Heat Saturation Measurement for Ladles – Closing a last Gap in Temperature Control

Before: the Heat Saturation state of ladle refractory in steelmaking was estimated based on operator experience and indirect models.

Now: our recent paper for the journal Stahl + Eisen, “Heat Saturation Measurement for Steel Ladles” from 03/2026, introduces a measurement-based approach that:

- Determines refractory thickness and inner surface temperature with high spatial resolution
- Calculates the internal temperature profile of the refractory
- Quantifies the actual Heat Saturation state of the ladle in real time

Why Does this matter: precise control of molten steel temperature in transport vessels is one of the most decisive factors in casting stability, product quality, energy efficiency, and refractory lifetime.

- The thermal state of the ladle refractory determines how much energy is absorbed from the melt.
- This is the largest unknown factor in temperature forecasting of the liquid steel cycle.
- Incorrect assumptions lead to too cool melts or by staying on the safe side, to excessive superheat, higher energy consumption, cooling scrap use, reduced casting stability, and refractory damage.

By making the thermal state of the ladle visible and measurable for the first time, Heat Saturation measurement closes a critical gap in steelmaking process control. It enables steelmakers to optimize energy usage, stabilize operations, protect refractory assets, and improve product quality, without changing the core process.

#Steelmaking #Digitalization #HeatSaturation #MINTEQ