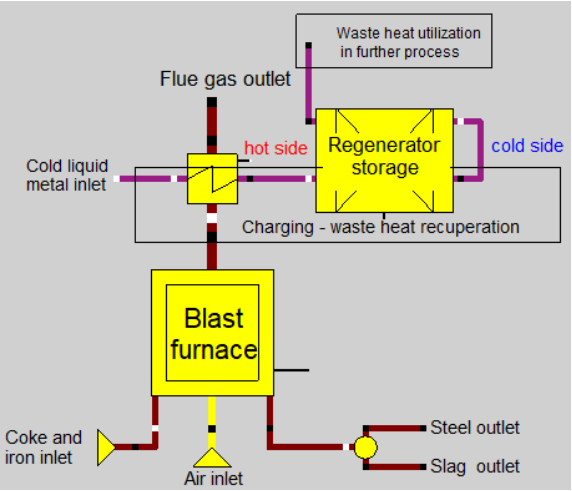
Karlsruher Institut für Technologie

Institute for Thermal Energy Technology and Safety

Investigation of a heat storage system with liquid metal as a heat transfer fluid using Ebsilon

Bachelor's/Master's Thesis (theoretical)
Start: from now on
Language: German/English
Chemical Engineering/Process Engineering, Mechanical Engineering

Background:
At the Karlsruhe Liquid Metal Laboratory (KALLA), the use of molten metals, also known as liquid metals, in high-temperature heat storage systems is being investigated both experimentally and numerically. In a previous work, a regenerator storage system was modeled and validated in Ebsilon® Professional using oil and salt as heat transfer fluids.
In this theoretical thesis, the component is now to be simulated in Ebsilon® using liquid metal as the heat transfer medium. The goal is to validate this storage system with liquid metal and then implement it in a real industrial process.



Example of the implementation of a heat storage system for waste heat recovery.

The following tasks are planned for this work:

- Literature review on the state of the art and research
- Familiarization with Ebsilon and the previous work
- Implementation of the liquid metal data into Ebsilon
- Validation of the storage system based on experimental data from KALLA
- If applicable, comparison with results from an existing Matlab tool
- Creating and simulating a model in Ebsilon based on a real application case (e.g., waste heat utilization in the steel industry)

A personal meeting to discuss the topic is possible at any time. The exact scope of the work can be adjusted to the individual interests of the candidate. For a bachelor's thesis, the scope will be reduced. The work can also be partially done from home.

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