RealTimeCastSupport

Embedded real-time analysis of continuous casting for machine-supported quality optimisation

Webinar on 8th of September 2023

Introduction

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- > Thermal and fluid-mechanical conditions in continuous casting moulds are only roughly known although highly relevant for the product quality.
- > Operational windows for lubrication, mould heat transfer and shell growth were developed but did not provide a real-time process control.
- > Fibre Optic Temperature Sensors (FOTS) were successfully implemented in the mould copper.
- > It was found that insufficient mould powder coverage has a tremendous influence on the strand surface quality.
- > Anomalous casting conditions were identified with innovative sensors but could not be implemented in real-time.
- Continuous temperature measurement system with an optical fibre in the melt (DynTemp) was developed but not tested in the mould until now.



- Optimisation of surface quality of heavy plates and hot strips is a serious problem.
- Manual process control is difficult due to the big number of influencing factors.
- Up to now direct measurements in the area of early solidification are not possible.
- Operational monitoring is limited to the interpretation of several indirect measurements.
- Interaction of melt temperature flow and phase changes, casting powder and heat transfer are extremely complex.
- Assessment of data is difficult because feedback from quality supervision is only available hours or days later.



- Improved <u>product quality</u> in terms of reduction of hard spots on heavy plates and slivers on cold-rolled strips
- Online monitoring of tundish and mould with implementation of new measuring techniques
- Exploitation of various CC data and surface inspection to assess risk of quality issues
- Exploitation of big data technologies and digital twins
- Advanced CC process control in real-time offering machine supported decisions

Proposed measures





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Measurement locations





Surface inspection Quality control













Thank you for your attention!

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