



1 *Foamed polymer /  
structures with PCM.*

## FOAMED POLYMERS WITH PHASE CHANGE MATERIAL

### Fraunhofer Institute for Chemical Technology ICT

Joseph-von-Fraunhofer-Strasse 7  
76327 Pfinztal  
Germany

#### Contact

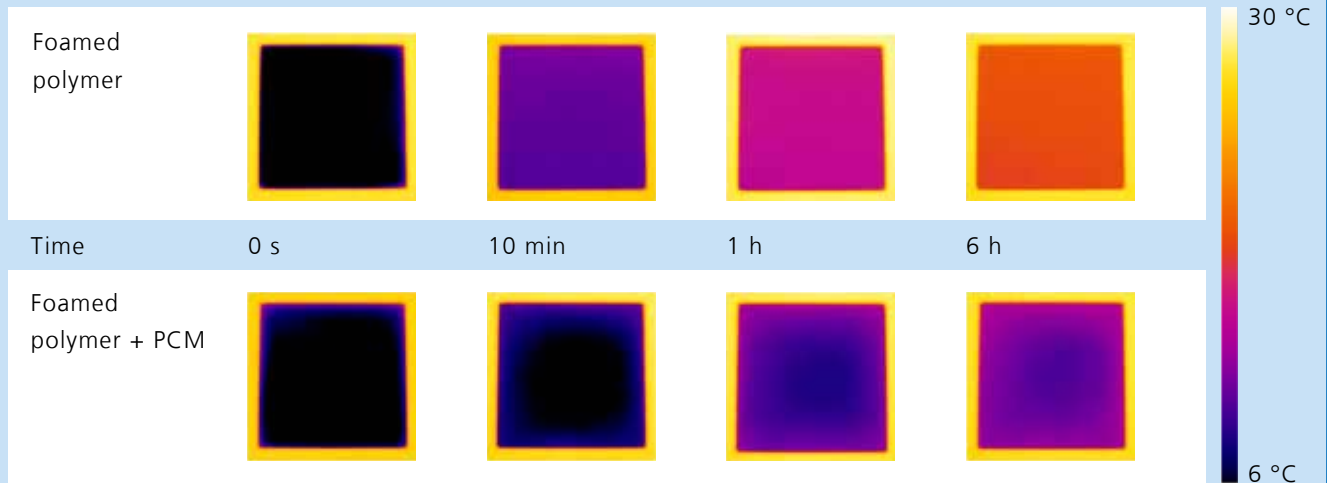
Dipl.-Ing. (FH) Sandra Pappert  
Phone +49 721 4640-469  
sandra.pappert@ict.fraunhofer.de

Christoph Mack  
Phone +49 721 4640-721  
christoph.mack@ict.fraunhofer.de

[www.ict.fraunhofer.de](http://www.ict.fraunhofer.de)

By combining foamed polymers with phase change materials (PCMs), the insulation properties of the foams are combined with the thermal properties of PCMs. PCMs have a high storage capacity in defined temperature ranges. They balance temperature fluctuations by absorbing and releasing heat depending on the ambient temperature. They consequently ensure an optimal, comfortable climate for people and technology.

To achieve this in specific applications, the major development step required is the integration of PCMs into components and systems. Through an established particle foam process, so-called steam chest molding, the thermal properties of the PCMs are combined with the insulating properties of foamed polymers. The heat flow in components consisting of these material combinations is significantly lower than in conventional foam structures.



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2 *Temperature behavior of a sheet made of foamed polymer and a sheet made of foamed polymer with PCM.*

### Our service offer

We offer our project partners and customers comprehensive system analysis for the combination of PCMs and particle foams, tailored to specific application conditions including material characterization and solution concepts for the incorporation of PCMs into particle foam components.

### Material

- Selection
- Characterization
- Kinetic evaluation
- Modification / functionalization of appropriate PCMs and particle foams

### System design

- Thermodynamic analysis
- Power dynamics
- Safety
  - fire protection
  - mechanical stress

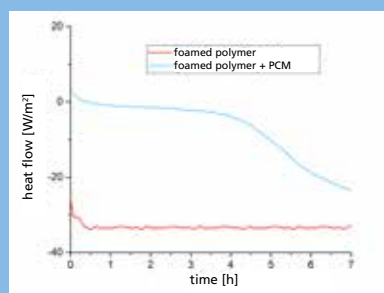
### System development

- Compatibility with various matrix materials
- Manufacturing parts for demonstrator components
- Economic evaluation

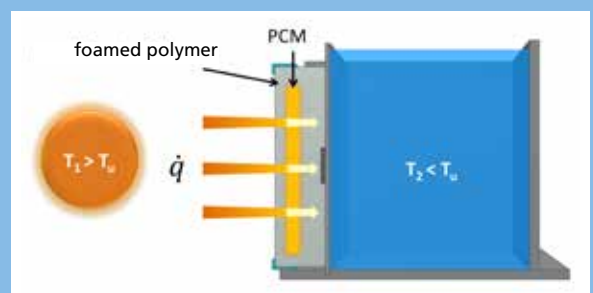
## Component development of foamed polymers with phase change materials (PCMs)



MATERIAL



SYSTEM DESIGN



SYSTEM DEVELOPMENT