control tuning parameters are stored by alloy and gauge thickness in easy-to-manage recipes.



Honeywell Process Solutions

2101 City West Blvd, Houston, TX 77042

Honeywell House, Skimped Hill Lane Bracknell,
Berkshire, England RG12 1EB UK

Building #1, 555 Huanke Road, Zhangjiang
Hi-Tech Industrial Park, Pudong New Area,
Shanghai 201203

process.honeywell.com

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