

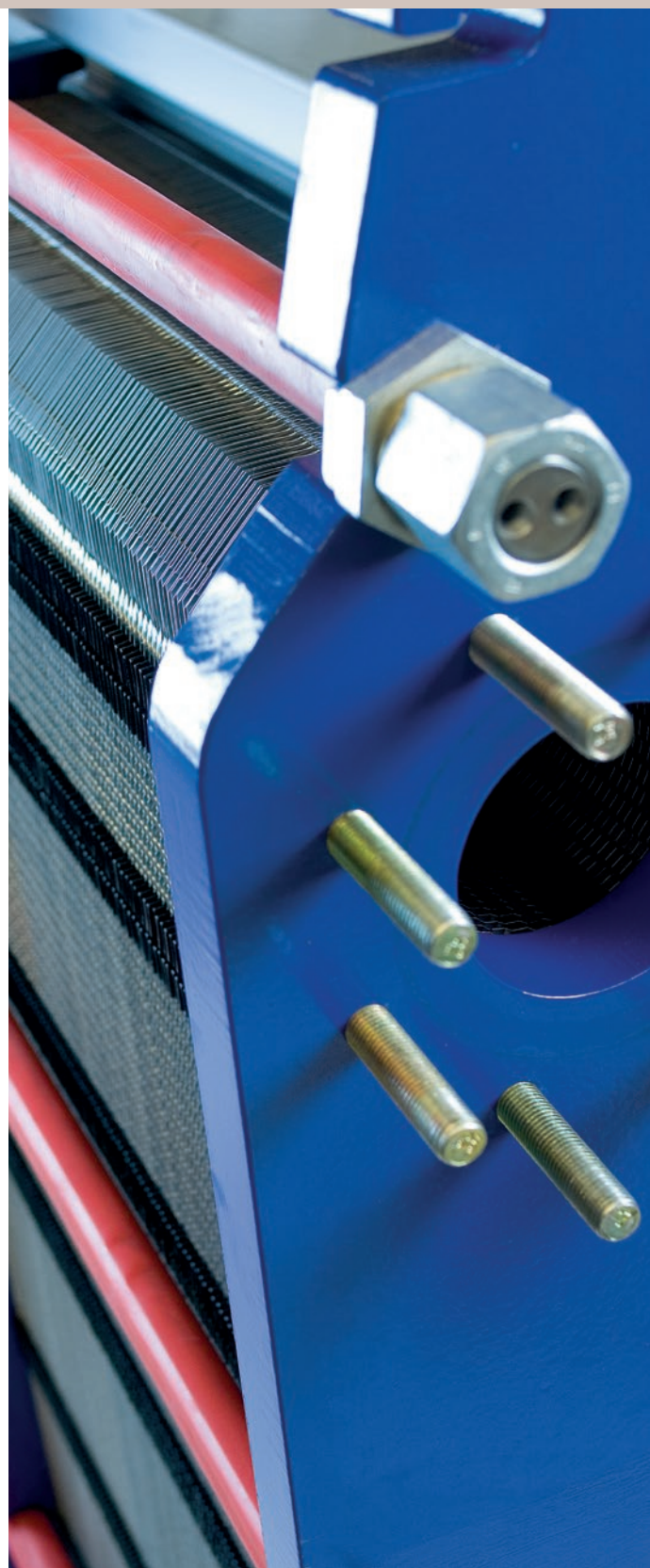
Gasketed plate heat exchangers

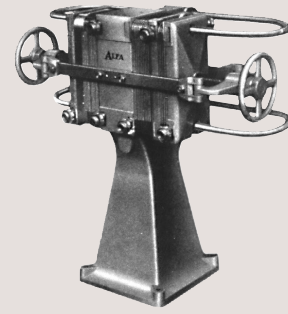
Alfa Laval gasketed plate heat exchangers are the most cost-effective solution available for HVAC heating and cooling applications.

Our gasketed plate heat exchanger range is the result of decades of experience, research and development in heat transfer technology. By combining innovative design with high quality we guarantee maximum performance with minimum operating costs.

At a quick glance the design may seem traditional, but when studying the plates, gaskets and frames in detail the superiority of Alfa Laval gasketed plate heat exchangers becomes obvious. Attention to detail is what gives Alfa Laval the winning edge.

Our products and our sales and service organization make Alfa Laval the ideal business partner, as well as the unquestioned world market leader.





Alfa Laval supplied the first plate heat exchangers to the dairy industry in 1931. Plates were 5-10 mm thick with a milled pattern, compared to 0.4 mm today. In developing our range of plate heat exchangers, we have focused on cost-efficiency.

Reasons to buy gasketed plate heat exchangers from the market leader

Alfa Laval's gasketed plate heat exchangers are designed to meet the highest expectations when it comes to energy efficiency, compactness and reliable performance.

High energy efficiency

With innovative plate design, we provide superior flow distribution across the entire plate surface. This results in excellent heat transfer and high energy efficiency thanks to the elimination of stagnant zones and reduced risk of fouling.

Compact size

The compact design of our gasketed plate heat exchangers makes it easy to fit compact spaces. They come equipped with all features needed for easy installation and quick start-up.

Reliable performance over time

Depending on fluid types, pressures and temperatures, Alfa Laval gasketed plate heat exchangers are tailored to meet highest expectations on performance and lifetime. Alfa Laval gasketed plate heat exchangers are also available as AHRI performance certified versions called Alfa Laval AQ-series. The performance certification is according to AHRI Standard 400 and is verified in the AHRI Liquid to Liquid Heat Exchanger certification program, LLHE.

