

Annex 17

Advanced thermal energy storage through phase change materials and chemical reactions - feasibility studies and demonstration projects

Title of the project **Simulation Approach for Applicability of Phase Change Composites in Architectural Field**

Keywords (max 3 words) **phase change materials, thermal simulation, latent heat storage building elements**

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Institutions involved / Industry collaboration:

Type of project: (mark the appropriate)	Demonstration project
	feasibility study
	experimental work
x	simulation study
	other (specify):

Purpose (max 100 words)

prediction of building storage elements applicability.

Budget (including: governmental grant / industry collaboration / manwork / rental of room and utilities)

Summary (max 250 words, you may include pictures)

Thermal storage performance of the building elements made of phase change composites mainly paraffin or salt-hydrate absorbed in porous concrete is analyzed by simulation. A mathematical model describing the energy balance of phase change storage elements allows the operational simulation and also a prediction of building storage elements applicability. The numerical calculations in function of thermophysical properties, ambient and design parameters lead to the conclusion that solidification goes fully and the heat recharging process can be used only for the case of CaCl₂·6H₂O composite. The thermal simulation experience from this work would be used for prediction of the thermal performance and a choice of proper PCM composite elements for heating purposes in direct solar gain systems.

Economical evaluation

