TOWARDS THE STANDARDIZATION OF MOLTEN SALT LOOPS' INSTRUMENTATION AND COMPONENTS

TESIS test facility

(Thermal Energy Storage in Molten Salts)

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TESIS test facility

TESIS:com subplant

- Test and qualification of molten salt components for research and industry

- Investigation of unwanted operating events with molten salts (e.g. freezing processes)

TESIS:store subplant

- Demonstration of a single-tank thermocline storage system with filler materials
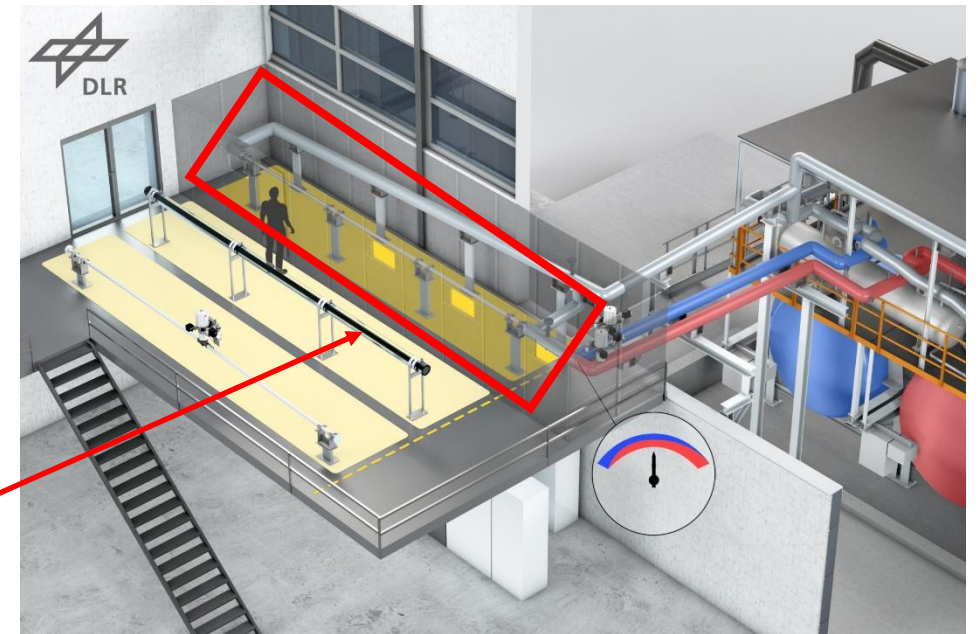
- Large component testing

The TESIS test facility in Cologne, Germany

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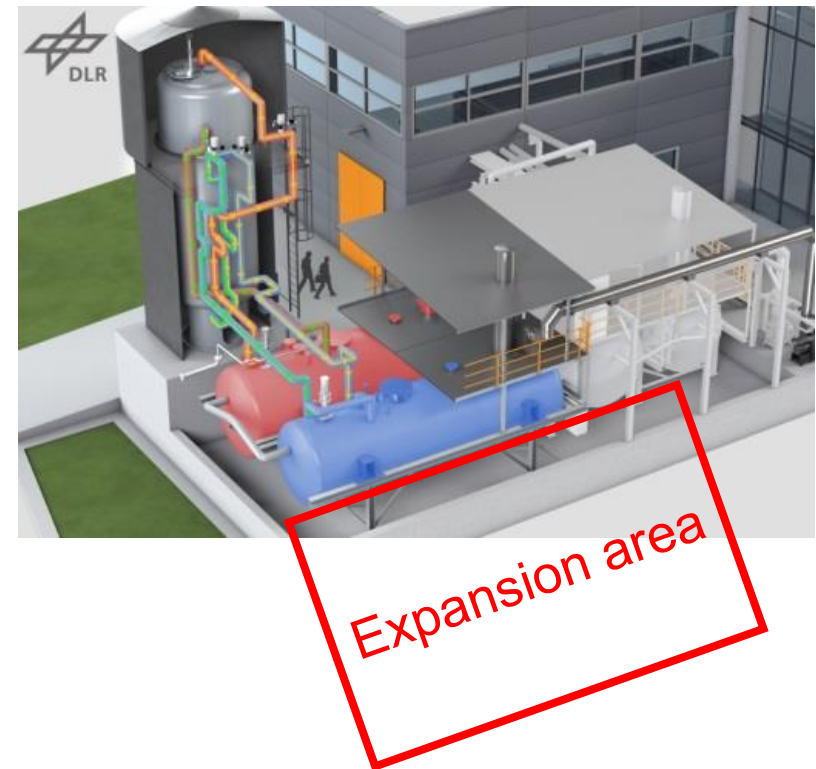# TESIS test facility