Easy and safe maintenance

Our gaskets and plate pack alignment design provides easy and cost effective maintenance. The frame is equipped with features that support the unit and secure safe opening and closing during service.



Alfa Laval gasketed plate heat exchangers provide heating and cooling for Federation Complex Towers, Moscow, Russia.



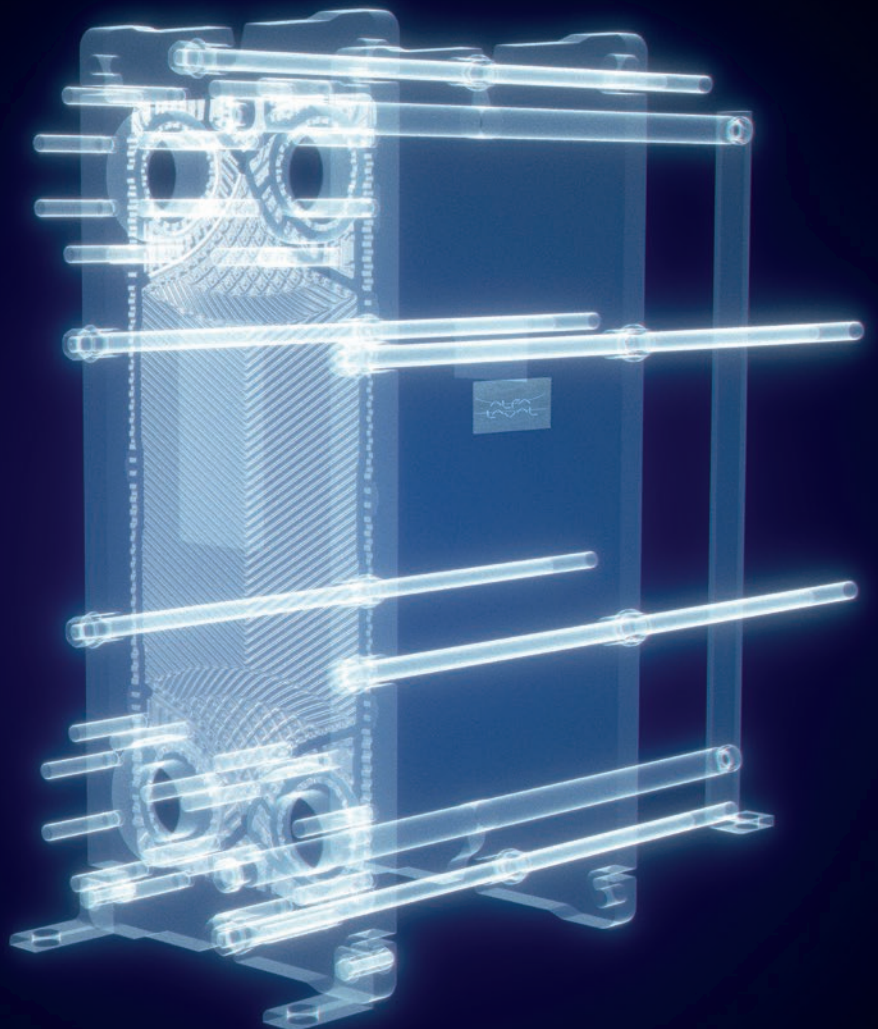
Insights

You need to put quality and reliability in an economic context. It's about how to make processes more efficient, while saving energy. About how optimized performance gives customers the best operating economy. And about how to minimize impact on the environment and climate change.

