STORAGE RESEARCH INFRASTRUCTURE ECO-SYSTEM

RI Information sheet 2022

AIT Austrian Institute of Technology, ThermStore

Thermal Storages

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Project Acronym	StoRIES
Call	H2020-LC-GD-2020
Grant Agreement No.	101036910
Project Start Date	01-11-2021
Project End Date	31-10-2025
Duration	48 months

1. Photo

2. Geographical coordinates (˚, “, … N/S, E/W)

48° 16' 09.2"N 16°25'39.2"E

3. Description of the research infrastructure for the webpage

The **ThermStore** research laboratories at **AIT Austrian Institute of Technology** offer **characterisation methods** of thermal energy or heat storage technologies **from material to system scale**.

On material scale, e.g. for characterization of the **storage material**, **insulation** or **heat exchanger**, following research services can be offered:

Thermophysical properties (-180 °C to 1600 °C):

- Thermal conductivity $\lambda(T)$, Specific heat capacity $c_p(T)$, Thermal expansion $\Delta L(T)/L_0$, Thermal diffusivity $a(T)$, Density $\rho(T)$, Linear coefficient of thermal expansion CTE $\alpha(T)$

Thermal analysis (-180 °C to 1600 °C):

- Characteristic temperatures, Enthalpy determination, Mass change and evolved gas analysis

Viscosity and density of liquids (-60 °C to 135 °C)

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On **component and system scale**, Thermal Storages can be characterized up to **100 kW charging and discharging power** and **up to 350 °C**. Energy capacity as well as charging and discharging power profile can be measured. As heat transfer fluid thermal oil and (pressurized) hot water can be used. **Long-term storage material and heat exchanger tests can be performed** using a dedicated hot plate test set-up.

Simulation infrastructure is available (Dymola, Matlab, CFD, FEM) to analyse the storages in detail. In addition, **system integration** of storage into e.g. industrial site or district heating grid **can be analysed**.

Characterization of thermal storages (power, energy capacity, energy losses)

Characterization of heat exchangers (power, fluid flow)

Storage and component simulation

System simulation including different types of storage in different applications (buildings, industry, district heating grids etc.)

Training and Education

Standardization, Round-Robin-Tests

4. Availability of the research infrastructure

From today's perspective, the resources can be planned and used after consultation with the laboratory managers

5. Special considerations (confidentiality / NDA agreements, insurance requirement, special training, HSE training)

Confidentiality, insurance, and training depend on the resource needed for the user and are charged based on need

6. Energy storage technology that can be analysed/studied by using the research infrastructure

- Electrochemical ☐
- Chemical ☐
- Thermal ☒
- Mechanical ☐
- Superconducting Magnetic ☐

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- Cross-cutting ☐ (Specifically: …)

7. Key words for the webpage

Thermal Energy Storage, TES, PCM, TCM, specific heat, thermal conductivity, enthalpy, thermal expansion

8. TRL level (if applicable):

- 1-3 ☒
- 4-6 ☒
- Above ☒

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