

ENGINEERING
TOMORROW

Danfoss

Case study | Heat exchangers

Danfoss ensures a smoother operation for a purification plant in Italy

eco center AG has replaced its current shell-and-tube technology with spiral heat exchangers from Danfoss. Clogging and weekly cleaning of the heat exchangers is now history - with a return of investment in just one year.



Tailor-made spiral configuration to ensure a smooth operation for an Italian purification plant

Since eco center AG replaced its current shell-and-tube technology with spiral heat exchangers from Danfoss, clogging and weekly cleaning of the heat exchangers is now history - with a return of investment in just one year.

In 2020, Danfoss supplied two spiral heat exchangers to the purification plant eco center AG, a society of the municipalities of South Tyrol and the Autonomous Province of Bolzano, Italy.

The company operates the most important waste disposal facilities (including wastewater service sewerage and wastewater treatment) and supports environmental research projects to investigate the impact of its activities in the surrounding area.

Description of the project

The recuperator (tubular heat exchanger) needed to be replaced with another type of heat exchanger due to frequent clogging.

The clogging occurred 1-2 times per week, and the plant had to stop the entire process to clean the shell-and-tube heat exchangers.

- The quality of the industrial wastewater quality is variable throughout the year and even weekly
- Suspended solids in the wastewater (up to 1,500 mg/liter)
- The plant needs to heat a large amount of wastewater (flow rate is 145 m³/h) at a consistent temperature of 23.2°C

eco center AG requested the following:

- Maintain 1.400 kW and 150 m³/h
- Avoid clogging issues
- Advanced control and modularity
- Ensure installation in an accessible location

Our Solution

Danfoss offered a tailor-made spiral configuration manufactured with

- Easy opening hinged covers
- CIP joints on connections for cleaning without opening
- Separate drain connections

The replacement with the Danfoss spiral heat exchangers includes a high-channel design and extra length to ensure less cleaning (compared to the former shell-and-tube technology that needed cleaning 1-2 times per week).

Advantages

- The best compromise between efficiency and functionality
- Adequate free flow of suspended solids
- Modularity (during maintenance, the second heat exchanger operates half power)
- Easy to check and clean automatically.



Since the commissioning of the Danfoss spiral heat exchangers, we have had zero cleaning compared to the previous S&T technology, where the equipment were cleaned 1-2 times per week. This is an outstanding result!

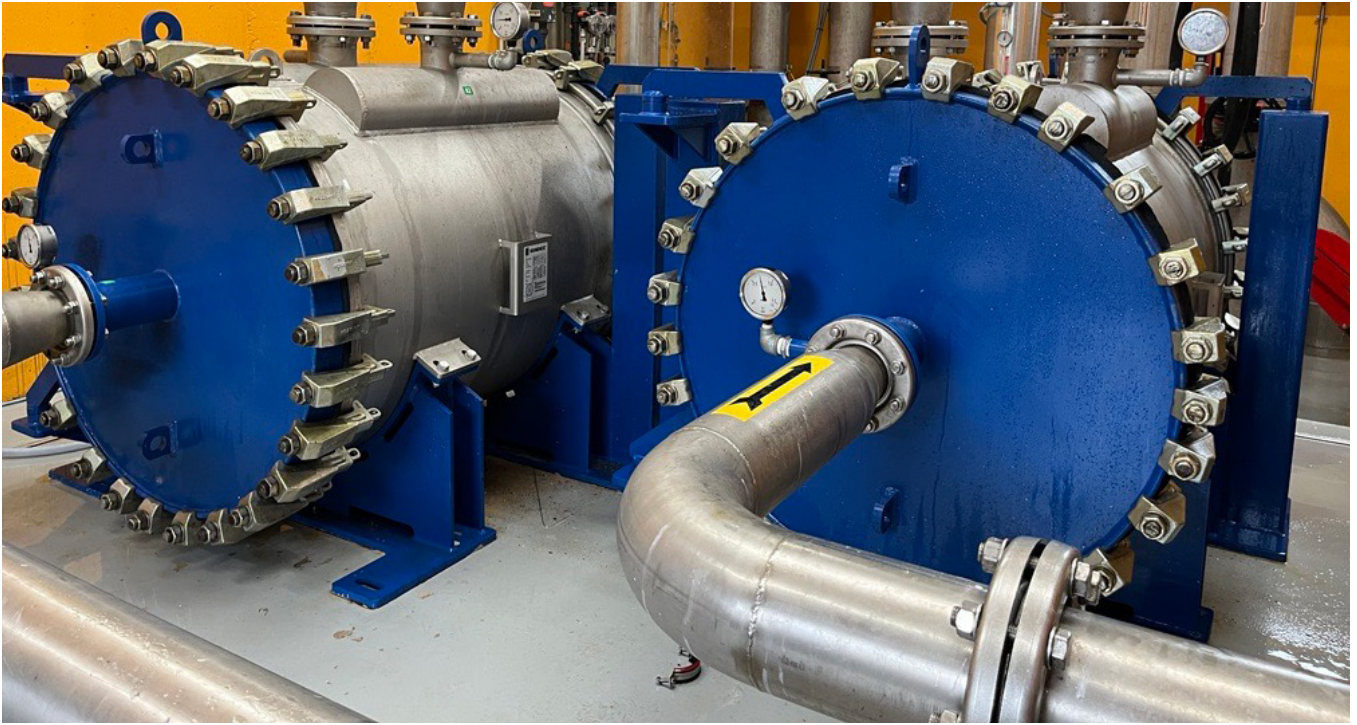
Hans Peter Pedron
Head of Purification Department
eco center AG, Bolzano, Italy



