



The ultimate problem solver

Alfa Laval welded spiral heat exchangers



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Improving sustainability with spiral heat exchangers

Alfa Laval's range of welded spiral heat exchangers offer a robust and reliable option for demanding liquid-to-liquid and two-phase duties, with surprisingly low maintenance requirements. With over 80,000 units delivered to support applications across all parts of the hydrocarbon chain, wastewater, mining and much more, they are a well-proven solution when other types of heat exchangers just don't cut it.

High energy savings, low lifetime costs

Alfa Laval spiral designs provide thermal efficiency 2-3 times that of comparable shell-and-tube heat exchangers. They can therefore recover much more waste heat, creating huge potential for increased energy savings. Lower fuel costs combined with reduced emissions offer a smart way to improve the sustainability of your processes and your profitability.

At the same time, a compact design reduces installation and materials costs, while simplified service shrinks your annual maintenance budget. This is why you can expect a short payback time as well as low total cost of ownership.

SpiralPro will never foul up

For processes involving fouling fluids, sludges, emulsions, slurries, fibres or particle loaded liquids, nothing beats the reliability of Alfa Laval SpiralPro heat exchangers. The SelfClean™ design resists fouling and clogging with dirty media that cause problems for any other type of heat exchanger. Maximum uptime and easy cleanability dramatically reduces operational expenses and simultaneously boosts production capacity.

SpiralPro heat exchangers can be configured for liquid-to-liquid duties or as steam heaters.

SpiralCond: the ideal solution for vacuum condensing

SpiralCond heat exchangers are a highly efficient solution for two-phase duties, with a compact, vertical configuration that offers a much smaller footprint than equivalent shell-and-tube heat exchangers. Each SpiralCond is fully customized to the required duty, with channel spacings adjusted to provide the lowest pressure drop. They are therefore ideally suited to challenging vacuum condensing and evaporation duties.

SpiralCond heat exchangers can be installed onto existing process columns or delivered as a stacked column for applications involving multiple cooling media.



SpiralPro
for liquid-to-liquid duties



SpiralPro
for steam heater duties



SpiralCond
for vacuum condensing
and evaporation duties



SpiralCond
in stack configuration

Benefits to solve tough problems

Alfa Laval is the only supplier that has been developing spiral heat exchangers for more than a half-century. Our extensive experience in welded heat transfer technology means that our SpiralPro and SpiralCond models offer benefits that you simply cannot find on other types of heat exchangers:

- Improved heat recovery translates to significant energy savings, along with reduced fossil fuel consumption and CO₂ emissions
- Low installation and operational expenses, along with improved energy efficiency, result in short payback times
- Virtually no fouling or clogging in duties involving very dirty, highly viscous or particulate media
- Easy-to-open design makes cleaning quick and simple, ensuring low maintenance costs
- Reduced pipework and steel structures means lower installation costs.



SpiralPro	SpiralCond
Available for liquid-to-liquid or steam heater duties	Suitable for vacuum condensation or evaporation duties Can be configured onto existing process columns or delivered as a stacked column for applications involving multiple cooling media
Design temperature: -100°C (-148°F) to 400°C (752°F)	Design temperature: -100°C (-148°F) to 400°C (752°F)
Design pressure: Full vacuum to 100 barg (1,450 psig)	Design pressure: Full vacuum to 100 barg (1,450 psig)
Diff. pressure: Up to 50 barg	Diff. pressure: Up to 50 barg
Maximum heat transfer area: 900 m ² (9,688 ft ²)	Maximum heat transfer area: 2,500 m ² (26,910 ft ²) (for stacked columns)

For more product information, visit www.alfalaval.com/spirals

Unique features

Compared to other heat exchangers used in similar applications, Alfa Laval spiral designs offer a more compact footprint with increased thermal efficiency. They are also built with unique features that ensure the most reliable performance:



SelfClean™

Superior cleaning and extended performance

A single channel for each fluid ensures reliable self-cleaning of the unit.



RollWeld™

Automated, reliable channel enclosure

An automated bending and welding process for the closure of each channel ensures consistent quality and reliability.



HighP™

A custom solution for high-pressure duties

Circular shell design and a self-supporting internal coil improves mechanical strength under high pressure.



