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References

Single-family home

Uponor involvement

300

Single-family home

The TABS PE-DIR 40 concrete core activation system from Uponor provides efficient, draught-free cooling for a single-family home in Stettfurt.

Project Facts:

Completion
2011

Address
Weinbergstrasse

Project Type
New building

Partners

specifier
Meierhans + Partner AG
Switzerland

The TABS PE-DIR 40 concrete core activation system from Uponor provides efficient, draught-free cooling for a single-family home in Stettfurt, Germany, a town located in the Canton of Thurgau.

This two-storey house, which is built on a hillside, is heated and cooled using only geothermal energy. A ground source heat pump generates heating and cooling energy throughout the year. This energy is then transferred to an Uponor Thermally Active Building System (TABS) installed in the building's floors and ceilings. Using this system, the 300 m² of living space are provided with efficient, draught-free heating and cooling. Meierhans + Partner AG, the planning agency involved in this project, was impressed by the product solution and additional services provided by Uponor.

The Uponor TABS (type PE-DIR 40) is used to thermally activate around 600 m² of concrete. To make this possible, 3,500 metres of Uponor composite pipe were laid in the concrete ceilings, floors and walls of the building. Water flows through the pipes, transferring heating or cooling energy to the concrete, which is thermally activated in the process. During the cooler months, heating energy is transferred to the concrete, which in turn heats the room. To cool the building during the warmer months of the year, the concrete absorbs the heating energy in the room and transfers this energy to the water in the pipes.

The goal was to thermally activate as much of the building's surface area as possible. This way, Uponor TABS can efficiently heat the building with a low flow temperature of 29°C and a return flow temperature of 25°C. This reduces the energy needs of the building and saves on operating costs. It was possible dispense with a thermostat, as the operating temperature always remains under 30°C. Instead, the building has been equipped with a weather compensating climate controller. This way, Uponor TABS is able to cover the building's heating and cooling needs of around 20 W/m² each. As a result, the building owner does not have to invest in additional heating systems. In addition, the Uponor TABS PE-DIR 40 offered some impressive advantages in terms of installation. The composite pipes (16 mm x 2 mm) are pre-mounted as standard to steel support elements. The specifications of the TABS elements with regard to element surface area, pipe dimensions and installation spacing were adjusted to suit the requirements of the property. The TABS elements were supplied with the corresponding connection cables pre-adjusted to the appropriate length. This way, couplings did not have to be installed in the concrete. Construction time was therefore dramatically reduced, as many of the required elements were prepared prior to installation.

The composite pipe installed by Uponor in this project combines the advantages of plastic piping with those of metal piping. The composite pipe is oxygen-tight, guarantees high form stability and is flexible enough to bend. In addition, it is corrosion-resistant and offers exceptional thermal expansion properties.

The prefabricated TABS elements were mounted on the lower layer of the concrete reinforcement and then fixed in cement. During the installation, it is possible to walk on the elements. A PE spacer sleeve from Uponor always ensures that the required distance is maintained between the water pipes and the concrete reinforcement. To thermally activate the concrete surfaces of the roof, the technicians also attached steel support elements to the upper and lower reinforcement layers. Thanks to the use of prefabricated materials, it was possible to install the concrete core activation system with only two installers working over three days.

Single-family home



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