How Danfoss has helped eco center with purification of waste water

Danfoss Heat Exchangers delivered the following products to eco center:

- 2 pcs. spiral heat exchangers 1250D1000
- Application: Recuperator/preheater (recovery line)
- Media: Sludge / Sludge
- Heat load: 715 kW
- Temperature:
Side 1: 36.0°C ->27.8°C
Side 2: 15.0°C ->23.2°C



Danfoss spiral heat exchangers offers a wide range of benefits

- Single-channel design that generates high shear rates which contribute to a self-cleaning effect, preventing clogging of the unit. Spiral heat exchangers are the perfect solution for challenging, high-viscosity media.
- Very compact solutions, our spiral heat exchangers have minimal space requirements. Despite their small stature, the long, curved flow paths allow for very high heat transfer coefficients up to twice as high as their shell and tube counterparts.
- Limited need for maintenance and cleaning ensures extended operational uptime. If the need for cleaning arises due to particularly difficult media, the hinged covers provide easy access to the entire heat transfer surface.

This enables eco center to operate at full capacity without losing valuable production downtime due to frequent cleaning and maintenance.



Clogged turbular heat exchanger that requires cleaning.



New/cleaned turbular heat exchanger.



Danfoss Heat Exchangers is happy to take part in this exciting project and to engineer this great solution for the eco center water treatment plant. This great achievement resulted in return on investment in less than 1 year.

Mirko Pogliani
Sales Manager, Danfoss Italy



Want to learn more about the best-in-class plate heat exchangers?

At Danfoss, we help professionals all over the world **reduce energy consumption** and **increase heating efficiency** with our wide range of plate heat exchangers.

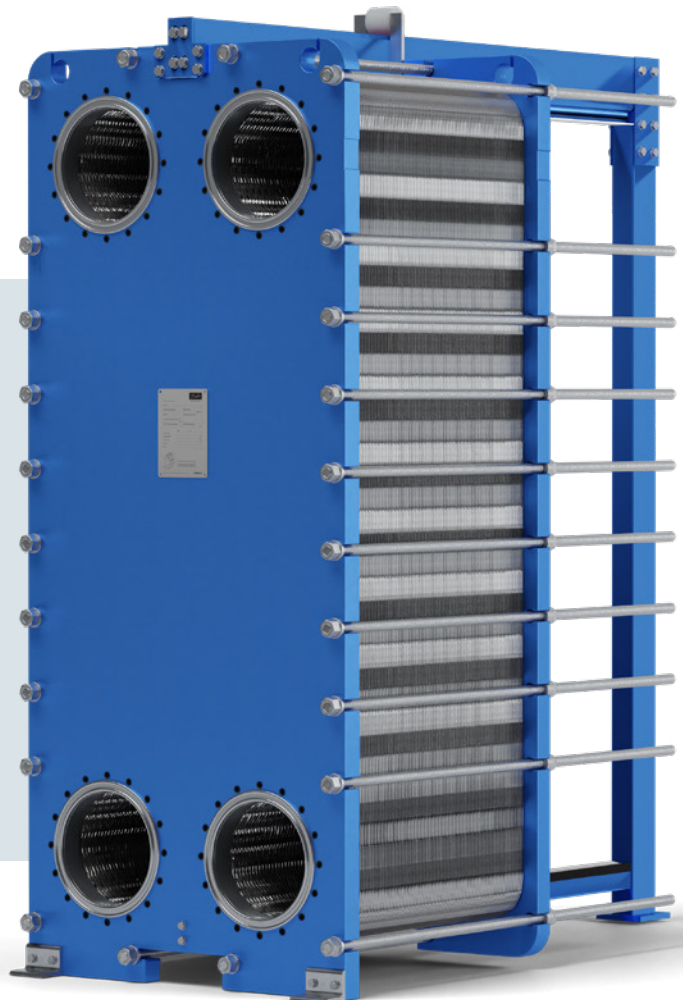
If you would like to know more about how we can help you succeed, please visit our website heatexchangers.danfoss.com or contact your local sales representative.

Facts about Danfoss Heat Exchangers

We design our heat exchangers in close cooperation with our customers to perfectly match the thermal requirements of any duty.

Throughout the years we have developed what has become the largest plate portfolio in the world. Having an option for every application and duty enables us to fine-tune each solution to the specific task at hand.

Optimized to minimize energy consumption and reduce service and maintenance costs, our heat exchangers have competitive prices and a long lifetime.



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