Kelvion /



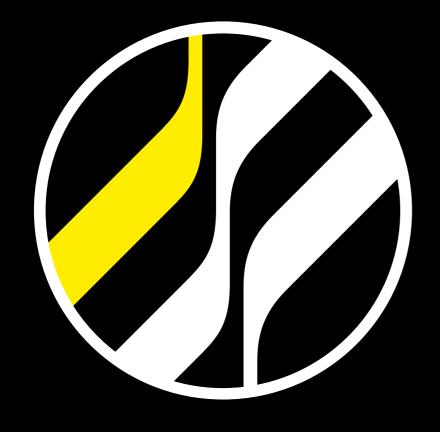
HOTLINE : Ms. Quỳnh PHE 0931-576-256

Product Line: Gasketed Plate Heat Exchangers

QUALITY AND FLEXIBILITY AT ITS BEST



Kelvion

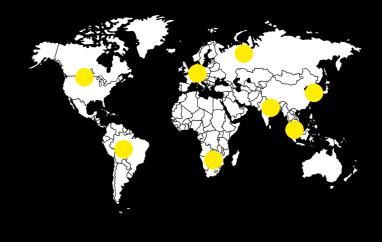


<mark>KELVION</mark> — A TRIBUTE TO LORD KELVIN (1824 - 1907)



Lord Kelvin formulated the laws of thermodynamics and absolute units of temperature are stated in kelvin, in his honor.

67 BRANCHES AND SALES PARTNERS WORLDWIDE



EXPERTS IN HEAT EXCHANGE – SINCE 1920

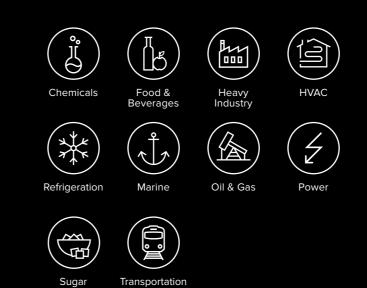
Welcome to Kelvion! Where Heat Exchange is our Business. We are one of the leading global manufacturers of heat exchangers and have been providing solutions for almost every industrial application imaginable since the 1920s, specializing in customized solutions suitable for extreme environmental conditions - as of 2015 under the name of Kelvion.

With one of the most extensive selections of heat exchangers in the world, we are a well-known partner in many industries, including transportation, energy, oil and gas, the heavy industry, chemical and marine as well as sugar, food and beverage and the HVAC and refrigeration technology sector. Our products include Compact Fin Heat Exchangers, Plate Heat Exchangers, Single Tube Heat Exchangers, Transformer Cooling Systems, Cooling Towers and Shell & Tube Heat Exchangers. Our many years of experience and in-depth expertise have made us specialists in this field. Our heat exchangers are designed specifically to meet the needs of the respective machine or equipment system, ensuring outstanding energy efficiency and reliability in any market segment. This gives our customers a cutting-edge over their competitors while also reducing operating costs over the long term.

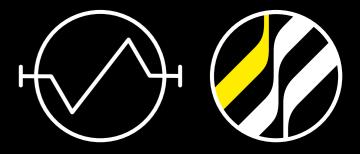
As your heat exchange partner, we understand that outstanding and reliable after-sales services are critical for you, our customer, and we work alongside with you in close partnership supporting you throughout the full life cycle of your plant and equipment to ensure lasting business success.

Kelvion – Experts in Heat Exchange.

YOUR MARKETS ARE OUR MARKETS



OUR LOGO - INSPIRED FROM THE SCHEMATIC FOR HEAT EXCHANGER



5,000 EMPLOYEES WORLDWIDE

KELVION HAS A LONG <mark>HISTORY</mark>



Kelvion Plate Heat Exchangers

TAILOR-MADE SOLUTIONS

As the worldwide technology leader in the manufacture and development of plate heat exchangers, we have one of the most extensive product ranges on the market. Our product diversity varies from gasketed to brazed and even welded plate heat exchangers. This includes process-optimised series that are unique in their number and special functions. This makes us absolute specialists when it comes to developing tailor-made solutions for your applications.

