



MERITS

A RECHARGEABLE HEAT BATTERY

4TH MERITS NEWSLETTER - APRIL 2015

Dear sir/madam,

the past half year was full of interesting developments in the MERITS project on system, component, and material level. In addition to the scientific progress, demonstration of the MERITS system will follow shortly! A sneak-preview of the MERITS demonstrator along with other MERITS news can be found below.

Enjoy!

Sneak preview: MERITS demonstrator



Current MERITS developments are aimed at realizing a demonstrator, incorporating short term storage and long term storage for hot water generation and heating, and cooling. Solar energy will be harvested by solar collectors, and all functionality will be demonstrated in a real life dwelling mock-up.

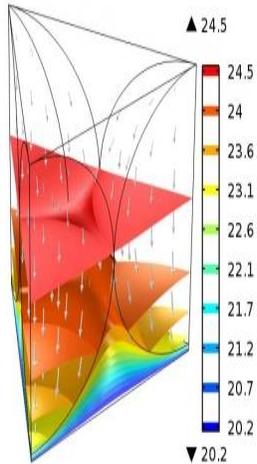
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PCM Sub-system potential

Phase-changing materials (PCM) offer the option to store thermal heat in a compact way by exploiting a change in a materials state. A common example of this is cold storage using ice where the heat required during the melting process of a given quantity of ice is sufficient to raise the temperature of the same amount of water by 80 degC. In contrast to a high change in temperature when using sensible heat storage, latent heat during a phase change does not implies a significant temperature change. Hence, the thermal energy can be stored with a high density while limiting the energy losses to the ambient.

[Read more](#)

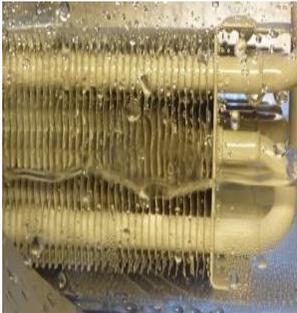
Modelling of TCM Reactor with COMSOL Multiphysics



Sorption heat exchangers (SHXs) are important components in sorption thermal storages, often build as fin-and-tube type heat exchangers with beds of TCM pellets. Also in MERITS, for the design and optimization of the SHXs the governing transport phenomena need to be quantified as functions of design parameters like geometry or material properties. In a contribution to the last Comsol Conference in Cambridge in September 2014 this issue was addressed. The heat transfer between fin surface and sorbent pellet was analyzed using a three-dimensional FEM model in the simulation software COMSOL Multiphysics(r).

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Evaporator/Condenser development



To supply steam for the sorption process of the thermochemical heat storage system, an effective and compact evaporator is required. On the other hand during desorption of the active material the same heat exchanger should take over the role of a condenser.

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Short-term storage



To de-couple energy demand from supply, a short term sensible storage vessel has been developed by Glen Dimplex in collaboration with other MERITS partners. The 300 Liter stainless steel store incorporates energy saving elements that have made Glen Dimplex market leader with its current hot water cylinder range.

[Read more](#)

We will be back at the end of the year with more inspiring results on heat battery development and testing achievements, as well as with the first demonstration results. In the meantime: check our website at www.merits.eu, or contact us with your questions or requests at info@merits.eu!

with best regards, the MERITS Team

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