Thermal monitoring of Casting Ladle during Metallurgical Processes

The use of casting ladles for steel is currently one of the most used processes in the metallurgy. In order to ensure that the casting ladle, as a basis for the ladle metallurgy, has a sufficient service life, it must be made from high quality refractory materials. However, during its use, it gradually wears out due to the erosive and corrosive effect of the molten steel, which can in extremity result in a tear and subsequent accident. The wear process can be slowed down by the proper use of the ladles that resides in keeping their work temperatures high and constant in ideal case. It is also necessary to ensure a quality permanent lining and insulation layer of the ladle.

Task Setting

The recommended temperature stability of the ladle can be ensured only by continuous operation monitoring. For the ideal monitoring system, there must be a valid requirement for the continuous operation. Then, the system needs not only to constantly evaluate the temperature in the area of interest, but also to be able to respond on its own to any suspicious temperature increase in the area of interest and thus to alert the operator in time. An ideal solution in this case could be a SMARTIS smart camera system of Workswell.
Task Solution

The Workswell thermographic system, suitable for this application, uses SMARTIS infra-red camera technology to monitor the temperature of the casting ladle surface. During operation, all ladles can be observed by up to 16 thermal imaging cameras simultaneously. Continuous temperature measurement is performed completely automatically without a manual intervention. The number of a particular ladle can be distinguished from the characters on its surface and in the infra-red spectrum if necessary. If the adjustable limit of the temperature is exceeded, the thermographic control system using a special software automatically activates alarm and alerts the operator. The alarm reliably prevents dangerous accidents caused by the liquid steel.

It is possible to maximise the service life of the refractory casting ladle without safety constraints, as well as the economic production efficiency by using the thermographic monitoring. At the same time, the system is highly reliable and usable in various situations and applications.

Properties of the Thermographic Inspection System
- Fully automated even in full operation
- Reliable alarm activation at defined temperature limits
- Record and analysis of the temperature evolution for all active casting ladles
- The operator display mode allows continuous supervision, display and evaluation
- Easy data access
- Possibility of remote access

Advantages of the Thermographic Monitoring System
- Complete automatic temperature sensing of the outer surface of the casting ladles
- Timely detection of hotspots
- Safe protection against the casting ladle crack ensures a safer working environment, but also a longer service life
- Flexible system to adapt to your operational needs
- Return on investment in less than one year

All Workswell thermal imaging cameras are always designed for the respective application. In this case, they are supplied in robust cover so that the whole system resists rough