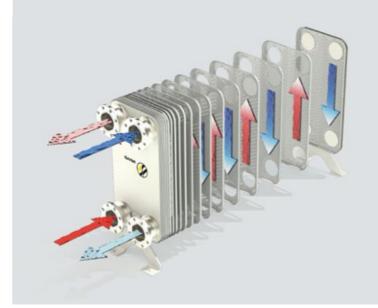
At Kelvion, we invest extensively in research and development. This enables us to continuously develop efficient plate types for new fields of application.

This commitment secures and extends our core competencies, to the benefit of our customers.

BRAZED **PLATE HEAT EXCHANGERS**

The product range of our brazed series offers the widest variety and flexibility in terms of size, brazing material, different connections, flow arrangements and accessories.

- ▶ Tailor-made economical design for the most varied applications
- ► Long lifetime
- ► Highest efficiency
- ► Highest quality



GASKETED **PLATE HEAT EXCHANGERS**

Designed with ease of maintenance in mind, our gasketed plate heat exchangers can be adjusted if requirements change and can easily be opened for cleaning – suitable for a wide range of applications with medium to large volume flows.

- ► High efficiency at low operating costs
- ► Wide application spectrum at lower investment costs
- ▶ High range of plate corrugations, connection sizes, plate widths and lengths
- ▶ Maintenance-friendly assembly and sealing technologies

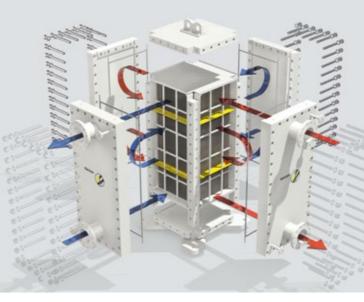




WELDED **PLATE HEAT EXCHANGERS**

Combining high heat transfer coefficients of a plate heat exchanger with the advantages of rugged welded design, they are the perfect partner for demanding applications with medium to large volume flows.

- ► K°Bloc: Oil and gas, chemical and petrochemicals use. Withstands high temperatures and pressures.
- ▶ K°Flex: Efficient, turbulent heat transfer for power stations or applications in the sugar industry requiring high output density.
- ▶ REKULUVO/REKUGAVO: High-efficiency heat recovery for SCR Systems.









APPLICATIONS



Gasketed Plate Heat Exchangers

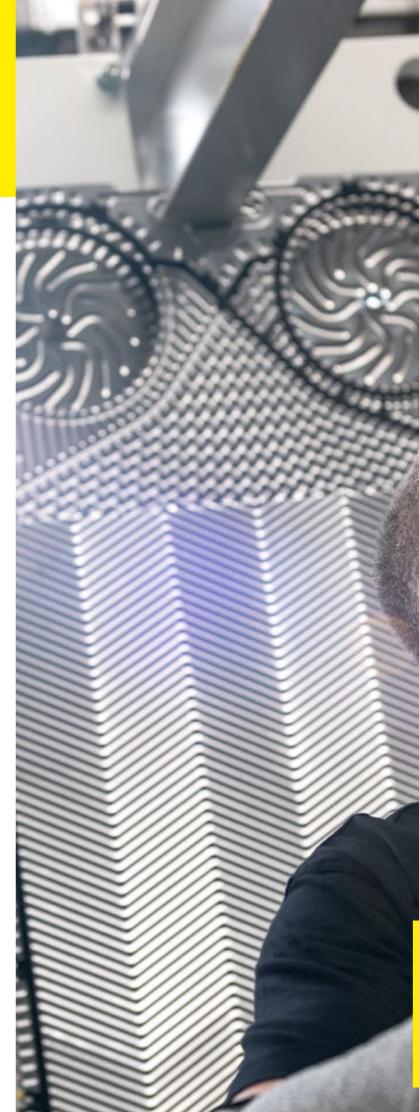
LEADING TECHNOLOGY FOR ALL APPLICATIONS



Your global Partner providing all Industries with trusted Plate Heat Exchanger Technology and Service where Expertise is needed. Reliable. Sustainable. Efficient.

