



LaCam[®]

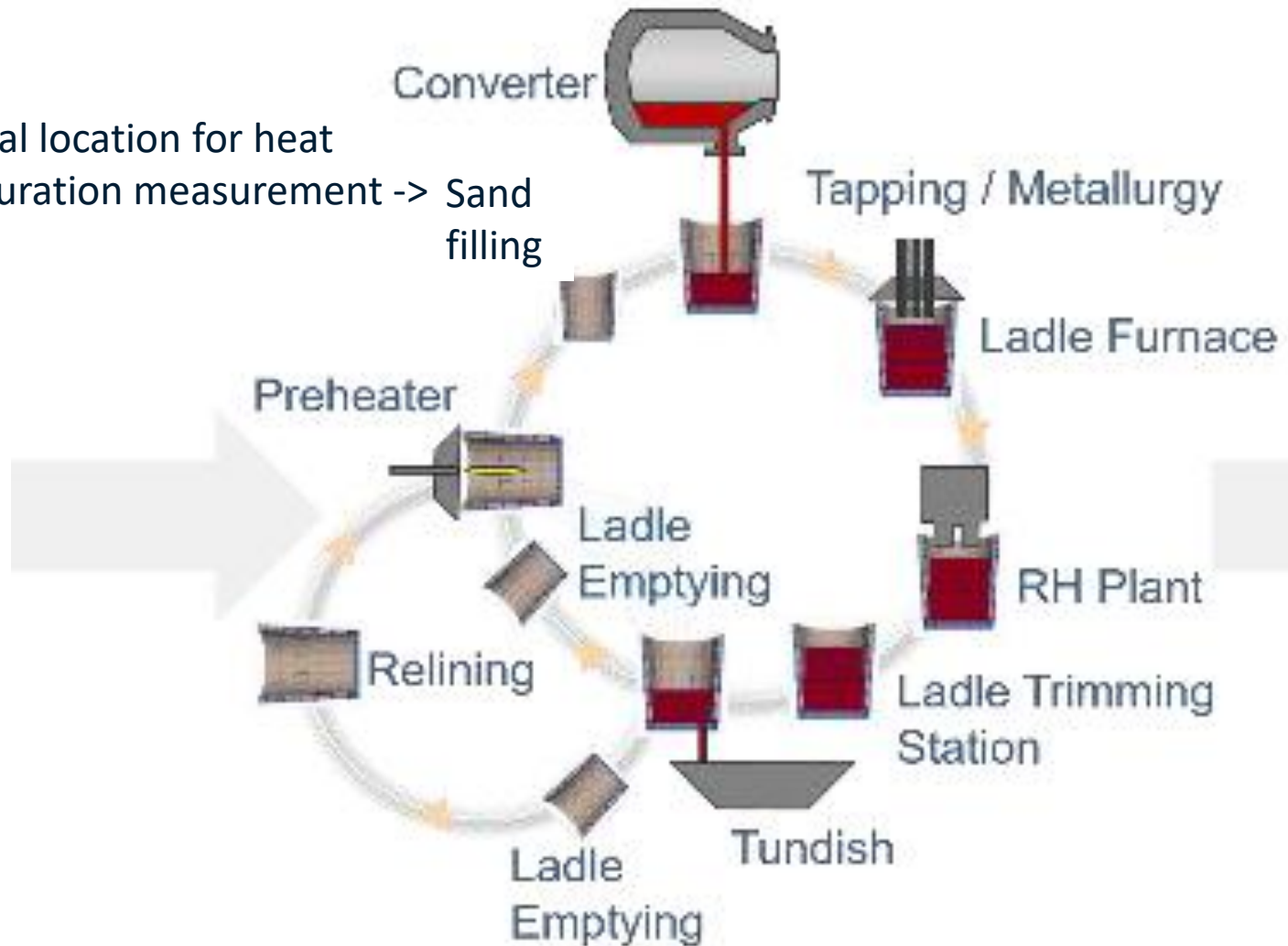
Heat Saturation

Assessing the current heat content of a vessel

- Today no measured, accurate process parameter for heat condition of vessels
- Improve steel production efficiency by giving a tool for precise thermal management and forecasting of vessels in the production process
- Optimization of gas consumption during heat up of vessels (ladle stand, converters, EAF's)
- Optimization of EAF or converter tapping temperature by precise assessment of heat-energy transfer into the ladle, at optimal target process temperature
- Optimize target heat for casting by secondary steel process EAF. Reduce temperature window of casting process by accurate temperature forecasting.