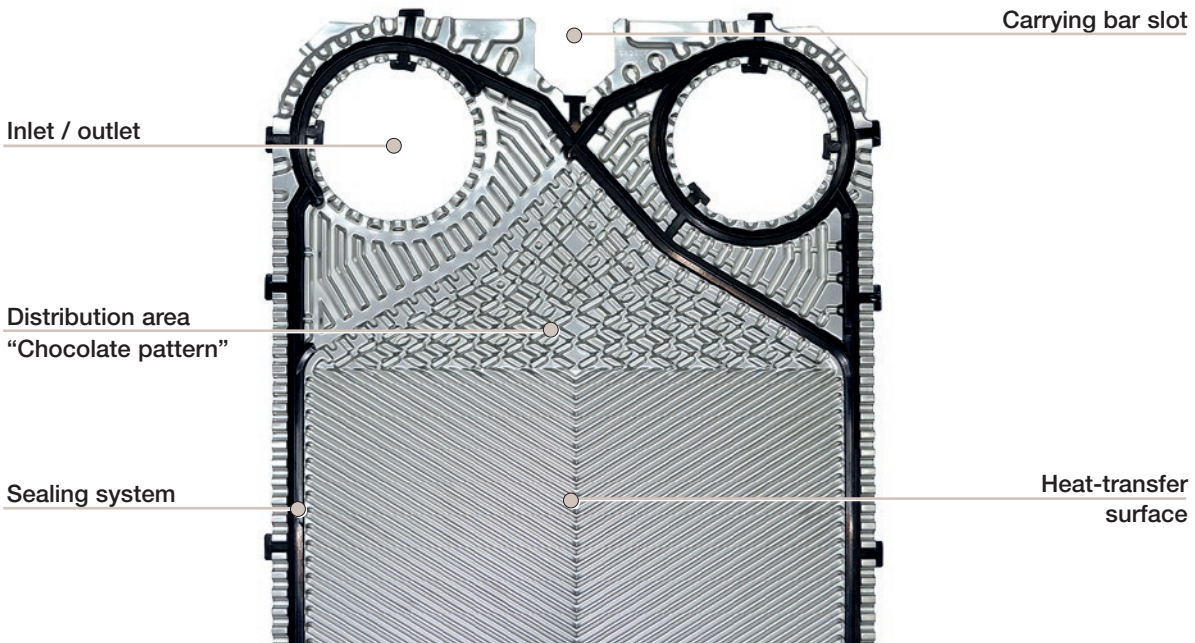
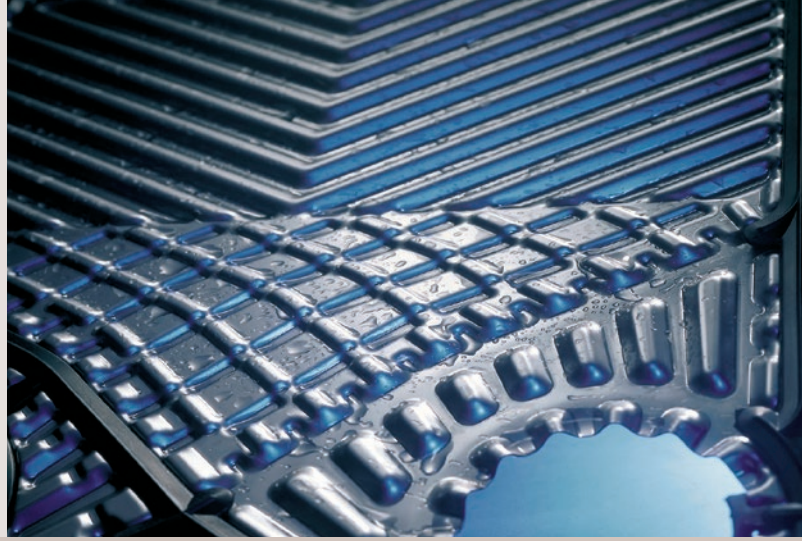
Above all it is tackling the need to build long life into equipment to minimize total cost of ownership and maximize profitability. Why governs how.

These are the insights Alfa Laval is using to build gasketed plate heat exchangers. Take a closer look behind the surface. There's more to see than what meets the eye – actually there's a whole story to tell.

Energy efficiency at its peak



Plates



The heat-transfer surface

The heat exchanger plates are pressed in a so-called herringbone corrugation pattern. When two plates are superimposed with opposing herringbone patterns, this type of corrugation generates a helix-like flow with very high turbulence, thus producing the essential condition for achieving high transfer coefficients and effective heat exchanger self-cleaning. By changing the plate corrugation pattern, the heat exchanger can be used in different processes, even those with very dirty media.

Dead spots, that are the main cause of corrosion and fouling, are eliminated. Customers will benefit from reduced maintenance cost and increased uptime.

around the ports. The gasket is installed in the conventional manner and the welded plate pairs are assembled in a plate pack in the same way as ordinary single plates.

Special plates

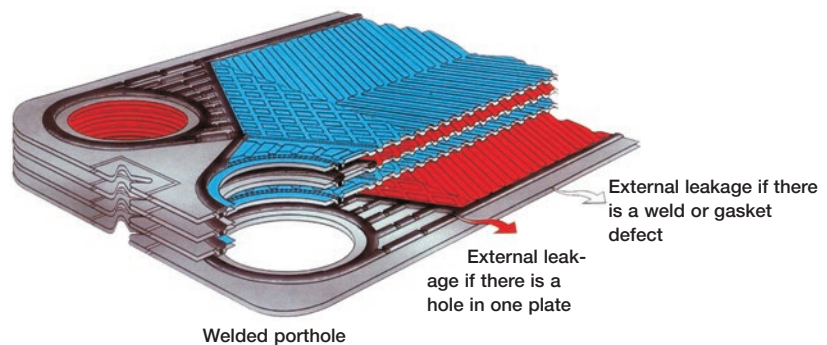
Double-wall plates

Double-wall gasketed plate heat exchangers are ideal for use with fluids that must not be allowed to mix. Pairs of identical plates are laser-welded