The gasketed plate heat exchangers reveal what passion, scientific curiosity and technological expertise can achieve. Continuous further development of the plate series, targeted at the requirement of the thermo and hydrodynamic industries, ensure that you can achieve maximum economic efficiency. The range of plate corrugations and plate lengths enables them to be made to measure to your requirements.

In addition, maintenance-friendly assembly and sealing technologies are applied, which assure the flawless seating of the gasket and plate package.



WHY CHOOSE KELVION?

- Global Application Sales & Service Network
- High Application & Product competence
- Reliable Partner
- Sustainable
- Efficient

Gasketed Plate Heat Exchangers

QUALITY AND FLEXIBILITY

We successfully merged many years of experience with industry-leading research to develop our gasketed plate heat exchangers. These versatile models are suitable for a wide range of applications.

Frame

Thanks to the modular design principle of our N-Series units, our Sales & Application engineers can choose the most suitable plate series, as well as frame independently, and combine these to find the best configuration of your heat exchanger.

Generally, gasketed plate heat exchangers consist of two main components:

Plate Pack: Transfers the heat from hot to cold fluid. The core of a unit is a package of corrugated metal plates with portholes for the inlet and outlet of two fluids. These heat transfer plates are fitted with gaskets, which seal the channels between two heat transfer plates and direct the fluid into alternating channels. In standard configuration, the hot and cold fluid flow in countercurrent flow.

Frame: Forms the heat exchanger's pressure vessel. The plate pack is assembled between two frame plates and compressed by tightening bolts. The loose frame plate is suspended from the carrying beam and held in place by a structural guiding system. Inlet and outlet connections for the piping are located on the frame plates.

Plate Pack

PLATE FEATURES

Our plates are the most technologically advanced heat transfer plates on the market, with features for efficient processing of all products, including those with high viscosities and fouling tendencies.

There are different plate parameters influencing the heat transfer, as well as pressure drop and resistance of the plate pack and the type of media it can handle:

PLATE CORRUGATION

Flow channels formed by corrugated plates like in our heat exchangers create turbulent flow. The higher the turbulence the higher the heat transfer rate, thus the smaller the heat exchanger area required for a required performance. Turbulent flow also reduces the fouling tendency inside the heat exchanger and leads to a self-cleaning effect.

This has two positive effects with respective benefits for our customers:

- Small footprint:
- Low investment cost
- ► Longer service life / intervals between cleaning: Less downtime

PLATE MATERIAL

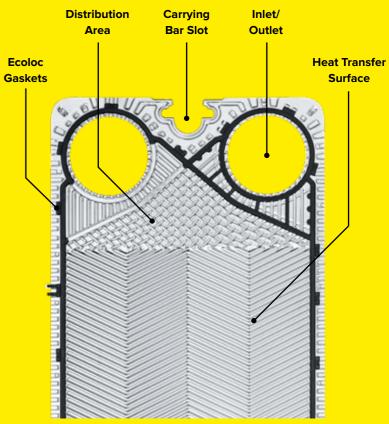
The choice of plate material is important for the corrosion resistance.

We offer the following materials:

- Stainless Steel 1.4301 / AISI304 1.4404 / AISI316L
- ▶ Super austenitic stainless steel / Nickel based alloys 1.4539 / AISI904L 1.4547 / 254SMO C276 Nickel 201

► Titanium Titanium Titanium Palladium

Other materials on request. Material selection influences the pressure resistance.



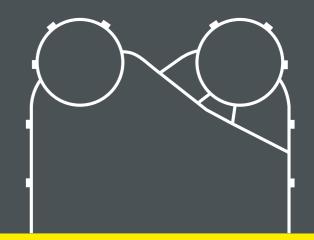
GASKET MATERIAL

The choice of gasket material depends on the media, in particular their chemical properties (e.g. acid pH value, ...).

The following types are available:

- ▶ NBR ▶ EPDM
- ► FKM (Viton)
- CR (Neoprene)

Gasket material limits the allowable temperature.