- Reduce expensive cooling scap consumption to compensate too high temps
- Minimize temperature delta of the ladle temperature versus tapping melt temperature to reduce refractory destruction (large temperature differences consume lining quickly)

LaCam[®], Heat Saturation: Ideal Position for Measurement in Temperature Cycle

Ideal location for heat
saturation measurement -> Sand
filling



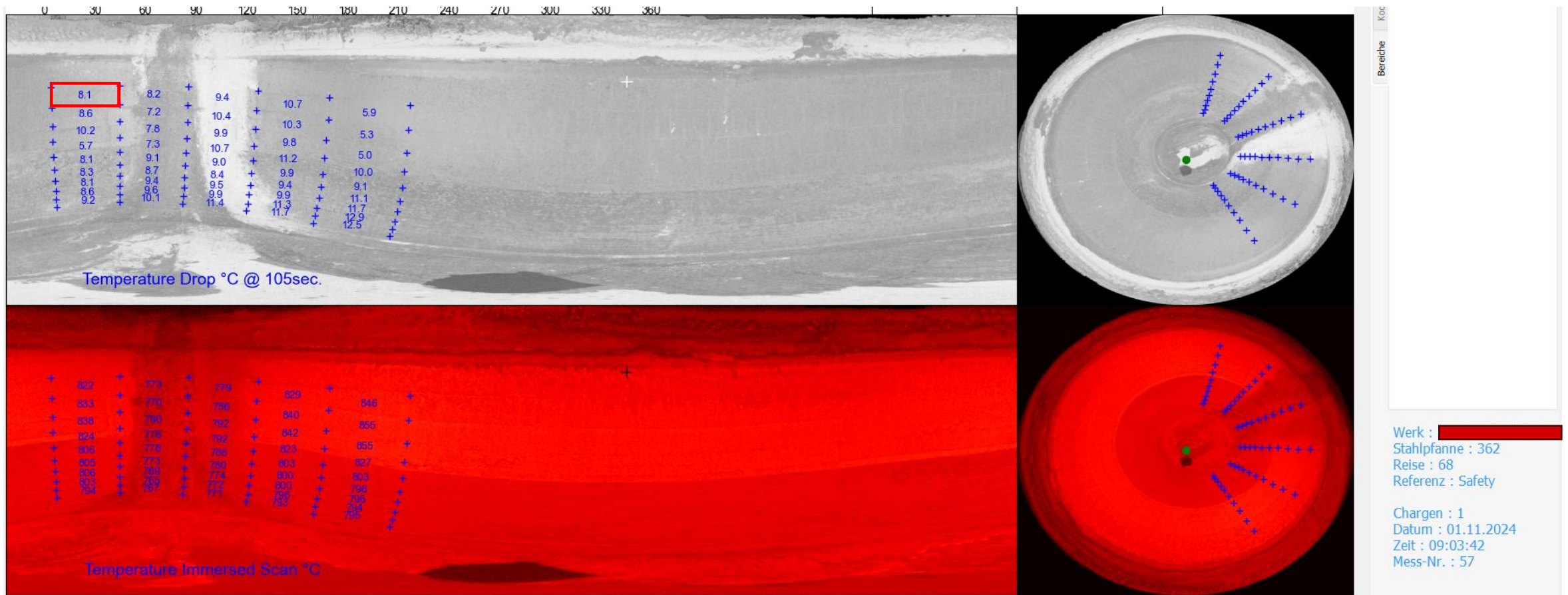
Preconditions

- Fixed installed LaCam to measure every heat in the thermal process flow
- Brick thickness needs to be measured accurately
- LaCam produces precise pyrometer data (2-color)