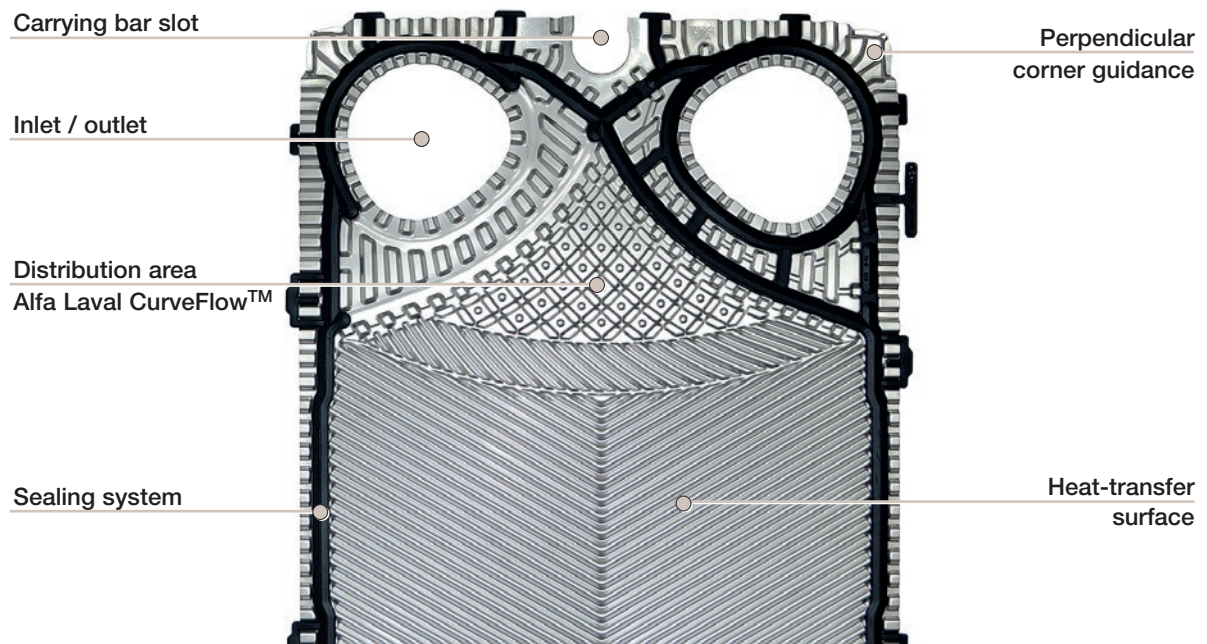
In the unlikely event of leakage through a plate because of a puncture or crack, the leaking fluid will never come into contact with the fluid in the other circuit, as it will be stopped by the double plate and flow outside the heat exchanger.

The distribution area

The plate distribution is pressed in a so called chocolate pattern, an Alfa Laval innovation. This type of corrugation has numerous advantages. Among the most important are; it optimises flow distribution over the entire transfer surface, ensuring highest energy efficiency.



The world's tallest building stays cool in the scorching desert sun thanks to an innovative thermal ice-storage system and Alfa Laval gasketed plate heat exchangers. Burj Khalifa, Dubai, United Arab Emirates.



New plate innovations

Alfa Laval CurveFlow™

The new design of the distribution area means superior flow distribution and more of the available pressure drop over the main heat transfer area. This results in a number of benefits for the customer:

- A more compact heat exchanger – less plates needed.
- Increased energy efficiency – better flow distribution reduces the risk of fouling build up, reducing the need for increased pumping power to compensate for higher pressure drop.
- Reduced maintenance costs – fewer plates mean faster cleaning and low cost for spares.

Up to 15% higher efficiency

With the new Alfa Laval CurveFlow™ design the media is more optimal distributed over the entire plate width. Additionally, the cross corrugation pattern between the distribution surface and the main heat transfer area gives improved heat transfer. Compared to a traditional plate design it is also possible to use thinner plates at high pressures. Total improvement of the heat transfer efficiency is up to 15%.

Higher flow capacity

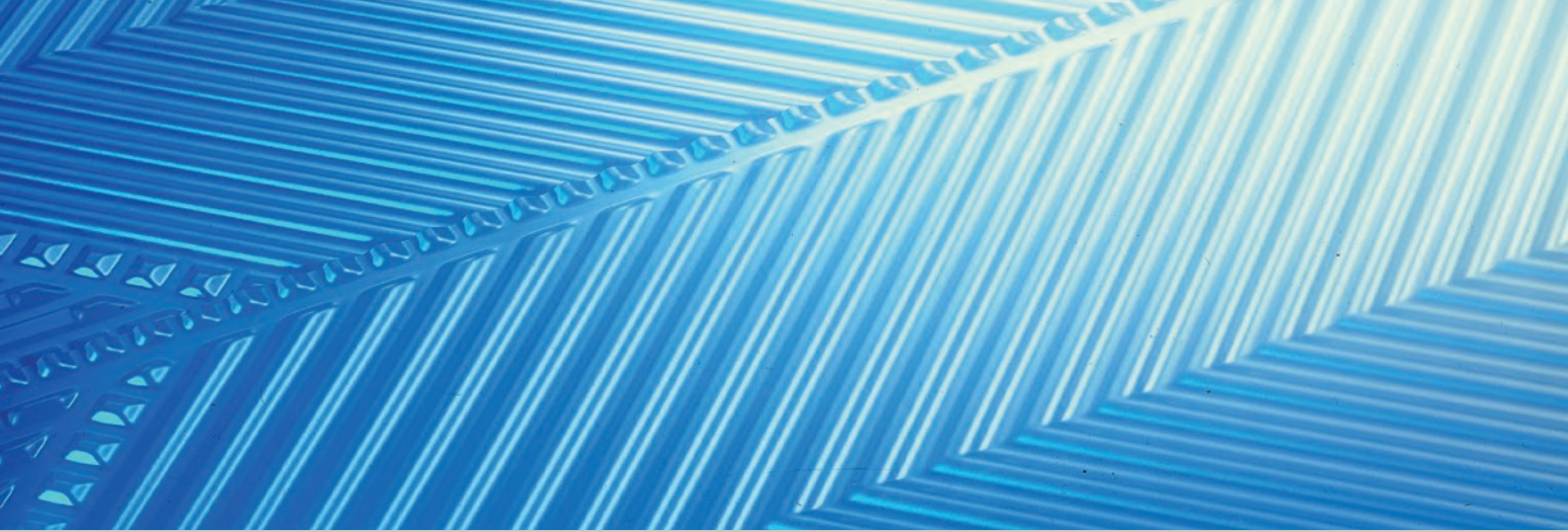
Thanks to the non-circular ports, the port area in the plate has increased compared to a conventional circular design. This equals to higher flow capacity at the same velocity, allowing higher utilization.