CORRUGATION TYPES

The standard for the gasketed plate series is herringbone (fishbone) corrugation sometimes also called chevron corrugation. We offer three different subtypes of

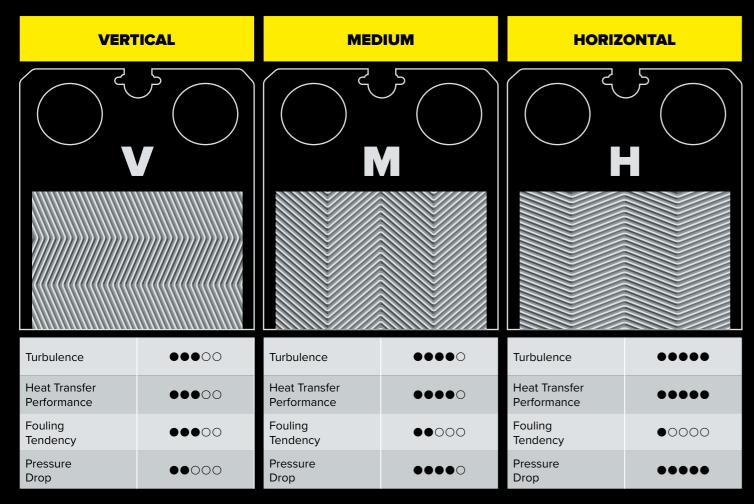
HEAT

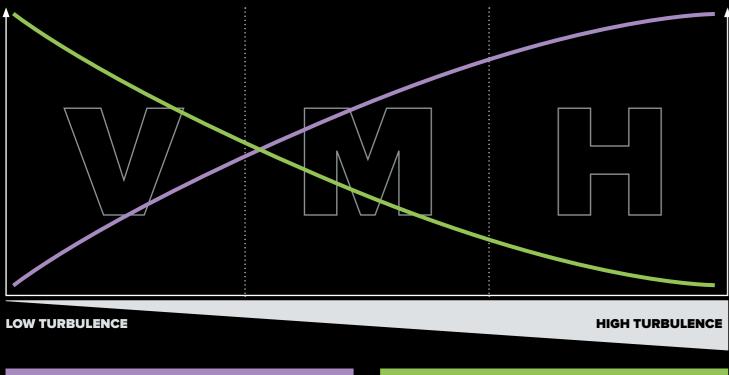
TRANSFER

SELF

CLEANING

herringbone plates. Combinations of different herringbone subtypes are possible to achieve the optimum operation point for your requirements.





INVESTMENT

FOOTPRINT

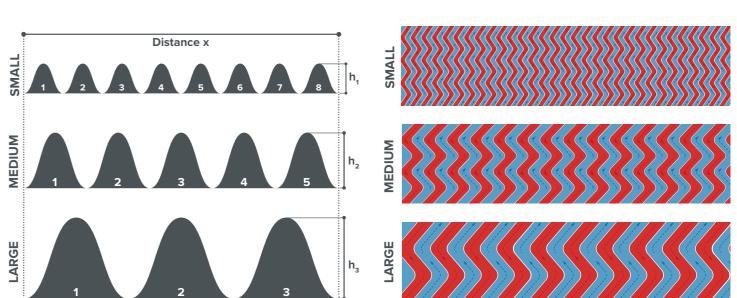
FOULING

PRESSURE

DROP

GAP SIZE

Regardless of the type of corrugation is selected, an important factor is the pressing depth which determines the size of the gap (flow channel) between the two plates. The smaller the gap the higher the turbulence and thus the heat transfer efficiency. This leads to a smaller footprint and low investment cost.



PARTICLE SIZE	
FARTICLE SIZE	
CLEAN MEDIA	
NX PLATE NP PLATE	

FREE FLOW

At Kelvion we are one of the few manufacturers that also offer a plate series with real free flow corrugation, looking like a washboard.

While for herringbone plate series the key focus lies on efficiency and pressure resistance, here it's the treatment of difficult media (e.g. with fibres) that go beyond the capabilities of herringbone plate pack.