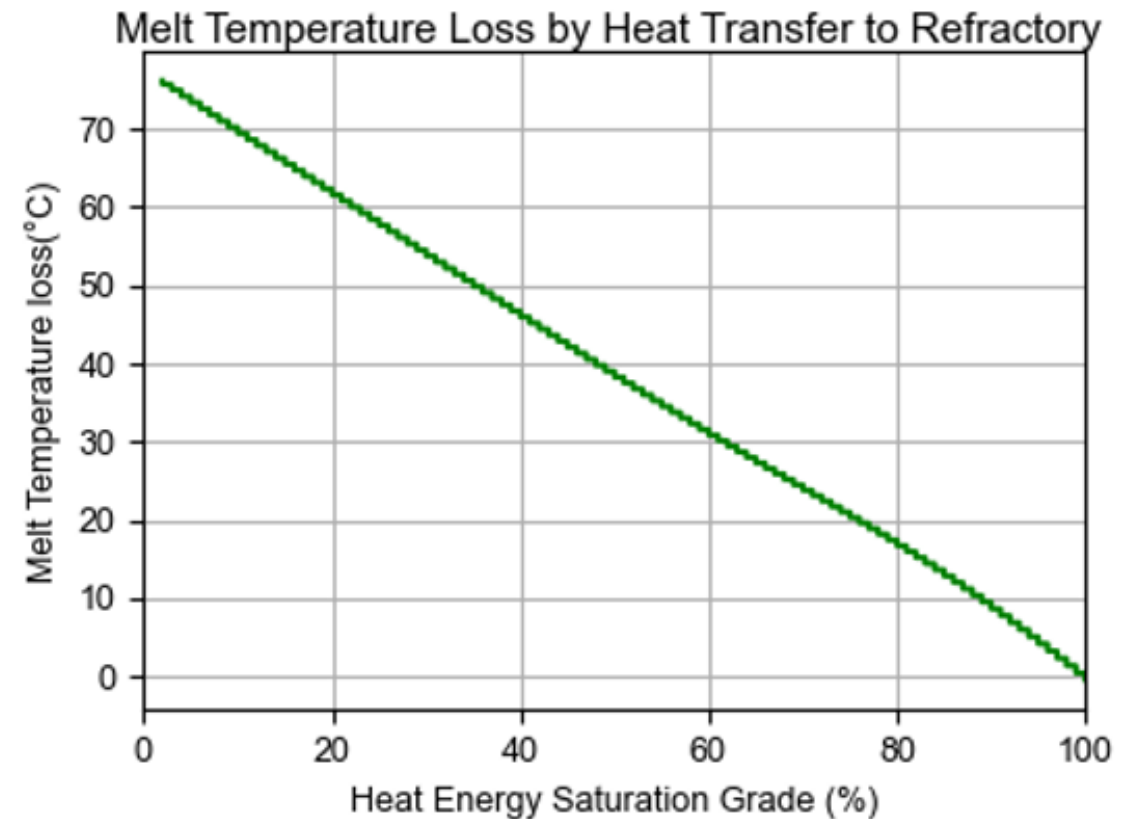
Heat Saturation Model

- Solution of heat conduction equations
- Calculation of temperature distribution along brick length
- Assessment of stored heat energy and relative heat saturation in refractory lining

Areas used for temperature measurement with a current customer:
Red box is an example to visualize the areas used



- Optimization of pre-heating gas consumption
- Compute decline of melt temperature while tapping by „cold“ ladle/vessel due to heat saturation effect
- Optimization of EAF / Converter tapping temperature
- Optimize ladle-furnace temperature for narrow casting temperature windows
- Introduce heat saturation KPI as precise measurement-point to calibrate thermal models for production cycle
- Takes out subjectivity of thermal state assessment
- Reduce expensive cooling scap consumption to compensate suboptimal temperatures
- Minimize temperature delta of ladle temperature versus tapping melt temperature to reduce refractory lining deterioration



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