



Joint press release
September 22, 2009

Team of Fraunhofer ISE and BASF nominated for the German Future Prize (Deutscher Zukunftspreis) 2009

On September 22, 2009, the Fraunhofer Institute for Solar Energy Systems ISE and BASF were nominated for the German Future Prize for the joint development of Micronal[®] PCM, a microencapsulated latent heat storage material for construction materials. This prize is awarded every year by the President of the Federal Republic of Germany. By awarding this prize for technology and innovation, the German President pays tribute to researchers and developers who, based on outstanding research work, successfully launch new products in the marketplace.

The basis for the innovative product developed by the three research scientists Prof. Dr. Volker Wittwer of Fraunhofer ISE, Dr. Ekkehard Jahns of BASF SE and Dr.-Ing. Peter Schossig of Fraunhofer ISE are so called phase change materials (PCM). The reason why these materials are so effective is due to a physical effect: During the transition from solid to liquid, PCMs absorb vast amounts of energy from their environment without heating up. This happens at a defined temperature range between 21° to 26°C. The absorbed heat is “hidden” inside the PCM or latent heat storage material (from Latin *latens* = hidden) and only released when there is a drop in the ambient temperature. Hence, PCM ensure that the temperature in living rooms, schools or offices never rises above or falls below comfortable levels in summer or winter, respectively. At best, it is even possible to do without air cooling units altogether during summer.

In order to utilize latent heat storage materials as a component for building materials, Volker Wittwer and Peter Schossig of Fraunhofer ISA came up with a clever idea. It consists of packing single drops of the storage material into tiny casings – experts refer to it as microencapsulation. Ekkehard Jahns of BASF developed the required technology and discovered ultrapure paraffin wax as a suitable latent heat storage material. The wax drops are encapsulated in small hollow spheres made of acrylic glass with a diameter of only a few micrometers. These microcapsules can be easily integrated into building materials such as mortar, plaster, and wood and are very robust: construction materials with Micronal[®] PCM can be processed as usual. Even drilling holes or driving in nails is not a problem. Due to their large overall surface area, the numerous storage microcapsules can swiftly exchange energy with their environment. Through the night-time release of the excessive heat that they absorb during the day, they reduce temperature fluctuations and create a balanced and comfortable indoor climate.

The research team of BASF and Fraunhofer ISE began developing latent heat storage materials for buildings in 1999. The PCM microcapsules of BASF have been used in various construction projects all over Europe and with great interest by builders and architects

worldwide. This is due to the fact that construction materials containing Micronal[®] PCM can, if they are an integrated part of the energy concept of buildings, replace traditional cooling systems completely or in part, without electricity and maintenance costs. In addition, their use leads to a sustainable reduction in carbon emissions.

Three project teams have been nominated for this prestigious prize. On December 2, 2009, Federal President Horst Köhler will announce the decision of the jury during the award ceremony to be broadcast by the German television channel ZDF. Further information and press photographs can be found on the Internet at www.deutscher-zukunftspreis.de

More information on Micronal[®] PCM is available at www.micronal.de



(From left to right) Dr. rer. nat. Ekkehard Jahns, Prof. Dr. rer. nat. Volker Wittwer, Dr.-Ing. Peter Schossig.
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About Fraunhofer ISE

With a staff of approximately 880, Fraunhofer ISE in Freiburg is the largest solar energy research institute in Europe. The work at the Institute ranges from the investigation of scientific and technological fundamentals for solar energy applications, through the development of prototypes, to the construction of demonstration systems. The work of the institute concentrates on energy-efficient and solar construction, photovoltaic systems, solar heat and hydrogen technology. A major focus is the consideration of existing energy-saving potential as well as the intelligent use of energies. In this context, conversion and storage techniques are playing an increasingly important role. Further information on the Fraunhofer ISE is available at www.ise.fraunhofer.de

About BASF

BASF is the world's leading chemical company: THE Chemical Company. Its portfolio ranges from chemicals, plastics and performance products to crop-protection products, fine chemicals as well as oil and gas. As a reliable partner BASF helps its customers in virtually all industries to be more successful. With its high-value products and intelligent solutions, BASF plays an important role in finding answers to global challenges such as climate protection, energy efficiency, nutrition and mobility. BASF posted sales of more than €62 billion in 2008 and had approximately 97,000 employees at the end of last year. BASF

shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN).
Further information on BASF is available on the Internet at www.basf.com.

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