Plates with this corrugation form free flow channels of constant width and without contact points. But, thanks to the gentle corrugation waves, they are more efficient and show less fouling than e.g. shell-and-tube heat exchangers. Various media can be used in different gap sizes:

- ▶ Small gaps can only handle clear and low-viscous media.
- Even small particles would block the gap.
- ▶ Medium size gaps are suitable for viscous media or small particles.
- ► Large gaps gently treat highly-viscous media
- or can handle media containing particles.

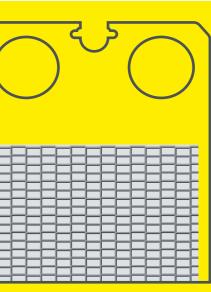
NF PLATE

NW PLATE



MEDIA WITH PARTICLES

CONTENT





FRAME FEATURES



FRAME TECHNOLOGY

While the plates are key to meeting heat transfer challenges, the frame plays an important role in creating a most cost efficient pressure vessel.

For our N-Series plates we have introduced a concept of one frame for all, so the same frame can accommodate different plate series.

Your benefits:

- Flexibility: if the requirements change, simply change the plate pack to another series, but the frame can stay the same. Lower cost for adaptations (lower invest and piping remains the same)
- ► Tailor-made solutions. precise design for your heat transfer task, in single and multi-stage design available

Our frame technology helps you to save on your investment and operating costs. By continuous standardization and modular design, we are keeping the frame cost – and your investment - low. At the same time, we focus on service and a maintenance- friendly design (e.g. replacing welded design by bolted whenever possible to facilitate the replacement of frame parts) to keep your service and operating costs down. Our optimized frame design shows our years of experience in building pressure vessels, considering cutting edge technologies such as FEA. Keeping costs low and meeting national/international standards at the same time are not contradictory to us.

Generally, we build frames that comply with the requirements of either the European or the American standards for pressure equipment – ASME Code and Pressure Equipment Directive (PED) with AD2000 or DIN EN 13445, but units can also be built under consideration of other codes and standards, such as API.

At Kelvion, we offer frames suitable for a wide range of applications. Whether you need equipment with hygienic design e.g. for food and beverage or to operate under rough conditions such as wind or snow or in earthquake regions, Kelvion can provide you with the right frame in either sanitary or industrial design.

INDUSTRIAL DESIGN

- Frame parts in carbon steel with protective coating, galvanized tightening bolts
- Industrial connections such as threaded connections, rubber or metal inserts or welding neck flanges to connect piping
- ► Low temperature design possible (down to -50°C)



CD TYPE

Available for both, industrial and sanitary design.

- Compact design
- ► Ideal for limited space requirements
- ► For low amounts of plates



SANITARY DESIGN

- Frame parts either solid stainless steel or cladded with stainless steel, stainless steel bolts
- Stainless steel welding neck flanges, threaded connections or other connections meet your requirements regarding hygienic design.
- Reduced number of tightening bolts for quicker opening and closing. Cleaning and maintenance-friendly.
- Multi-stage design with intermediate plates with connections possible.



Β ΤΥΡΕ

Available for both, industrial and sanitary design.

- Long frame for long plate packs for large heat duties. Multi-pass configuration
- ► For medium to high counts of plates
- ► Tailor-made for special requirements
- ► Hanging plate system

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Gasketed Plate Heat Exchangers

SELECTING THE **RIGHT PLATE SERIES**

SERIES	TECHNICAL DETAILS				DESIGN ADVANTAGES				
	Characteristics	Corru- gation	Gap Size	Available Plate Materials	High Heat Transfer	Low Pressure Drop	Max. Pressure	High Media Viscosity	Media with Particles
NT	Allrounder	HB	М	•••	●●○	●●○	●●○	●●○	••0
LWC	Laser Welded Cassette	НВ	М	•••	••0		•••	••0	••0
NX	High Efficiency	НВ	L	••0	•••	•00	•••	•00	•00
NP	High Performance	НВ	L	●00	•••	•00	•••	•00	•00
NH	High Pressure	НВ	М	•••	●●○	●●○	•••	●●○	••0
ND	Double Wall	НВ	М	•00	●●○	●●○	••0	••0	••0
NL	Large Gap	НВ	М	••0	●●○	●●○	••0	●●○	••0
NW	Wide Gap	НВ	н	•00	•00	•••	•00	•••	•••
NF	Free Flow Gap	FF	н	•00	•00	•••	•00	•••	•••
ст	Evaporation Plate	D	М	●00	•00	•••	•00	•••	•••

