



SLAGMON

QUALITY-BASED TAPPING THROUGH INFRARED SLAG IDENTIFICATION

Minimized slag transfer is essential for maximizing steel output and increasing steel quality. Knowledge of slag conditions reduces quantities of deoxidizing and alloying agents, lowers rephosphorization and improves steel desulphurization. Steel analyses are far more accurate when the amount of transferred slag is reduced to a minimum, and the lifetime of the steel ladle refractory can also be significantly increased.

YOUR CHALLENGE

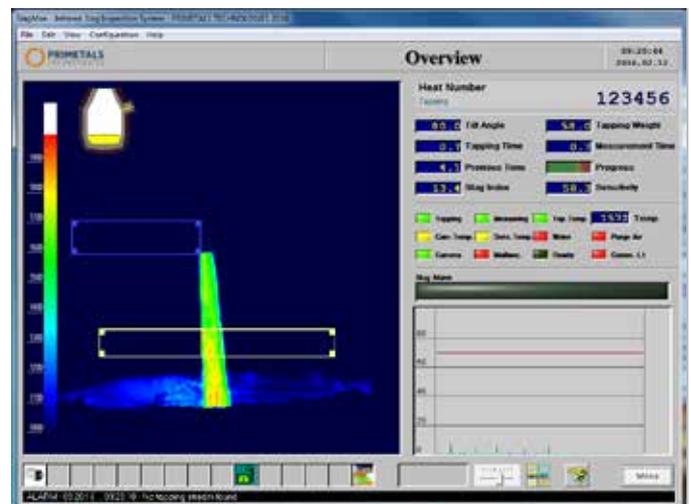
Slag detection equipment should be installed without any modifications of the converter. This equipment should be free of wear parts and be accessible for maintenance at all times. The system should be compatible with common process control systems and all available gate units, and also be applicable as a stand-alone device.

The slag detection equipment should distinguish itself through high availability, long maintenance cycles and virtually failure-proof operation. The equipment should consist of an infrared camera with long calibration cycles and the entire construction must be able to withstand extreme operating conditions.

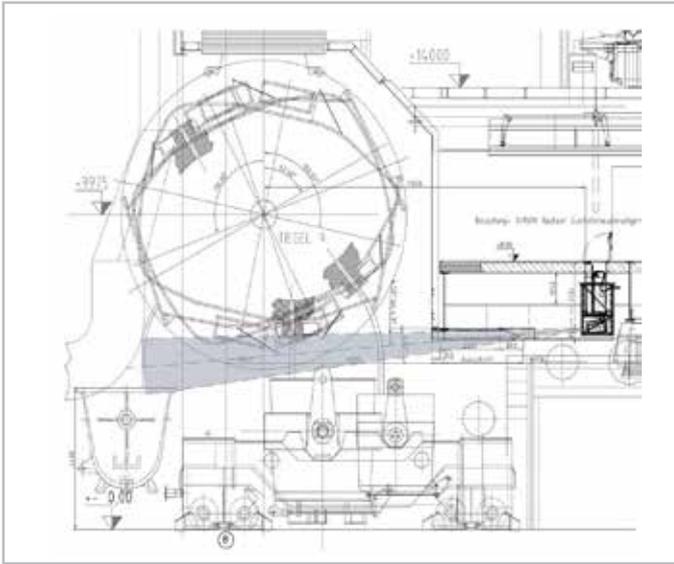
The system should include data archives for offline analysis in order to store data files containing all significant values files for every tap.

OUR SOLUTION

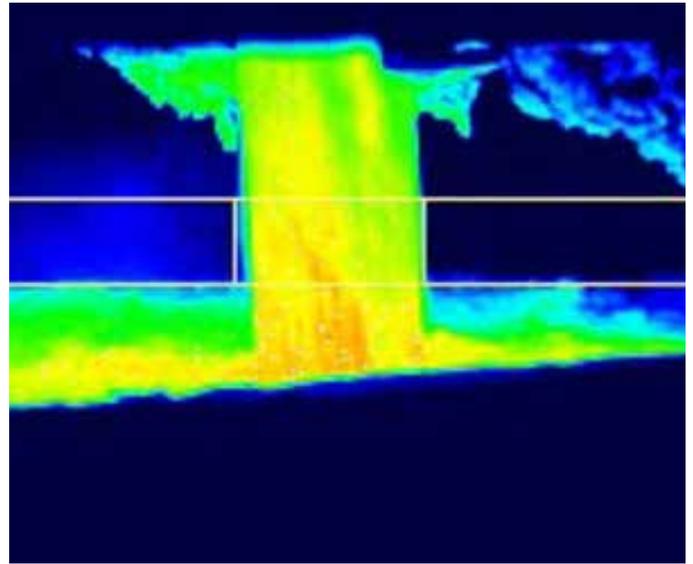
The thermographic slag identification system, SlagMon, is a rapid and reliable method of early slag detection. It offers real-time, permanent monitoring of the tapping stream using an infrared camera through which a quick and reliable differentiation between steel and slag is achieved. Detected slag leads to a trigger signal for the activation of a tap hole closing unit and/or an alarm signal.



SlagMon overview



Positioning of SlagMon in safe area of the converter



Steelstream with ROI - Region Of Interest

PROCESS

The thermographic slag detection system, SlagMon, represents an accurate method of exploring the tapping stream. Due to the different emissions of radiation in the infrared range, it is easy to differentiate between steel and slag.

The system, including an infrared camera, visualization, industrial PC and an evaluation unit, offers continuous and real-time observation and visualization of tapping operation.

SlagMon generates an alert signal if slag is detected, which can be utilized to control the locking device of the tap hole. Depending on the site situation, it is also possible to use this measuring principle during slag dumping in order to recognize flow of steel and subsequently maximize the output.

PROPERTIES

The infrared camera is set up at a protected, easily accessible location at a certain distance (up to 30 meters) from the converter. It is well protected by its watercooled housing which includes an intergral air-jet lens cleaning system. Operating personnel can follow the tapping and slag-dumping operations on site and obtain all significant process parameters (e.g. tapping duration, converter angle, tapping weight, system status) from the visualization screen.

A special image processing algorithm continuously evaluates and archives the generated image. In case of slag carry-over, an alarm is generated, triggering the respective gate unit (e.g. slag stopper).

The use of fiber optic cables guarantees safe and steady data transmission for accurate, real-time detection of slag.

RANGE OF APPLICATION

SlagMon can be used for BOF as well as EAF plants.

MAIN BENEFITS

- Improved steel quality thanks to accurate slag detection
- Reduced conversion costs due to reduced quantities of deoxidizing and alloying agents
- Operator-friendly visualization of all significant process parameters
- The device can be used with all known gate units or as a stand-alone device
- Accessible for maintenance at all times thanks to its positioning in distance from the converter
- Detailed offline analyses containing all significant values of every tap, stored in data archives

TECHNICAL DATA

Wave length	3,9 µm
Profibus link	yes
TCP/IP data transfer	yes
LWL	50 and 62.5 µm
Power supply	230 V
High availability	98 %
Frame rate	50 n frames per second
Camera resolution	640 x 480 pixel
Motor driven focus lens	yes

Infrared camera made in Europe

Primetals Technologies Austria GmbH

A joint venture of Mitsubishi Heavy Industries and partners

Turmstrasse 44 | 4031 Linz | Austria
primetals.com

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