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TECHINT GROUP

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Lining Management System for Submerged Arc Furnaces

TENOVA is a world-wide supplier of advanced technologies, products and services for the metal and mining industries.

Tenova is a worldwide supplier of advanced technologies, products and services for the metal and mining industries providing innovative integrated solutions. Combined process automation and metallurgical know-how enhance the value delivered to the customers. Tenova is committed further to develop its technology in the areas that mostly impact the future of the industries it serves: quality of the products delivered by the customers, energy saving and environmental safeguard.

Tenova Pyromet is a leading company in the design and supply of high-capacity electric submerged-arc smelting furnaces and complete smelting plants for the production of ferroalloys, base metals, slag cleaning and alloy refining.
Tenova Pyromet has a long and successful history in the ferroalloy industry and also designs and supplies equipment for material handling and pre-treatment, alloy conversion and refining, granulation of metal, matte and slag, furnace off-gas fume collection and treatment, treatment of hazardous dusts and wastes.

The company has been certified to ISO 9001:2008 for "The Design and Supply of Smelting Technology and Equipment".

Tenova Pyromet The Lining Management system provides the operations staff with tools to predict long term lining life and process optimisation. The Lining Management system will prove to be of huge benefit to any furnace operation. It is the only means to get detailed information on your ever changing refractory lining.

BENEFITS

The Lining Management System (LMS) is a tool developed by Tenova Pyromet which gives the ability to constantly monitor the furnace refractory lining.
The LMS monitors the refractory wear and hot face temperatures at various points in the furnace, and have the following main benefits:

- Prolong refactory life.
- Identify problem areas, and gives sufficient warning to take remedial action.
- Prevent costly down time from burn throughs.

FEATURES

The Line Management System provides vertical and horizontal furnace sections that visually show the following:

- Estimated isotherms.
- Refractory Wear.
- Initial Lining.

The above sections provide an instantaneous full profile view of the initial lining and refractory wear, including estimated shell and refractory hot faces temperatures.
The LMS also includes a system for identifying faulty thermocouples. If a thermocouple is faulty, the system will display an error message, and raises an alarm.
The LMS can trend all captured data by means of the management trending facility. This facility also has the ability to trend and compare any measured or calculated value against one another.

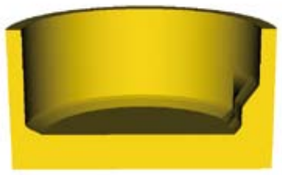
The trending facility provides management with a tool to estimate remaining lining life and understand the effect of specific operating practices on lining wear and crucible conditions.

The LMS can draw up of the following 3D images:

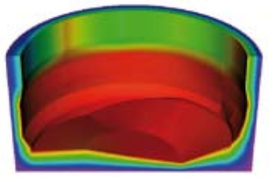
- The initial lining of the furnace when it was commissioned.
- The remaining refractory for the furnace.
- Freeze lining buildup in the furnace.
- Isothermal view of the furnace refractory hot face.

The various images give the furnace operator an overall view of the current lining conditions.

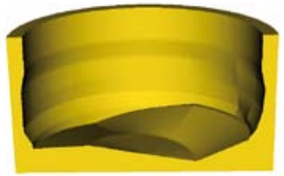
The LMS calculation module provides real–time refractory wear, heat flux, hot face temperature and shell temperatures.



Initial Lining



Hot Face



Lining Wear

CONCLUSION

The Lining Management System provides operators with instant information on lining and crucible conditions based on real time data. The LMS provides knowledge that can be used to insure the longest life possible for refractory and effective and efficient running of a furnace.