CASE STUDY

GEOTHERMAL HEATING PLANT

Climate-friendly energy generation thanks to medium-depth geothermal energy

Photo: Stadtwerke Schwerin

aquatherm®

Part of the Solution
www.aquatherm.de

PROJECT:
Geothermal heating plant

LOCATION:
Schwerin, Germany

COMPLETION:
2023

APPLICATION:
Geothermal

PRODUCT:
aquatherm blue

THE CHALLENGE:

Due to the high mineralisation of the extracted thermal water, a corrosion-resistant piping system was needed for the piping in the machine house of the geothermal heating plant. In addition, for geochemical reasons, a permanent overpressure must be maintained in the piping system used - and this at temperatures in the range of 50/70 °C.

THE SOLUTION:

aquatherm blue made of the plastic polypropylene is an ideal solution under the conditions encountered.

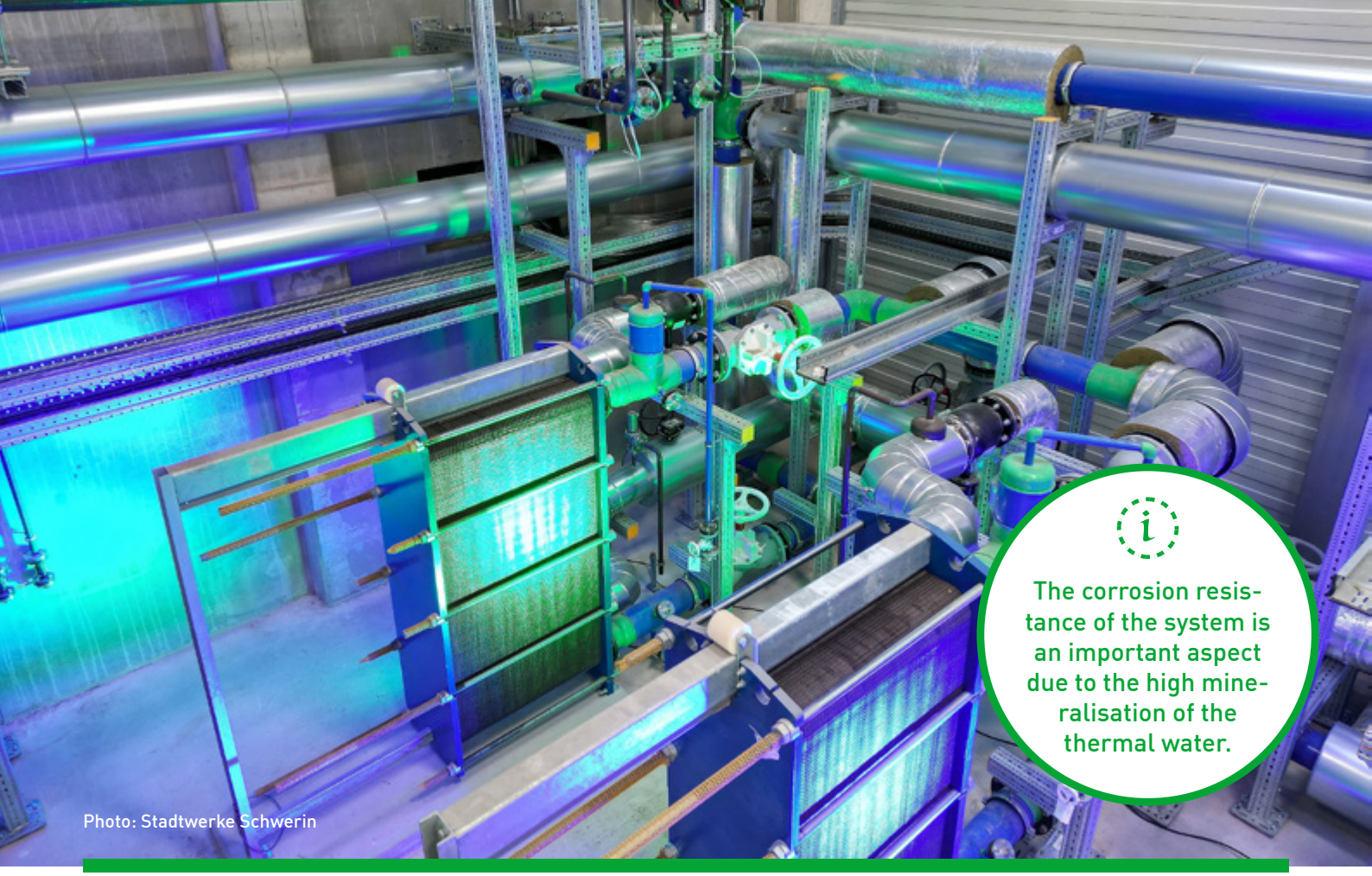

Photo: Stadtwerke Schwerin

The corrosion resistance of the system is an important aspect due to the high mineralisation of the thermal water.

UNIQUE IN GERMANY - AQUATHERM PIPELINES PART OF THE PROJECT

A groundbreaking project has been launched in Schwerin: Stadtwerke Schwerin has put its first geothermal plant into operation. The plant, which is the only one of its kind in Germany so far, combines medium-depth geothermal energy and heat pumps and has a special relevance: In the future, 15 percent of the district heating in Schwerin will be generated in a climate-friendly way by using the renewable energy. Piping systems from aquatherm are part of the project.

Geothermal energy is an inexhaustible source that can be extracted all year round, regardless of climate or season. Stadtwerke Schwerin has a well-developed district heating network in the city. Therefore, the use of geothermal energy is a consistent step towards sustainable and climate-friendly energy production.

The geological conditions at the site in Schwerin-Lankow are particularly favourable for the operation of the plant. At a depth of about 1,300 metres, there is water with a temperature of about 56 degrees Celsius, brine to be precise, with a salt content of 15 per cent. For heat generation, this water is brought to the surface with the help of a powerful pump. The geothermal energy is then extracted through heat exchangers and, in a first step, heated to around 80 degrees Celsius by four heat pumps.