Ĵ 13 SERIES Heavy Industry Data Food & HVAC Chemicals Beverages Center NT • LWC . NX • • NP NH ND NL NW • NF СТ

HB: Herringbone | FF: Free Flow | D: Dimple | H: High | M: Medium | L: Low

HIGHLIGHTS N-SERIES

Whatever plate series you choose, you can benefit from the following features, common to all our N-Series plates.





Kelvion's exclusive plate corrugation pattern allows flow to be distributed evenly across the entire plate surface, thereby maximizing heat transfer while minimizing fouling rates, plate count, and cost.





Kelvion gaskets work in perfect combination with our plates to ensure worry free operation. Our chamfered opening allows each gasket to settle into position and also prevents the lock tab from being severed. Gaskets can be easily installed without tools or adhesive and self-seat during closing. It takes just seconds to replace a gasket, making maintenance quick and easy.





allows the GPHE plates to self-align and tightly seal every time the unit is closed. This feature virtually eliminates plate pack snaking, even if the frame is out of alignment and after repeated servicing. This distinctive feature provides you with years of stress-free maintenance and operation.



Kelvion's trademarked PosLoc plate design





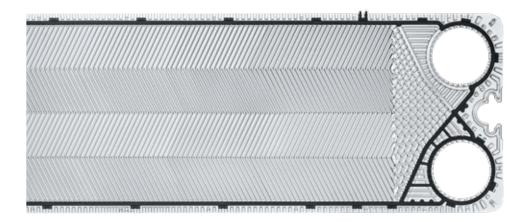
Even if the medium or requirement changes, there is no greater flexibility. All of the N-Series plates can be used in the same frame with varying numbers of plates.

PERATING ARTNERS P

NT PLATE SERIES ALL-ROUNDER FOR ALL APPLICATIONS

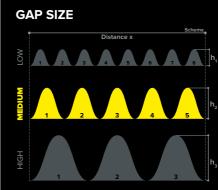
Our NT series marks the beginning of the **N**ew **T**echnology plate concept.

Being our most flexible and universal plate series, NT plates are a good fit for nearly all requirements.



YOUR BENEFITS

- ► Extensive range of plate materials
- ► Largest choice of gasket materials with high temperature resistance, good chemical resistance or food approval
- ► Widest range of plate sizes
- ► Good performance at good price
- and short delivery time



LWC PLATE SERIES FOR CRITICAL MEDIA

Our Laser Welded Cassette series combines the advantages of welded and gasketed plate heat exchangers: easily accessible gasketed flow channels for one medium.

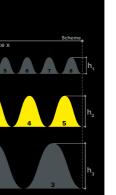


YOUR BENEFITS

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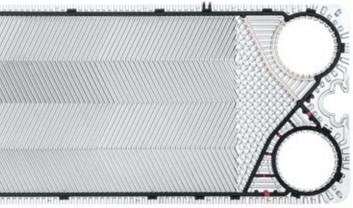
- ▶ 100% separate flow channels, making applications with aggressive media feasible
- ► Laser-welded flow channels for high process reliability
- ► High pressure resistance on welded side
- Cleaning access from gasketed side

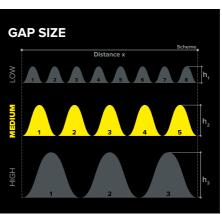
GAP SIZE



INDUSTRIES





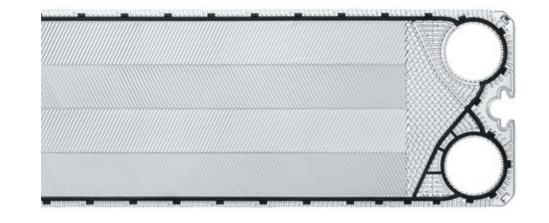


INDUSTRIES



NX PLATE SERIES FOR HIGH EFFICIENCY

This New eXtra narrow gap series has been especially developed for high-performance district heating and cooling systems, which require minimal temperature differences, highest NTU values, more efficiency and maximum pressure restistance.



