

Project no. 338-041

Full-scale demonstration of thermal active building system – Phase 3

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Based on a DTU pilot project, the new head office of Middelfart Sparekasse (bank), 4 900 m² in area, is planning to use thermoactive structures. Its objective is to reduce electricity consumption for cooling and ventilation by 80 %, thereby making it easier for new industrial construction work to comply with the more stringent energy requirements.

Anticipated final project results:

Following commissioning of construction work, the project will undertake measurements and carry out indoor climate satisfaction tests. The results of the first year of building operations are expected to be ready in spring 2011.

It is anticipated that it will be possible to document significant energy savings using this technology. Electricity consumption for cooling will be reduced by 75-80 % from 10 kWh/m²/year, and electricity consumption for ventilation will be reduced by approx. 80 % from a standard consumption of approx. 11 kWh/m²/year: overall, permitting savings of around 16.5 kWh/m²/year.

The design is evaluated and fully developed so that production, hoses, installation and assembly methods are optimised as far as possible and the technology is commercialised and ready for use in the field of element construction.

The primary objective is to demonstrate the actual principle of thermoactive structures: the thermoactive element involves actively influencing the actual structure with an integrated system which cools the building using, for example, groundwater or seawater, using nothing other than a circulation pump. During the night, this cooling water, which is typically at 19 degrees Celsius, removes the “excess temperature”, as it is known, which the structure has amassed over the course of the day. And because the hoses are laid deep down in the floor - and the water is nevertheless not colder - cooling will not have a significant effect on the floor above. The thermal hole cover can also be used for heating. The advantage is that the water only has to be heated to 30 degrees, compared with approx. 60 degrees in radiator systems, although these can be used for supplementary heating.