TESIS:com specifications

- Solar salt (60% $NaNO_3$ and 40% KNO_3)

- 290 °C - 560 °C inlet temperature

- 0.5 kg/s - 8.0 kg/s mass flow rate

- Mass flow and temperature ramps/shocks

- Required measurement and control equipment available on site

- Components installed in TESIS:com's test section

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TESIS:store specifications

- Similar specifications to TESIS:com

- Main research goal: Investigation of single-tank thermocline storage systems

- Expansion for large-component testing planned for 2024

- 60 bar pressurized air cycle will be available as a heat sink

Expansion area

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Examples of component tests #1

Flanges
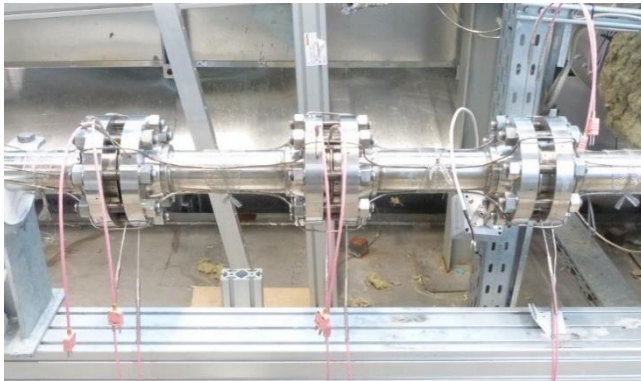
- Temperature ramps and shocks

Valves

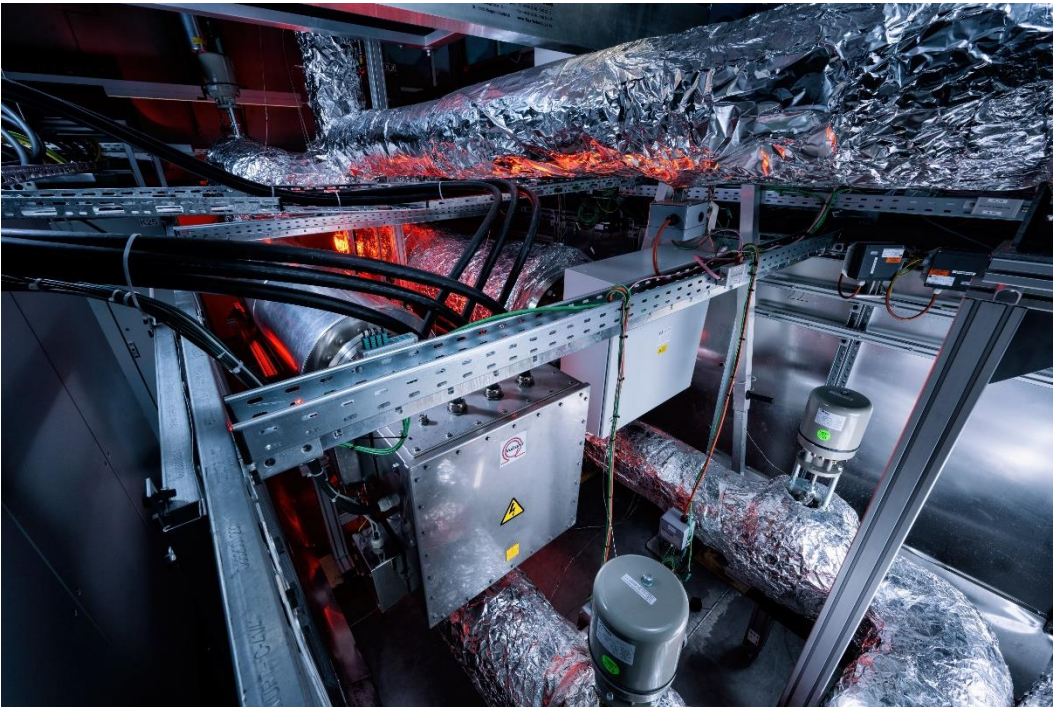- Open/Close cycles at variable temperature and flow

Flow meters

- Mass flow variation at different temperatures

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Examples of component tests #2

Electric heaters

- Two electric heaters with 360 kW_{el} each

- Test campaign with one heater successfully completed

  - 3 month of testing

  - Permanent exposition to molten salt at 500 – 560 °C

  - > 5000 On/Off cycles

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MOSAICO Project
Évora, 24th October 2023

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Examples of component tests #3

Salt-Air heat exchanger

- Component required for Malta's Pumped Thermal Energy Storage Concept

- Component tests conducted within the **Store2REPower** project