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EAF monitoring Solution By HERAEUS Electro-Nite

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Dear Scientific committee,

As the global market leader in monitoring and measurement solutions for steelmaking processes, Heraeus Electro-Nite is dedicated to advancing the industry through innovation. Our commitment to research and development enables us to deliver disruptive technologies that enhance efficiency, quality, and sustainability in steel production.

In recent years, we have proactively developed and implemented two emerging systems and integrated field equipment solutions for the Electric Arc Furnace (EAF) environment at several leading steelmakers worldwide: Chameleon/CoreTemp and Falcon. We would like to take this opportunity to introduce these solutions, designed to significantly improve existing process control systems.

By adopting these technologies, EAF steelmakers can significantly enhance operational safety through proactive automation, including fully automated, manless liquid metal temperature and oxidation (aO) measurements. Combined, these systems deliver a more comprehensive and valuable analysis of key parameters such as effective energy efficiency, energy transfer potential, bath homogeneity, and oxidation levels.

Recent installations have demonstrated strong interest from users, as these solutions deliver real-time bath status information. This capability has been directly linked to optimized tap-to-tap times, reduced energy consumption, improved power-on efficiency, greater process stability, and a potential reduction in CO_2 emissions —all while delivering a measurable improvement in operator safety.

Chameleon/CoreTemp are both designed to remotely measure liquid steel temperature during melting and refining phases. Its main feature is the ability to monitor temperature evolution by immersing a high-speed, specialized optical fiber into the melt through a horizontal or vertical cooling panel.

Falcon is developed to remotely monitor free Oxygen (aO) in liquid steel. The system launches a dedicated sensor at high speed through the EAF side panel (carbon injector or specific injector). This measurement is done remotely and can be taken during arcing at every liquid phase of operation. It helps to monitor in the early phase of melting the effective oxidation level.
This ensures fully safe operation (no personnel at steel), improved timing efficiency (no special measuring conditions required), and valuable data on aO behavior (early FeO monitoring and oxidation levels).

Together, either Chameleon or CoreTemp with Falcon, these systems provide strong and valuable comparative information on potential energy variations, energy transfer, and homogeneity issues related to scrap, weight, and bath level fluctuations.
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Sincerely yours

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