MetalsMaster™ AFC
Automatic Flatness Control
Product Information Note

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 actuator 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 & 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
- 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
- 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 speeds
- Interface to common shapemeters, including solid-roll and air-bearing designs. Profibus, TCP/IP or hard-wired interfaces are available.
Honeywell's non-contacting thickness sensors perform on-line aluminum sheet and foil thickness measurements, helping rolled aluminum producers achieve faster rolling speeds, tighter gauge quality control and reduced mill downtime.

The high-speed, high-flux X-Ray sensor technology ensures 0.1% or better typical accuracy, while rejecting on-line sources of error such as changing sheet position, pass-angle, oil or coolant oxides buildup and mill ambient air temperature. The sensors handle wide measurement ranges and for most applications, a single sensor provides optimal entry or exit readings.

Mounted on a rigid, welded-box-beam steel C-Frame, the compact sensor head construction meets rigorous rolling-mill requirements for endurance and reliability, installs easily and fits in tight mill locations.

**Measurement System Components Features & Benefits**

- Unique alloy-insensitive measurement mode ensures thickness accuracy for critical finishing passes. The single-sensor/dual-mode configuration also offers extended range to handle a wide range of foil thickness.

**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**

- 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 roll 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
- Reduces strip breaks for higher yields, reduced splices and higher productivity via increased rolling speeds.

**For More Information**

Learn more about Honeywell’s MetalsMaster™ at www.honeywellprocess.com, or contact your Honeywell Account Manager, Distributor, or System Integrator.

**Honeywell Process Solutions**

1250 West Sam Houston Parkway South
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

www.honeywellprocess.com

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