

Cooling water tanks made of cross-ribbed SIMONA® Twin-Wall Sheets pave the way for innovative energy concepts



Top: ready-assembled 100 m³ cooling water tank made of cross-ribbed SIMONA® PE 100 black Twin-Wall Sheets; bottom left: plastic tank with a bolted steel frame made of galvanised steel IPE sections; bottom right: cross-ribbed SIMONA® PE 100 black Twin-Wall Sheet

In Ingolstadt a state-of-the-art technology park called incampus was opened on a rehabilitated refinery site covering 75 hectares. As a zero-energy campus, this high-tech park is designed to generate just as much energy in future as it consumes. This innovative energy concept is to be realised with a water-based piping network, the so-called LowEx network. One integral part is a 100 m³ cooling water tank made of cross-ribbed SIMONA® PE 100 black Twin-Wall Sheets.

The project at a glance

Project

Development and construction of a cooling water tank with a storage capacity of 2 x 50 m³, made of cross-ribbed SIMONA® PE 100 black Twin-Wall Sheets

Requirements

- Plastic tanks made of PE 100 (storage capacity 2 x 50 m³)
- Service pressure: pressureless
- Medium: water
- Calculation and sizing for a service life of at least 25 years, based on DVS Information Sheet 2205 with structural proof
- To be installed and welded on site

Client

Karl Lausser GmbH, Rattiszell, Germany, on behalf of STRABAG AG, Cologne, Germany

Contractor

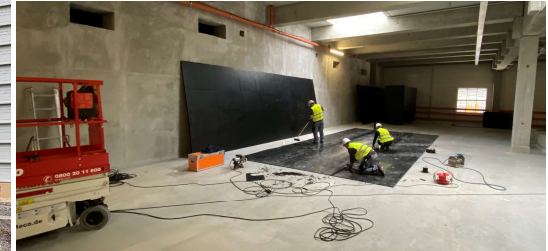
Hopfgartner Kunststoff- & Umwelttechnik GmbH, Ilmendorf, Germany

Products used

- Cross-ribbed SIMONA® PE 100 black Twin-Wall Sheets, 2,000 x 1,000 x 40 mm (for the tank walls)
- SIMONA® PE 100 black sheets in thicknesses of 25 mm (partition) and 15 mm (tank bottom)

Duration of project

2 months



From left to right: transporting the individual components of the 100 m³ plastic tank to the incampus energy centre; a telehandler placing the front wall in the incampus energy centre; erection, assembly and welding of the individual components on site

SIMONA® Twin-Wall Sheets – light, sturdy, durable

Initial situation

In 2015, IN-Campus GmbH, a joint venture between AUDI AG and the City of Ingolstadt, acquired 75 hectares of land that had previously belonged to the former Bayernoil oil refinery in the south-east of Ingolstadt. This is the site of incampus, a high-tech park for innovative technology projects in the automotive sector. The construction of incampus was preceded by one of the largest soil remediation projects in Germany. The soil and groundwater had to be cleaned up by removing hundreds of tonnes of heavy oil, petrol and carcinogenic chemicals. However, incampus is setting standards not only in terms of future-oriented mobility and environmentally friendly remediation. At present, the buildings are still being supplied with electricity and district heating from external sources. In the medium term, however, the aim is to achieve a zero-energy campus that uses self-generated and regenerative forms of energy.

Task

To come a step closer to this vision, a so-called LowEx network (i.e. a low-exergy network) is being installed. Buildings with a high cooling load (e.g. the computer centre) emit waste heat into the network. Thus, buildings with a high heating load have the required energy available from the LowEx network. Based on this concept, consumers become producers. For this purpose, it is necessary to have a water-based piping network with hot and cold water tanks serving all the buildings on the incampus as a heat source and heat sink. To meet the requirements of the tender for construction of the two 50 m³ tanks, the company carrying out the work, Hopfgartner Kunststoff- & Umwelttechnik GmbH, was looking for cross-ribbed Twin-Wall Sheets made of PE 100 with a module size of 50 x 50 mm. The individual components had to be planned by Hopfgartner in such a way that it would be possible to place them in the building and assemble them by on-site welding.

Solution

Hopfgartner decided in favour of cross-ribbed SIMONA® Twin-Wall Sheets made of PE 100 black, which, in addition to their design-specific benefits, also proved to be a convincing option because of the corrosion resistance, media resistance, durability and recyclability of the material. Owing to the cross-ribbed internal structure of the Twin-Wall Sheets, a high level of direction-independent rigidity is achieved, despite a wall thickness of only 40 mm. The additional reinforcement with a bolted steel frame made of galvanised steel IPE sections provides the basis for a sturdy and long-lasting tank design without any temperature-related linear expansion. Moreover, on account of the cavities, the sheets have good thermal insulation properties and by comparison with solid material they are lighter, as a result of which transport and on-site delivery of the prefabricated components with dimensions of up to a total length of 7,000 mm and a total width of 2,800 mm proved to be particularly efficient, without the need for any special haulage operations. Inside the incampus energy centre the individual components were then assembled on the spot in the proper manner by means of heated-tool butt welding and hot-gas extrusion welding.

SIMONA® Twin-Wall Sheets

Properties

- High rigidity and strength
- Good thermal insulation properties
- High fracture resistance
- Corrosion-free
- Rectangular tanks possible without steel reinforcement
- Lighter weight than with solid material enables prefabrication and easy transport

Fields of application

- Tank and plant construction
- Gas and waste air scrubbers
- Swimming pool construction

Product range

- Cross-ribbed Twin-Wall Sheets made of SIMONA® PE 100 black, SIMONA® PE 100 UV white SIMONA® PP-C and SIMONA® PPs, 2,000 x 1,000 x 40 mm
- Longitudinally ribbed Twin-Wall Sheets made of SIMONA® PE 100 black, SIMONA® PP-H AlphaPlus® and SIMONA® PPs, 3,000 x 1,000 x 54 and 58 mm
- Corner elements, 45° and 90°
- Flat connections

Further information

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