

Bonn, 7 October 2014

## Storing thermal energy with vacuum and volcanic rock technology

Perlite powder in storage tank wall reduces heat losses

To increase the proportion of heat supply covered by solar thermal energy, greater efficiency is called for in storage tank technology. The BINE Projektinfo brochure “Vacuum tank stores heat” (14/2014) details the development of a storage tank with an enclosure that exhibits very low thermal conductivity. A vacuum between the inner and outer tank and a perlite powder filling in the cavity facilitate favourable insulating values.

The vacuum super-insulated hot water storage tank can store thermal energy over several weeks or months. The technology allows high solar shares of fraction in existing small and medium-sized buildings compliant with the low-energy house standard. The long-term heat storage tank is already used in several single-family homes and apartment buildings.

Minimising heat transfer between the inner and outer tanks produced from steel was the objective of the research project. To do so, the researchers created a vacuum in the annular cavity using simple pump technology. This made it possible to effectively inhibit air heat transfer. Thermal radiation, however, still occurs in vacuums. To reduce this effect, the researchers poured the poorly thermally conducting volcanic rock perlite into the cavity.

The vacuum super insulated hot water storage tank has been developed by Bayerisches Zentrum für Angewandte Energieforschung (ZAE Bayern) in cooperation with steel and metal engineering company Hummelsberger from Upper Bavaria.

The BINE-Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at [www.bine.info](http://www.bine.info) or by calling +49 (0)228 92379-0. The brochure cover and additional image material are also available on this web portal in the press section.

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