Depending on the outside temperature, the water temperature is only increased again if necessary and then fed into the district heating network. The cooled thermal water is fed back into the same rock layer via an injection pipe, creating a closed circuit.

The entire piping in the machine house of the geothermal heating plant, including the connection to the heat pumps, was carried out with aquatherm blue in dimensions up to 200 mm in diameter. In this case, the installation of this plastic pipe system from aquatherm offers several advantages compared to other systems. „Thermal waters, such as those produced in the North German basin, place special demands on the piping material," explains Dr.-Ing. Frank Kabus, Managing Director of Geothermie Neubrandenburg GmbH as the consulting and planning office for the project. „Due to the high mineralisation of up to 300 g/l, the corrosion resistance of the material is of course an essential aspect. Furthermore, for geochemical reasons, a permanent overpressure of several bar must be maintained in the pipe system - and that at temperatures in the range of 50/70 °C. aquatherm blue made of the plastic polypropylene is an ideal solution under the conditions encountered. Oxygen access to the thermal water, normally a disadvantage of plastic compared to metallic pipes,

Photo: Stadtwerke Schwerin

The entire piping in the machine house of the geothermal heating plant, including the connection to the heat pumps, was carried out with aquatherm blue.

can be prevented in this case by integrating a diffusion barrier. This is essential because otherwise particle formation can occur in the thermal water, which creates injection problems in the underground over time."

Dr Kabus sees another advantage in the processing of the system: „Since the pipes are joined by welding, there are no weak points such as gluing. Especially with buried pipelines and the fact that the thermal water has a water hazard class, this advantage cannot be dismissed."

aquatherm®

aquatherm GmbH | Biggen 5
57439 Attendorn | Deutschland

Tel: **+49 2722 950 0**
Mail: **info@aquatherm.de**