Up to 40% improvement in self-cleaning capability

Thanks to the new Alfa Laval CurveFlow™ design the media will have up to 20% higher velocity at the far end of the plate width. This will improve the shear stress over the heat transfer area by up to 40%, thus minimizing the risk of fouling build-up at the most critical part of the plate.

Perpendicular corner guiding

The new corner guiding design ensures that the plate pack is perfectly aligned independent of the number of plates. A perfect alignment ensures a reliable performance of the heat exchanger and faster closing of the unit after service.



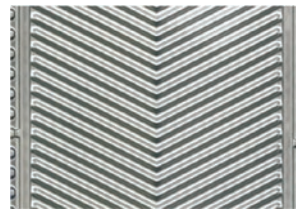
Channel types

We have two plate corrugations (L and H)

These form three different channels (L, M, H)



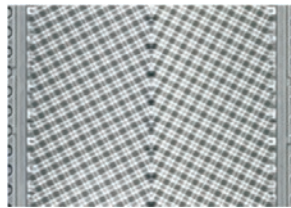
L: Low theta



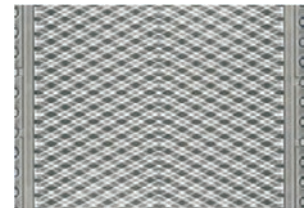
H: High theta



L + L = L channel



L + H = M channel



H + H = H channel

Optimal channel type is selected on the basis of the temperature program to be satisfied and the maximum permissible pressure drop

Channel characteristics

Low turbulence
and pressure drop



"L" channels



Medium turbulence
and pressure drop



"M" channels



High turbulence
and pressure drop



"H" channels



Advantages

- Efficient heat transfer
- High turbulence
- Variable thermal length
- Low pressure drop

Benefits

- Increased heat recovery
- High self-cleaning coefficients
- Low heat-transfer surface area
- Low pumping costs

Gaskets



The gaskets in Alfa Laval gasketed plate heat exchangers are parts of an advanced hydraulic sealing system designed for high performance and long operating life.

Our gasket profiles produce a highly efficient seal, minimizing the risk of leakage.

The performance of a heat exchanger is influenced by different components and places very high demands on the gasket system. To obtain highest performance, it is important that the plate and gasket are designed together.

A correctly designed gasket has a high enough sealing force to prevent leakage, but not too high in order to prevent gasket and gasket groove damages. Alfa Laval offers gaskets which are based on the roof top gasket profile, as this has proven to be most effective.

The rib top gasket family is the next generation gasket developed by Alfa Laval. It is a further development of the traditional roof top gasket profile.

The roof on this next generation gasket is less edgy and there is a rib on top of it. The rib top profile with less rubber mass gives an outstanding sealing performance, reducing the risk of gasket and plate damages and leakages due to plate misalignment.

All gaskets are made from a single uniform rubber by the best suppliers. In addition, they are moulded in one piece, guaranteeing exact gasket geometry with no weak links from vulcanisation. Gaskets are available in a wide range of elastomers, the most common being Nitrile rubber and EPDM.

Alfa Laval was the first heat-exchanger manufacturer to develop and use the glue-free clip-on system that makes it easier to replace gaskets during maintenance, thus saving time. Recently Alfa Laval introduced a new glue-free system called Alfa Laval ClipGrip™ which improves the gasket fastening and sealing reliability even further.

Gasket groove design ensures minimum contact between the gasket and the media, helping extend the heat exchanger's operating life. The groove on the plate and the gasket match perfectly, ensuring that the gasket is fully supported.



Examples of Alfa Laval roof/rib top gasket family

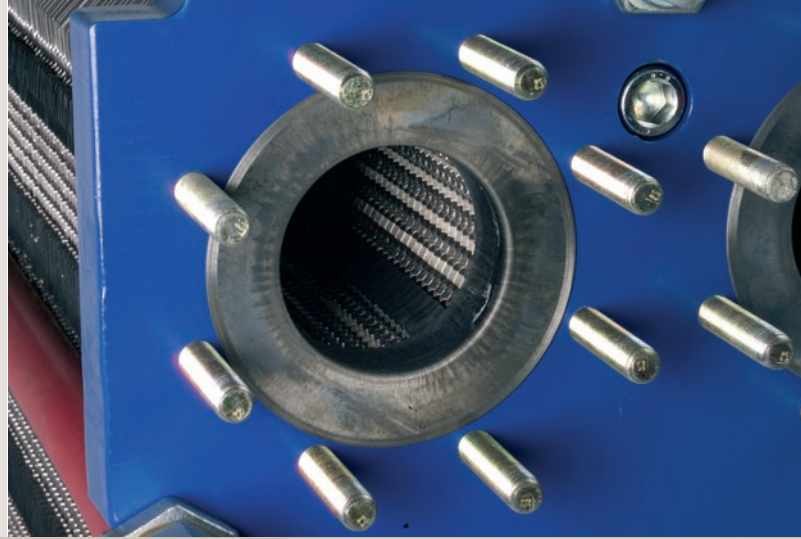


Glue-free ClipGrip™ system



Glue-free Clip-on system

Frame



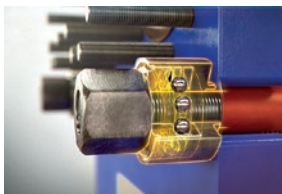
Designed with lowest cost of ownership

The frame features will ensure:

