Fraunhofer
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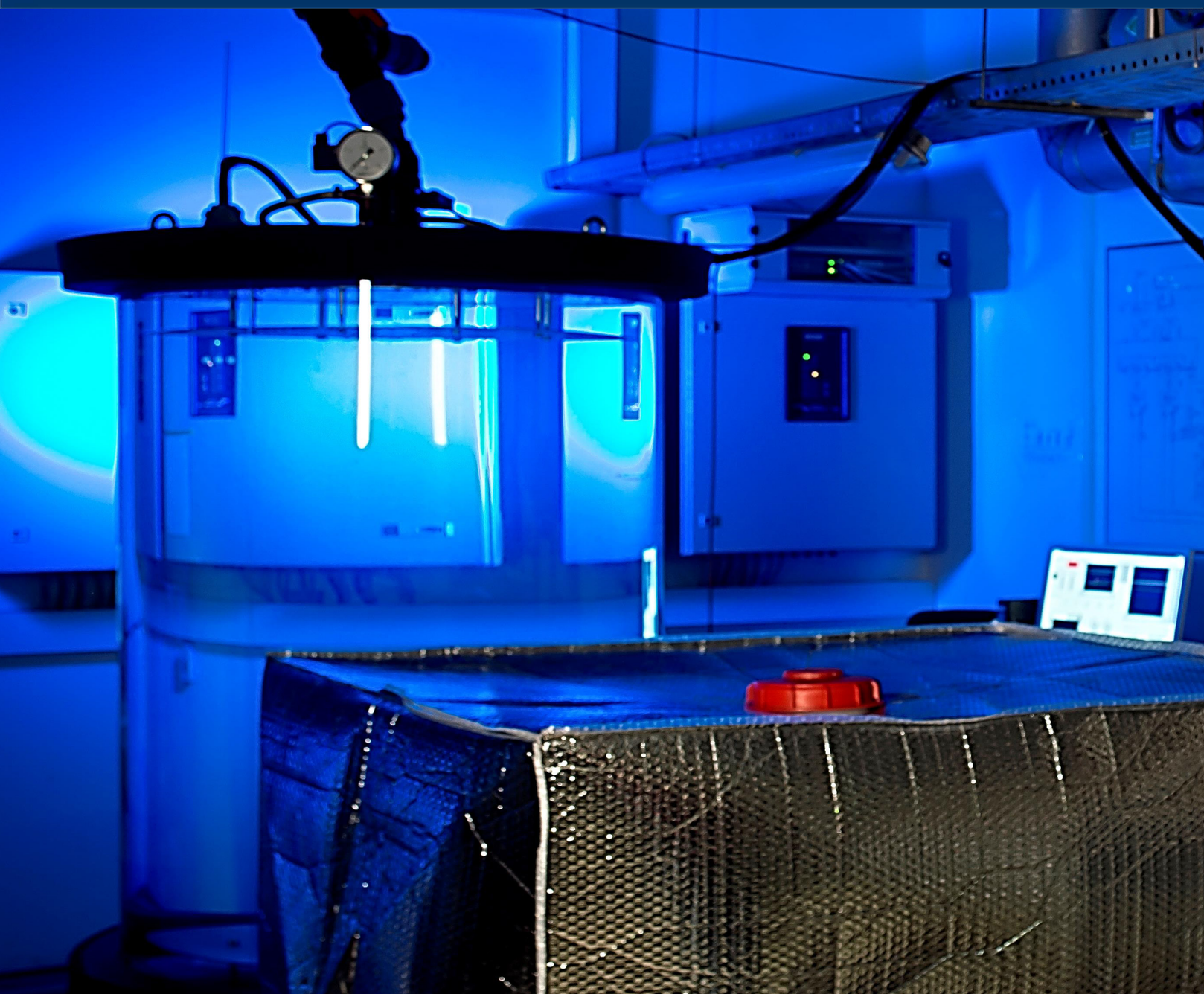
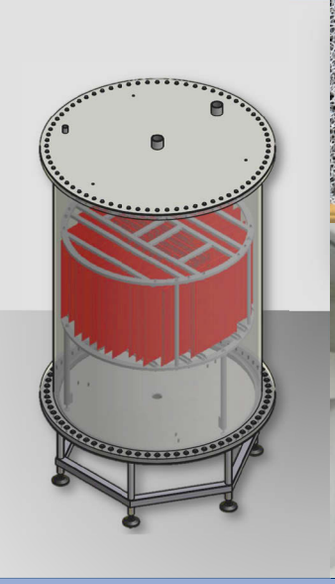
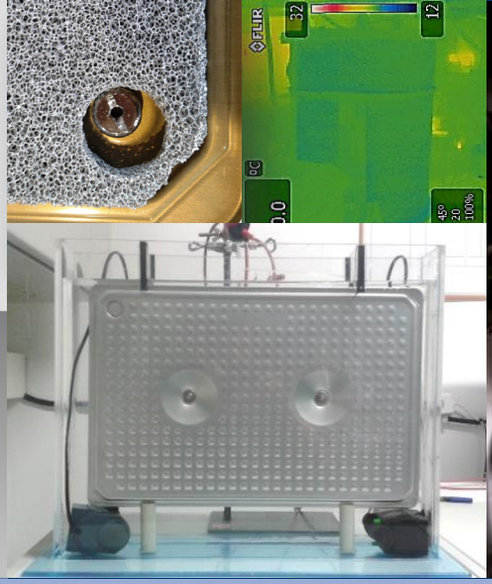
FRAUNHOFER INSTITUTE FOR INTEGRATED SYSTEMS AND DEVICE TECHNOLOGY

Thermal Energy Storage Technologies

Characterization, Simulation, Prototype Development







Description

The Fraunhofer IISB thermal energy storage research platform consists of a 1m³ tank and an extensive periphery that allows characterization of storage components under realistic conditions. Important research objects are for example stratification qualities of different loading systems or the thermal performances of phase change materials.

Besides characterization purposes, the facility is used to acquire data for simulation verification. The results can help to derive models for thermal losses in storage units and develop operation modes for storage units in a real environment.

Another main focus of our research is the design and improvement of loading systems, hydraulic integration, temperature measurements and PCMs like our phase change cooling elements with integrated metal foams for high specific power density.

For characterization services regarding thermal energy storage components please contact:

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Technical data of the demonstrator

Tank volume	1 m³
Cooling capacity (ΔT = 6K, water)	65 kW
Minimum volume flow	1 m³/h
Maximum volume flow	9,5 m³/h
Temperature range	7 to 30 °C
Storage technologies	Water, capsuled PCMs

Services and solutions

- Variable tank interior for characterization of different storage materials (e.g. phase change materials in capsules or plates)
- Development and characterization of storage technologies (e.g. charging and discharging systems, temperature measurement technologies, hydraulic circuits)
- Measurements with high temporal and spatial resolution (ranging from 1 second to several minutes and from millimeters to meters)
- Development of operating strategies for efficient utilization of storage capacities

Empirical stratification efficiencies of different inlet geometries