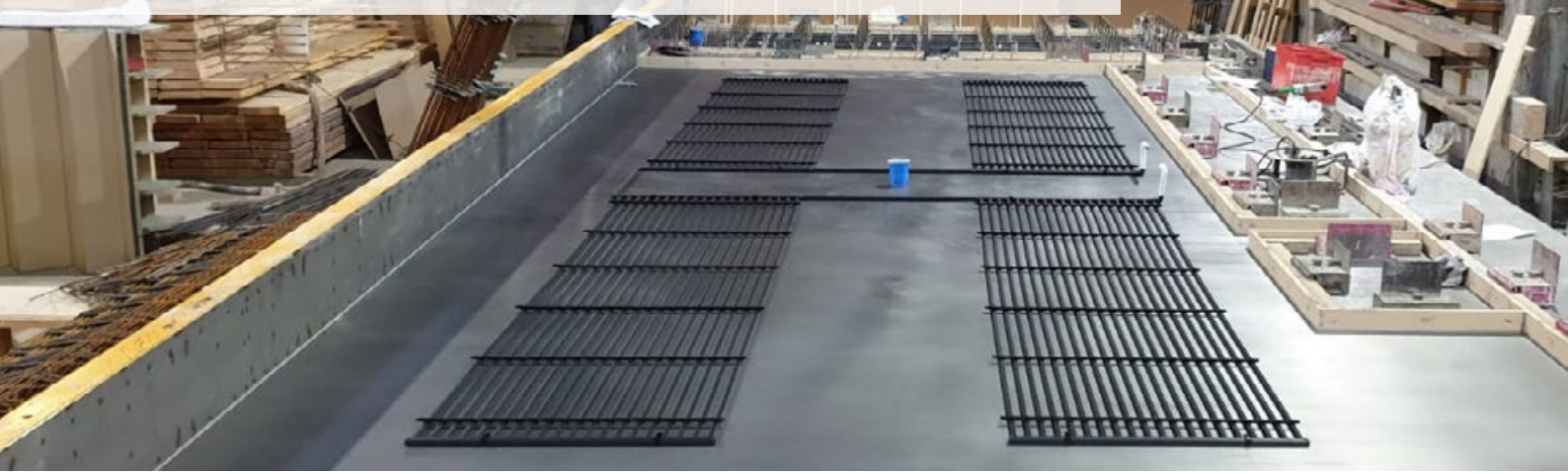




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## CASE STUDY: COST-SAVING ROOM TEMPERATURE CONTROL AND LITTLE INSTALLATION EFFORT



**PROJECT:**  
Office building Zuber Beton GmbH

**LOCATION:**  
Crailsheim, Germany

**COMPLETION:**  
2020

**APPLICATION:**  
Surface heating and cooling

**PRODUCT:**  
aquatherm black system

### THE CHALLENGE

For their new office building, Zuber Beton GmbH was looking for a reliable heating and cooling system that can be quickly and easily installed in thermally active ceiling panels and that saves energy.

### THE SOLUTION

aquatherm black system was selected due to the very low installation effort in the concrete plant and excellent heating/cooling performance.

## ZUBER BETON GMBH RELIES ON THERMALLY ACTIVE CEILING PANELS WITH THE AQUATHERM BLACK SYSTEM

**H**eating and cooling via components such as ceilings is becoming increasingly important in office and industrial buildings. Thermally active ceiling panels are a good option due to their diverse advantages, which range from cost-saving and pleasant room temperature control to universal application options and short installation times. Zuber Beton GmbH also knows this and has decided to use aquatherm black system in its ceiling panels as part of the new construction of its office building.

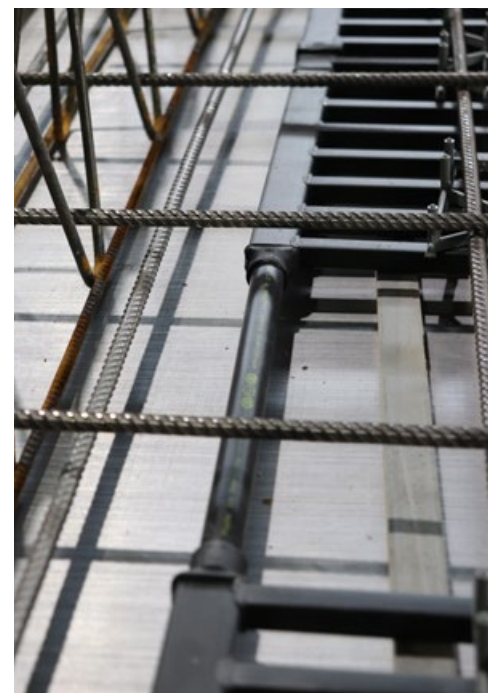
Zuber Beton GmbH from Crailsheim is part of Zuber Holding GmbH, which also includes two planning offices and a logistics company. The specialist for architectural concrete, concrete facades, exposed concrete and exposed concrete stairs is currently building an office building with a gross area of around 1,500 square metres at the company location in Crailsheim, which should contain as well rooms for planner/architect meetings and exhibitions.

*“Zuber is an innovation-driven company, which is why we rely on innovative systems in our own construction project,” explains graduate engineer Laurenz Zuber, managing director of Zuber Beton GmbH.*

In the area of heating and cooling, the company opted for the near-surface activation of the building’s ceiling by an aquatherm black system in a prefabricated concrete ceiling. The aquatherm black system grids, made of the corrosion-resistant material polypropylene, were installed on a ceiling area of around 930 square metres at a distance of approximately 1.5 centimetres above the bottom edge of the concrete.

*“Due to the low concrete coverage, we achieve a high heating/cooling capacity,” says Zuber.*

Installation in the ceiling offers systemic advantages, especially for passive cooling: Unlike conventional air conditioning systems, which remove the heat from the room with the help of air exchange, cooling ceilings dissipate the cooling load from the room mainly by means of radiation. Drafts are eliminated by this process. During heating, the heat transfer takes place almost exclusively through heat radiation – the effect is a high level of comfort for the user and an even heat distribution throughout the room.







## TIME SAVING THROUGH TAILOR-MADE PRODUCTION

The new building is a KfW Efficiency House 55 with an annual primary energy requirement of 33 kWh/m<sup>2</sup>a and an annual heating requirement of 34.63 kWh/m<sup>2</sup>a. The energy demand calculation, which was carried out by the engineering firm IFT Zuber GmbH, was the basis for the technical design, which was developed by aquatherm. Based on the floor plan and filigree ceiling plans, the grids were planned in detail for each filigree ceiling element. Individual zones were taken into account for individual room control in accordance with the Energy Saving Ordinance. The grids were then manufactured precisely in the aquatherm factory.

*Says Zuber: “aquatherm black system convinced us because we were able to achieve very little installation work in the concrete plant. The grids were inserted directly into the formwork for the individual precast elements, connected to each other and compressed with air before the concrete was let in to check for leaks. Later at the construction site, the individual prefabricated ceiling elements only had to be connected to each other.”*

The system is powered by an air-water heat pump with low flow temperatures – perfect conditions for the heating/cooling system from aquatherm. The raw ceiling is designed as a exposed concrete ceiling. Thanks to the modular structure of the aquatherm black system grids, the grids could be attached to the lower reinforcement, so that there are no visible contact points on the underside of

the prefabricated ceiling due to spacers. Accordingly, no further processing of the ceiling is necessary after installation on the construction site.

*“We are thrilled with the responsive system with which we can heat and cool our office building cost-effectively,” concludes the managing director of Zuber Beton GmbH.*



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