- Reduced maintenance cost
- Reduced spare part costs
- Staff safety
- Time savings

Alfa Laval gasketed plate heat exchangers of all sizes can be opened quickly and easily for inspection and gasket replacement by one man using standard tools. They are reassembled just as easily. Our large units feature Alfa Laval's 5-point alignment system. Precise positioning of the plates horizontally and vertically ensures efficient sealing throughout the plate pack. A roller on the pressure plate, and bearing boxes on the four tightening bolts, make opening and closing an easy task.

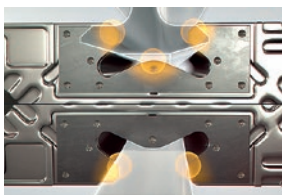
Simpler in design, our smaller gasketed plate heat exchangers are equally service-friendly, while keeping costs to a minimum. During reassembly, alignment of the plate pack is achieved using the round carrying and guide bar. Corner guides lock the plates in position and ensure perfect final alignment.



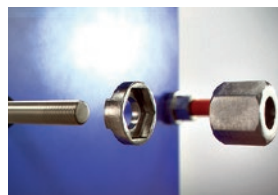
Bearing box – makes opening and closing the heat exchanger easier – will reduce maintenance time and increase staff safety.



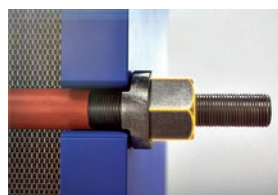
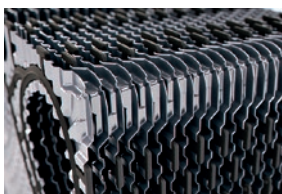
Key hole bolt opening reduce risk of tightening bolts falling out and allows bolt to be removed sideways – will reduce installation and maintenance cost and ensure staff safety.



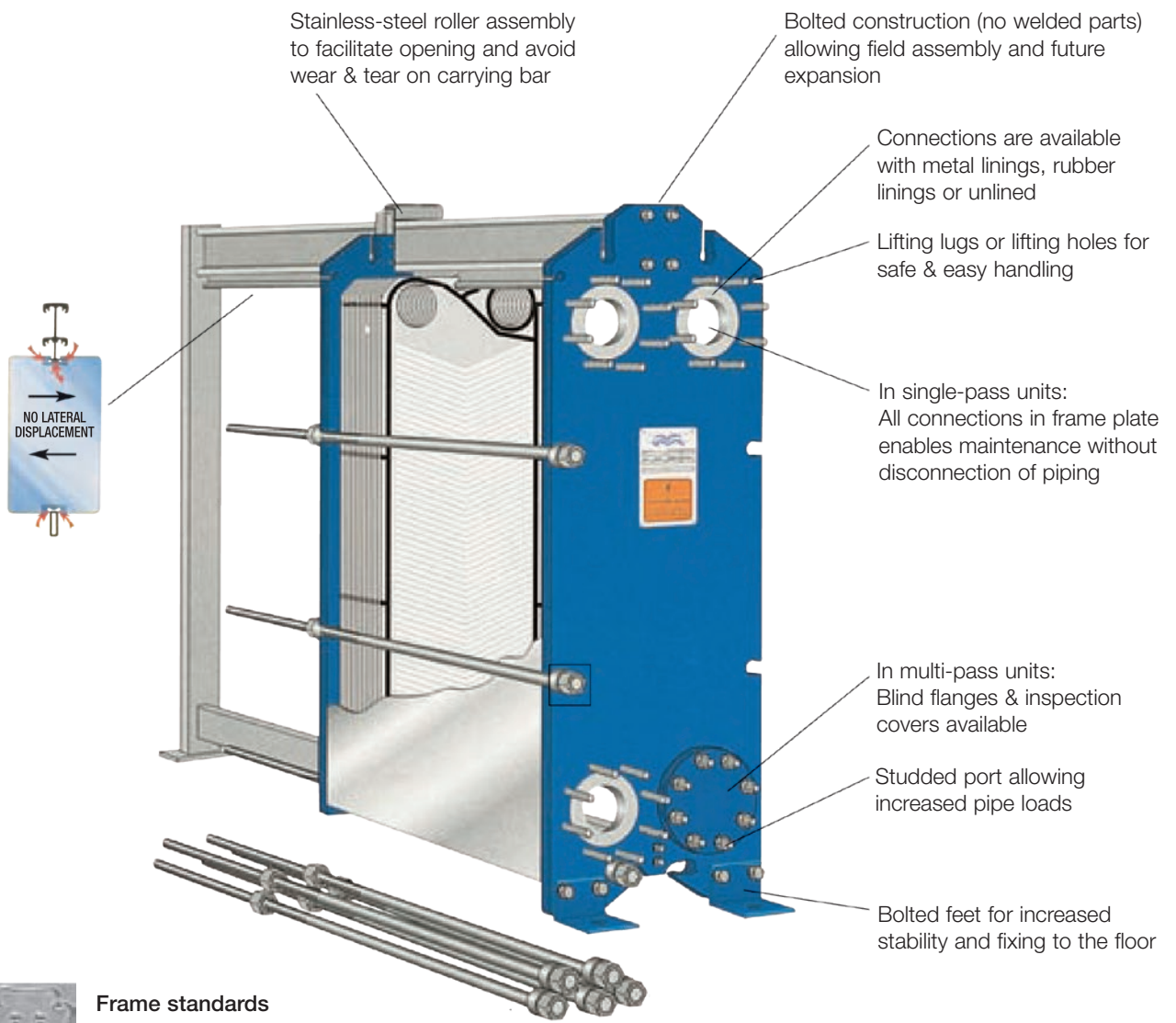
5-point alignment system and perpendicular corner guidance. Perfect plate alignment avoiding plate pack leakages and additional necessary openings & closings of the plate heat exchanger – will reduce maintenance time and spare part cost.