ALOnsite™

Qualified support at your facility

True onsite service by skilled engineers, anywhere in the world.

Relevant industries for Alfa Laval spiral heat exchangers include:

- Petrochemical
- Refinery
- Steel making
- Pulp and paper
- Mineral processing (metals, ore)
- Wastewater treatment (municipal and industrial)
- Pharmaceutical
- Vegetable oil refining
- Natural gas processing

The ultimate solution for ultimate uptime

Alfa Laval spiral heat exchangers are based on our ingenious SelfClean™ design. A single channel for each media provides optimal heat transfer and flow conditions for a wide variety of fluids – including extremely dirty process media – while ensuring maximum uptime within a reduced footprint.

Fouling is a thing of the past

The SelfClean™ design makes Alfa Laval SpiralPro heat exchangers the ultimate problem solvers for use with media that foul or clog other types of heat exchangers. The continuously curving, single-channel geometry creates high turbulence to minimize fouling from the start. If fouling does start to occur, local velocity increases, since the entire flow must still pass through the channel. This creates a scrubbing effect that flushes away any accumulations of deposits as they form.

Eliminates dead spots

The single-channel geometry offers other important benefits as well. The fluid is fully turbulent at a much lower velocity than in straight tube heat exchangers, and each fluid travels at constant velocity throughout the whole unit. This eliminates the risk of dead spots and stagnation for more efficient heat transfer.

Improved waste heat recovery

Another secret behind the spiral is the true counter current flow, which enables crossing temperature situations where the cold fluid can be heated to temperatures very close to those of the hot fluid. This effect is further enhanced by the high turbulence in the unit.



Frequent cleaning a thing of the past

Mexichem, a global leader in plastic piping systems and in the chemical/petrochemical industries, needed to increase its production capacity to meet market demands.



Challenge

Due to incredibly frequent cleaning needs from fouling, the facility required two shell-and-tubes in alternating operation in the PVC slurry interchanger position.

Solution

Mexichem ordered two compact SpiralPro models with high thermal efficiency to replace the existing shell-and-tubes. After seeing the results of reduced fouling and increased performance, Mexichem quickly followed up with six additional units.

Result

Annual steam savings: €110,000

The ultimate solution to fouling problems

Leuna Germany's MIDER refinery, owned by Total S.A., originally installed two tubular heat exchangers for cooling bottoms product in their fluid catalytic cracking unit.



Challenge

Because the media contained suspended solids, the product sides of the exchangers quickly clogged after a short time in operation. Cleaning, which was needed every ten days, required 3-4 days of downtime.

Solution

The MIDER refinery replaced the tubular units with two Alfa Laval SpiralPro heat exchangers. The SelfClean™ design prevented fouling with the suspended solids, meaning the units could run for over three years without cleaning.

Result

Capital payback time:
Less than one year, thanks to
reduced service costs



Service that keeps you growing

Our spiral heat exchangers are specially designed to keep maintenance to an absolute minimum. But with Alfa Laval, service goes beyond the equipment. With over 50 years of experience with this technology, we can support you with unique expertise to help you get the most out of your heat exchanger and keep your business growing.

Local support from experienced experts

With a worldwide service network, Alfa Laval can make sure there is always a local service technician with the training and knowledge to support your business. Our specialists are here to help throughout the entire lifetime of your equipment, from expert guidance during engineering, installation and commissioning, to advice on cleaning, maintenance and operation throughout the spiral's long service life. When you choose Alfa Laval, you are choosing a partner who will be at your side for the long run.

Low maintenance, easy access

Alfa Laval spirals are designed for lowest possible maintenance, with many customers going years before any routine inspection or cleaning is needed. When it is time to clean, easy-to-open SpiralPro covers make access far simpler than on comparable technologies like shell-and-tube heat exchangers. In fact, a quick hydro-blasting is typically all it takes to return your unit to full performance. All of our spiral heat exchangers can also be cleaned with a Cleaning-in-Place cycle as needed.

You talk, we listen

At Alfa Laval, development is based on our close collaboration with customers. You are our best source of information and inspiration, and better understanding your process challenges has taken our innovation further.

To learn more about our complete service offering for spiral heat exchangers, and the ways our experts work with you to find the optimal solution for your processes, visit: <https://www.alfalaval.com/spirals>.

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