MMS PLUS
MOLD MONITORING SYSTEM
Electrics and Automation
THE CHALLENGE

The continuous casting process has developed in the last few decades to a high technological level.

Only a few parameters remain to allow an increase of plant availability and production capacity as well as to improve product quality.

One of these parameters is the mold technology with the mold process flow.

SMS Siemag recognises the possible influences of the process flow and has developed special systems to fulfil the requirements to an optimum.

THE SMS SIEMAG SOLUTION

The use of the MMS plus mold monitoring system is essential to increase plant availability and improve product quality.

Temperature measurements by means of thermocouples at the mold copper plates serve to control the process flow of the mold. This solution has been proven to be the most suitable and most reliable.

Disturbances in the growth of the strand shell, bad casting powder distribution, SEN misalignment, insufficient taper settings and bad material stream characteristic in the mold can easily be monitored and/or controlled by means of the sensors. Thus production losses and high repair costs can be reduced to a minimum.

MMS PLUS

The MMS plus combines state-of-the-art sticker detection, longitudinal facial crack detection and mold thermal mapping algorithms. The modular architecture of MMS plus allows the implementation of future developed packages. Furthermore it assures a very easy integration for modernisation purposes in any existing casting machine.
MMS PLUS – PACKAGES

PREDICTION OF STICKER BREAKOUTS
Casting of different steel grade, at various and often high casting speeds, has resulted in the need for a system which is capable to recognize potential breakout risks and reduce them. This leads to a high productivity.

DETECTION OF LFC
Different longitudinal facial cracks (LFC) types are accompanied by a local characteristic disturbance in the heat extraction in the mold. The LFC detection leads to quality loss warnings.

3D MOLD TEMPERATURE MAPPING
The mold temperature mapping provides 3D-on-line information on the heat distribution from the mold as well as on the contact between the strand shell and the copper plates.

AUTO ADAPTIVE ALGORITHMS
Boundary conditions, such as varying steel grades, absolute temperatures, casting powder, different coating material or re-machining of copper plates are implicitly compensated by the auto adaptive algorithm.

“AUTODETECT” – EQUIPMENT DIAGNOSTICS
Permanent plausibility checks of sensors reduce malfunctions and minimize the false alarm rate.

“FLIGHT RECORDER” – SIMULTANEOUS PROCESS ANALYSIS
The system enables the analysis of previously recorded data by playing back complete casting sequences. This allows optimising the process and the system in respect of changed conditions (new steel grades, casting powder, casting speed by means of simulation. The plant operator obtains in-depth knowledge about the correlation between breakout risks and operating practice.

OPERATE, OBSERVE AND ANALYZE
A user-friendly presentation of measurement data and operating states on the visual display is extremely important. Different operation states are indicated and essential information is shown. For the analysis of historical data, the system allows the compilation of any number of trend curves and signals.

INNOVATION - HD-MOLD
The integration of fibre-optical based measurement systems in the mold leads to a revolutionary improvement in signal acquisition:
- Higher resolution of temperature measurement in terms of place and time.
- Higher measuring accuracy.
- Free sensor arrangement in terms of height and width.
- Total electromagnetic insensitivity.
- Absolute free of maintenance throughout the whole service life of the copper plates.

CONVINCING ARGUMENTS OF MMS PLUS:
- Auto adaptive algorithms avoiding breakouts from the first heat on.
- Independence from steel grades, absolute temperatures, casting powder, different coating material and different copper plate thickness.
- Decrease of sticker breakouts by over 90%.
- Safe detection of longitudinal facial cracks.
- Evaluation of casting powder effectivity.
- Automatic detection of bad thermocouple signals and their consideration.
- “Flight recorder” for analysis of historical data.
- Modular software design, a precondition for future developments.
- “Plug & Work”.
- Convenient for modernization of any type of continuous casters.
“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.”