ABB Ability™ Optimold Control for EMBR
Performance optimization for thin slab casting

The ABB Ability™ Optimold Control closes the loop between electromagnetic actuators and sensors and provides real-time, automatic online control of mold fluid flow. Via higher utilization of the EMBR’s capacity and performance, near meniscus conditions can now be influenced even more than before, enabling steel producers to reach as yet unprecedented levels of quality and process optimization in thin slab casting.

Overview
Though the ABB Electromagnetic Brake (EMBR) is installed on over 40% of thin slab caster strands worldwide and already generating improvements in both productivity, end-product quality and profitability in thin slab casting, digitalization provides us with new tools for enhancing the performance of existing products and unlocking added value for our customers.

Customer need
Traditional control of electromagnetic devices such as the EMBR has been deterministic in nature, based solely upon macroscopic casting parameters such as casting speed and slab format, and characterized by manual intervention by the operations staff. Mold plate temperature measurement devices such as the ABB Ability™ Optimold Monitor, with its unrivalled spatial resolution and high-resolution fiber-optic sensors, can provide a wide range of actionable insights on casting events in the near meniscus area such as meniscus fluctuations, biased flow, irregular flow patterns or improper meniscus flow speeds. Where the ability to detect, react and/or counteract deviations in the process has been limited there is now untapped potential to optimize operations.
**ABB solution**

ABB Ability™ Optimold Control uses the power of digitalization to elevate the EMBR and the ABB Ability™ Optimold Monitor into a closed-loop and provide for optimal casting conditions via automatic, real-time control of melt flow speed, symmetry and stability. Utilizing high resolution sensor feedback from the ABB Ability™ Optimold Monitor, variations in the casting process which may otherwise have been missed are quickly identified and automatically corrected via control algorithms. This enables steelmakers to maintain product quality and process stability and avoid costly downgrades. Taking advantage of the EMBR’s flexible front core configuration the ABB Ability™ Optimold Control can independently control its left and right sides allowing it to work with any submerged entry nozzle (SEN) shape.

**Features**

- Transforms actionable insights into real-time process improvements
- Captures a significantly wider variety of unwanted casting events than traditional systems
- Optimizes operation of the EMBR via automatic, closed-loop, control
- Allows independent control of the EMBR’s left and right sides
- Compatible with any shape of submerged entry nozzle (SEN)
- Can be used with any mold plate temperature measurement system though for best results the ABB Ability™ Optimold Monitor or systems with equivalent resolution are recommended
- Works with the ABB EMBR or similar electromagnetic stirring and/or braking device

**Benefits**

- Allows for optimal casting conditions
- Automatic, more accurate process control
- More robust, repeatable casting process
- Improved productivity
- Higher product quality
- Optimized energy consumption
- Safer working environment with less manual intervention