

University of Stuttgart gets a research house for solar heat storage

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Together with the company SchwörerHaus the Research and Test Centre for Solar Systems (TZS) of the Institute for Thermodynamics and Heat Technology (ITW) of the University of Stuttgart in the framework of the project "Solspaces" are developing a new heating concept in the building, combining the solar heating with the long-term heat storage.

The central element is a highly efficient thermochemical heat storage tank, enabling the solar heat from summer to be used to heat the building in the winter. After many years of developing, this concept is to be tested for the first time now in a residential house. For this purpose a new type of building of the type "Flying Spaces" from SchwörerHaus was supplied to the University of Stuttgart in Stuttgart-Vaihingen today in the early hours by means of a heavy transport.

"With the new research building at the University of Stuttgart we have the possibility of realising a [solar heating](#) system with which the [heat](#) requirements of a building can be covered throughout the entire year", the Head of the Research and Test Centre for Solar Systems at ITM, Dr Harald Drück and Project Leader Dr Henner Kerskes were pleased to say.

Whilst everybody is talking about solar energy in terms of electricity, the provision of heat is doomed to a shadowy existence. One reason for this lies in the fact that the heat generated on sunny days needs to be stored for cold periods. Up to now this has been done in water storage tanks requiring a great deal of space. The heating concept pursued in the project "Solspaces", in contrast, is based on a thermal solar system in connection with a sorption heat storage tank. This technology is characterised by energy density three to four times higher than water and enables a compact and almost loss-free [heat storage](#). Its centrepiece is a sorption storage tank made of highly porous zeolithen which is perfused with room exhaust air during the heating period and adsorped in the moisture contained in the air. This process releases heat that is used to heat the building. In summer the principle reverses: now heat is fed into the storage tank loaded with moisture in the form of hot air from solar collectors on the roof of the building. The hot air desorbs the storage material. The moisture entered into the storage tank in winter is hereby driven out and removed from the storage tank with the air flow. The storage material dried through this process is thus available again to heat

the building.

This technique will be implemented after the setting up work has finished in the research building on the site of ITW and will be experimentally tested. Initially there will be a detailed measurement based analysis of the building with the existing heating technology. Subsequently the newly developed solar heating system will be installed and likewise analysed based on measurements so that the advantages resulting from this system are able to be directly quantified. The project SolSpaces is being funded by the Federal Ministry of the Environment (BMU) with 650,000 Euros for three years.

Flexible building concept

The "Flying Spaces" of SchwörerHaus were selected for the tests since this type of building makes the greatest demands on the compactness and integration of the [heating system](#) due to its dimensions and on the other hand shows a specific heating requirement due to its ratio of volumes to surface, which could possibly be transferrable to larger buildings with a worse heat insulation standard. The flexible residential buildings, up to 48 square metres in size, which are completely premanufactured, built and delivered by truck can already be purchased today with a conventional heat supply. Based on the basic idea of a flexible and at the same time more or less self-sufficient residential and [building](#) concept, a both innovative as well as future-oriented heating concept is now to be developed enabling integrated and completely regenerative heating requirements cover.

Provided by University of Stuttgart

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