Lock washer requires one man instead of two to loosen the tightening bolts and reduce the risk of bolts falling out – will reduce maintenance cost and increase staff safety.



Elongated nuts reduce nuts seizing on tightening bolt – will reduce cost for maintenance and spare parts.



Frame standards

- ASME, U and UM



- PED/CE marking
- Alfa Laval standard for other, local PV rules.

When performance is crucial



Alfa Laval AlfaQ™ AHRI-certified gasketed plate heat exchangers

When performance is crucial, each component of an HVAC system must be optimized to perform exactly as specified.

The Air Conditioning, Heating and Refrigeration Institute (AHRI) Standard 400 certification is an independent, third-party verification of thermal performance. AHRI 400 is now a global standard, assuring customers worldwide that the heat exchangers they choose will perform according to specification.

Performance certification verifies that the product performs in accordance with the manufacturer's published ratings, and is particularly useful in applications such as district-cooling substations with plate heat exchangers, ice-storage systems, data centres and free-cooling systems.

Alfa Laval was the first to offer a broad range of heat exchanger innovations – the AlfaQ™ range – that are certified to AHRI 400.

Certification leads the “green” wave

AHRI-certified heat exchangers can meet the Leadership in Energy and Environmental Design (LEED) standards for heating and cooling applications. LEED is an internationally recognized mark, providing building owners and

operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

Through its certification program and standards, AHRI strives to help customers save energy, improve their productivity and contribute to a better environment.

AHRI Certification Procedures and Benefits

Performance deficiencies in an HVAC system are difficult to detect and can result in much higher energy costs. Certification of all components assures the buyer that the system will perform optimally.

To certify a product to AHRI standards, the manufacturer submits specifications and performance data to AHRI for performance evaluation and potential certification.

The certification assures buyers and users that:

- The gasketed plate heat exchanger will perform in accordance with the manufacturer's published ratings.
- Product performance can be easily compared for their specific application.

Alfa Laval has accomplished a 100% success rate in the AHRI performance certification program for more than a decade.

Cost-effective for everyone involved

Consultants

- Allows for the design of a system in which all the major components are independently performance certified, ensuring that targets on power consumption and climate control can be met.
- Provides a verifiable basis for heat exchanger selection.
- Protects the owner and consulting engineer from performance concerns during commissioning and after installation.

Contractors

- Eliminates field acceptance tests of each component, thereby reducing payment hold-back times after commissioning.
- Ensures that all certified gasketed plate heat exchangers included in proposals will deliver the stated thermal performance.
- Reduces troubleshooting time during commissioning and after start-up.

End users

- Reduces lifetime operating costs significantly by assuring a more energy-efficient system.
- Ensures full investment value by reducing costs for field tests and additional component performance margins.



Alfa Laval AlfaQ™ gasketed plate heat exchangers, the optimal choice

Alfa Laval's broad range of heat exchangers for HVAC applications include gasketed, semi-welded, fully-welded, double-wall plate, and brazed heat exchangers. The AlfaQ™ Series are part of our gasketed plate heat exchanger portfolio.

AlfaQ™ gasketed plate heat exchangers are available to meet most heat-transfer

requirements – whether large or small – and include a three-year warranty, demonstrating our commitment to optimizing the performance of our customers' processes.

AlfaQ™ Series is the optimal choice when performance is crucial.



Insulation



Insulation

Insulation, designed for HVAC applications, is available for most gasketed plate heat exchanger models. There are two different types of insulation – heating and cooling insulation.

The reason for having two different types is that the mineral wool will be wet from condensing water if used when the heat exchanger temperature is lower than the surrounding temperature. Polyurethane is more expensive than mineral wool, but technically the cooling insulation can be used for heating duties as well.

Drip tray

The Alfa Laval drip tray insulates the heat exchanger from the floor, and it also collects any condensate formed on the outside of the heat exchanger. The drip tray also collects any remaining water (after drainage) in the gasketed plate heat exchanger when the unit is opened for inspection or maintenance. The drip tray consists of 0.75 mm hot galvanized steel plates, 50 mm polyurethane foam, supports of waterproof wood, and a draining valve.



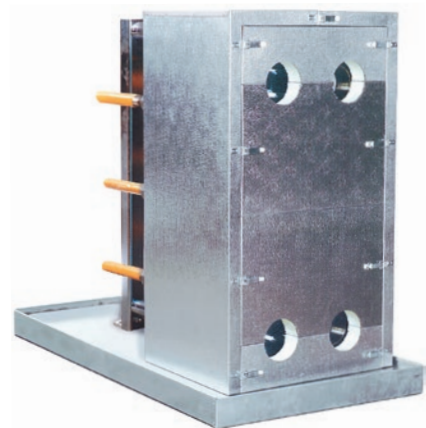
Heating insulation

Heating insulation consists of 65 mm of mineral wool, cladded with a 1 mm aluminium sheet on the outside and aluminium foil on the inside. It covers all sides of the gasketed plate heat exchanger including the frame and pressure plate, except downwards. The different parts are held together with snap catches.



