MOLD LEVEL CONTROL
Elektrics and Automation
MOLD LEVEL CONTROL
Automatic start, reliable process

THE CHALLENGE
The continuous casting process has developed to a high technological level over the last decades. Only a few parameters remain to allow an increase of plant availability, production capacity as well as an improvement of product quality. One of these parameters is the mold level.

Fluctuations of the mold level have a negative effect to the surface quality and therefore to the production as well. The fluctuations can lead to a downgrading of the product quality, increase the breakout risk and might require a manual operator intervention. This can finally lead to yield losses.

A constant mold level is therefore decisive for the quality of the generated product. The mold level control has to achieve highest standards to be able to reach this stability of the mold level. This means that it has to react to a wide range of various process situations, and at the same time easy to handle and easy to maintain.

THE SMS SIEMAG SOLUTION
SMS Siemag’s mold level control has a leading market role due to the close cooperation with leading steel companies and the consolidation of own synergies between mechanical design, automation, process control and metallurgy - thereby holding a complete solution in one hand.

Constant mold conditions and highest productivity and quality are reached through optimum adjustments of the individual components.
TECHNOLOGICAL HIGHLIGHTS
The mold level control consists of a suitable hardware platform and parameterizable software, whose functionality has been deployed successfully more than a hundred times worldwide.

The continuation of further developments meets the ever increasing quality standards of the products.

FULLY AUTOMATIC START OF CAST
The mold level control allows a fully automatic start of cast to improve the start of cast behavior and provides a constant mold level during the process.

AUTOMATIC ZEROING
The automatic detection of the closed stopper position.

SMOOTH TAKEOVER BETWEEN OPERATING CONDITIONS
Smooth takeover from hand to automatic as well as between different measuring systems.

MINIMISING OF BULGING EFFECTS
The controller recognizes natural waves and fluctuations, evoked a. o. through dynamic bulging and minimizes the emerging impact of the mold level.

DYNAMIC ADAPTATION OF CONTROLLER PARAMETERS
Automatic and dynamic adaptations of the controller in connection with the boundary values such as steel quality, caster dimension or casting speed using the online-FFT (Fast Fourier Transform) during the casting process create the preconditions for an ongoing optimized casting process.

EARLY IDENTIFICATION OF INTERFERING FACTORS
Interfering factors such as adherences on the stopper i. e. SEN (clogging) or erosions at the stopper hub are identified in good time to introduce counteractive measures by the system.

STOPPER ROD FEED FORWARD CONTROL
Look ahead positioning of the stopper for an optimum reaction to different influences.
**SEN WEAR PROTECTION**
The mold level set point is automatically varied to minimize wear on the SEN.

**AUTOMATIC EMERGENCY CLOSE OF THE STOPPER ROD AT BREAKOUT**
The stopper rod will be closed automatically at the detection of a breakout to minimize its impact.

**OPTIMIZED FOR RADIOMETRIC OR ELECTROMAGNETIC MEASURING SYSTEMS**
The mold level control has the ability to work with various mold level measuring systems (radiometric and/or electromagnetic).

**FREE CHOICE OF ACTUATORS AND CONTROLLING PROCEDURE**
The steel in-flow can also be carried out via a stopper or a slider. The execution of the drive can be either effected hydraulically or electromechanically. The mold level control can work just as well as a withdrawal control.

**STATISTICAL ANALYSIS**
Statistical analysis for the qualitative identification of the control accuracy and determination of standard deviation.

**PLUG & WORK**
The automation system for each plant is tested in the test fields of SMS Siemag by the Plug & Work concept. We have equipped a test field in which the complete system is assembled and tested and optimized through realistic simulations. At the same time we can train customer teams on original control sections, cabinets and –systems with the original software. With this concept a fully functioning mold level control system and a perfectly trained team are ready at the time of commissioning.
OPERATE, OBSERVE AND ANALYSE
A user-friendly presentation of measurement data and operating modes on the HMI is extremely important. For analysis of historical data the system allows the compilation of different numbers of trend curves and signals.

CONVINCING ARGUMENTS OF THE MOLD LEVEL CONTROL:
= Fully automatic start of cast
= Automatic zeroing
= Smooth takeover between operating conditions
= Minimizing of bulging effects
= Dynamic Adaptation of Controller Parameters
= Early identification of interfering factors
= Stopper Rod Feed Forward Control
= SEN wear protection
= Automatic emergency close of the stopper rod at breakout
= Optimized for radiometric or electro-magnetic measuring systems
= Free choice of actuators and controlling procedure

= Statistical analysis
= Modular software design, a precondition for future developments
= "Plug & Work"
= Suitable for modernization for any type of continuous caster plants
"The information provided in this brochure contains a general description of the performance characteristics of the products concerned. The actual products may not always have these characteristics as described and, in particular, these may change as a result of further developments of the products. The provision of this information is not intended to have and will not have legal effect. An obligation to deliver products having particular characteristics shall only exist if expressly agreed in the terms of the contract."