

PCPlaster - Research Project Fact Sheet

Title of Project	Phase Change Material (PCM) enhanced plaster for upgrading the energy efficiency of contemporary and historic buildings - completed
Project Acronym	PCPlaster
Funding Program	M-ERANET
Project Identifier	M-ERA.NET 2012
Total Budget	240000 €
Starting – Ending Date	08/2014-08/2016
Consortium	<ol style="list-style-type: none"> 1. University of Cyprus, Coordinator (CY) 2. Frederick Research Center (CY) 3. Termokir Industries Ltd (IL)
Project Objectives	<ol style="list-style-type: none"> 1. The primary objective of the PCPLASTER project was the development of a novel, smart, cementless PCM-enhanced plaster with improved physical, chemical, mechanical and thermal properties, which would be appropriate for application in southern European climatic conditions. 2. A parametric study was adopted for the design and production of the PCM-enhanced plasters, in order to keep the mix designs to the absolute minimum number required. Various techniques were utilized for the addition of the PCM to the matrix (e.g. microencapsulation and addition using porous aggregates as carriers) in an effort to find the optimum solution. 3. The thermophysical (i.e. thermal conductivity and thermal storage capacity), hygric (i.e. capillary absorption, porosity etc), mechanical (i.e. compressive and flexural strength) and durability (i.e. resistance to salt crystallization) properties of the various plasters produced were tested in the laboratory, following EN and international standardized testing methodologies. 4. The most appropriate and better behaving laboratory-produced plasters were applied on various substrates (brick and stone) in-situ (pilot applications) and their performance/ efficiency (i.e. thermal and physico-mechanical properties) was monitored continuously through field measurements, in order to verify and/or normalise the numerical results. 5. A Life Cycle Analysis performance of selected PCM-enhanced plasters was conducted, while a feasibility study was carried out to determine whether the new product would be able to enter the market at a competitive level.
Work Packages	<p>WP1 Literature review, market survey and definition of PCM properties</p> <p>WP2 Design, lab production/testing and application of PCPLASTER</p> <p>WP 3 Computational analysis of PCMs and PCPLASTER thermal properties</p> <p>WP4 Life Cycle Assessment (LCA) of PCPLASTER</p> <p>WP 5 Project Dissemination and Exploitation of Results</p> <p>WP 6 Project Management</p>
External References	<p>https://doi.org/10.1016/j.jobe.2016.02.008</p> <p>https://doi.org/10.1007/s40243-015-0047-8</p>