Cooling insulation

Cooling insulation consists of 60 mm of polyurethane, cladded with a 1 mm aluminium sheet on the outside and aluminium foil on the inside. It covers all sides of the gasketed plate heat exchanger including the frame and pressure plate, except downwards, where there is a galvanized drip tray. The different parts are held together with snap catches.



Protection sheet

A protection sheet is a device covering all sides of the plate pack except downwards. It is used to prevent persons from getting injured if a sudden leak of hot, corrosive or toxic media should occur. The Alfa Laval protection sheet consists of one or more aluminium or stainless-steel (AISI 304) sheet(s) formed to fit the gasketed plate heat exchanger. On most frames the sheet is fitted between the plate pack and the tightening bolts.



Alfa Laval Service



Extending performance

Alfa Laval's global service network ensure optimal performance of your Alfa Laval equipment throughout its life cycle. To bring you maximum uptime and return on investment, our committed team draws on 130 years of process and application knowledge.

Our goal is to optimize the performance of your process by for instance redesigning your gasketed plate heat exchanger to match your new process requirements or reconditioning it to a good-as-new state, thus making sure to maximize uptime.

But we go even further. We also ensure our top-class service engineers are with you when and where you need them, at your site or in our service centres.

Complete 360° Service Portfolio for gasketed plate heat exchangers

Start-up

- Installation
- Commissioning

Maintenance

- Reconditioning
- Cleaning services
- Service tools
- Spare parts

Support

- Telephone support
- Exclusive stock
- Training
- Troubleshooting
- Technical documentation

Improvements

- Equipment upgrades
- Redesign
- Replacement & Retrofit

Monitoring

- Performance Audit
- Condition Audit

Reconditioning

Reconditioning your gasketed plate heat exchanger can extend its lifetime; minimize operational costs; ensure safety, quality and productivity; and satisfy new environmental legislation by improving energy efficiency.

You can choose from a number of pre-defined reconditioning packages, or customize a package from the complete list of Alfa Laval reconditioning services, to match your requirements for turn-around time, budget, brand and/or application.

Spare parts

Correct material quality can make a huge difference to your process. By using genuine Alfa Laval Spare Parts you can rest assured that the correct material is specified according to its intended use.

Alfa Laval genuine plates are made using a single-step pressing method ensuring uniform plate strength and thickness over the entire plate – dramatically reducing the risk of fatigue cracking.

Alfa Laval genuine rubber gaskets ensure tighter seals, longer life and more uptime for gasketed plate heat exchangers.

Uptime – skilled experts assist you with proper service that prevents unplanned interruptions, using certified materials.

Availability – we are committed to providing easy access to specialist support and the right parts for your Alfa Laval equipment.

Optimization – our innovative services and solutions are available to help your existing equipment adapt to your evolving needs.

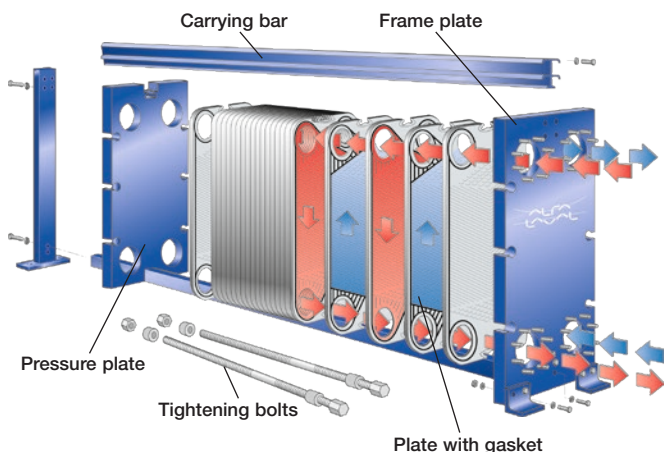


Ten top tips



To keep your gasketed plate heat exchanger in tip top condition

- 1 Make sure that the operating conditions (temperatures and flow rates) comply with the design specifications.
- 2 At start-up, vent the heat exchanger but open and close the valves slowly to avoid pressure surges and water hammer.
- 3 Use upstream filters and strainers to remove particulate fouling and protect the heat exchanger.
- 4 On a daily basis check for any changes in temperature or pressure and check for any signs of external leaks.
- 5 On a regular basis keep the tightening bolts clean and well-lubricated.
- 6 Use condition monitoring techniques to avoid having to open the gasketed plate heat exchanger for inspection.
- 7 Use Cleaning-In-Place (CIP) to avoid the need to open the heat exchanger for cleaning.



- 8 Always keep stand-by units clean and dry. If a heat exchanger is taken out of service, flush with fresh water and drain it completely.
- 9 Protect heat exchangers from water splash and rain. Avoid exposure to ultra violet rays and ozone typically generated from electrical sources.
- 10 Only use genuine spare parts for guaranteed performance, reliability and equipment life. Maintain a stock of essential spare parts and follow the storage instructions.

Alfa Laval Service
Extending Performance