NH PLATE SERIES FOR HIGH PRESSURE

The New High pressure plate series with its adapted herringbone design combines high pressure resistance with the availability of specific plate material. Thus, it is the first choice for demanding applications e.g. in the oil&gas or chemical industries.

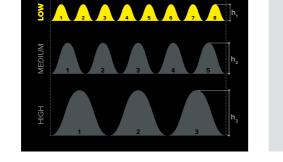
YOUR BENEFITS

- ► Available in titanium or special materials, such as SMO 254 and C-276
- ▶ Pressure resistance up to 36 bar(g) test thanks to adapted design of wave field and gasket.

GAP SIZE

YOUR BENEFITS

Suitable for demanding heat transfer tasks with: · Close temperature approach between the two fluids (1°C) or · Large temperature difference between inlet and outlet ► Increased pressure resistance



GAP SIZE

GAP SIZE



NP PLATE SERIES FOR HIGHEST PERFORMANCE

Our New high Performance series takes heat transfer to the next level. With highest efficiency, in combination with high pressure resistance, it is the solution for cold supply in data centers or high-rise buildings. It withstands an extremely high test pressure of up to 42 bar(g).

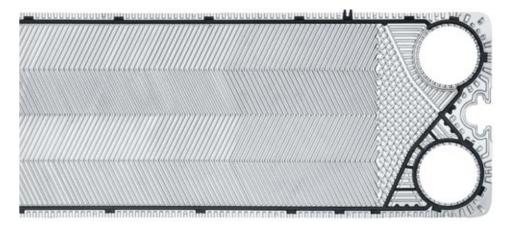
YOUR BENEFITS

- Perfect fit for extremely low temperature differences between the two media
- ► For high NTU values
- ► With test pressures up to 42 bar(g) for most demanding applications

INDUSTRIES (j (j)

ND PLATE SERIES FOR HIGHEST SAFETY

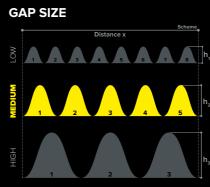
With the New Double-wall we have developed an extremely reliable variant of gasketed plate heat exchangers. Two especially thin plates, which are welded together at the port hole, create a narrow leakage gap within a double wall.

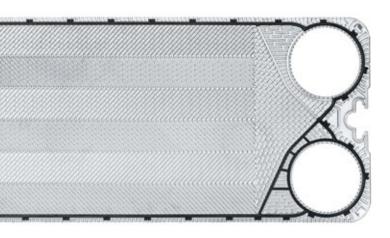


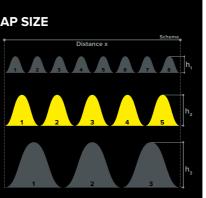
YOUR BENEFITS

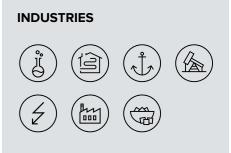
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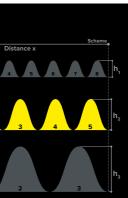
- ► High production security with low risk of intermixture of media
- ► This clever solution ensures that in case of a plate rupture this is indicated and incompatible media remain separated
- ► ND meets regulations for portable water applications on and off shore











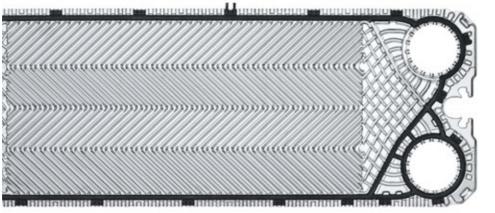
INDUSTRIES





NL PLATE SERIES FOR HIGH-VISCOUS AND SHEAR SENSITIVE MEDIA

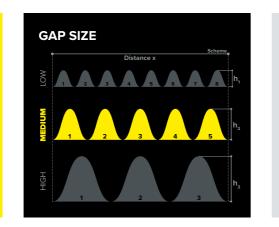
The New Large gap series offers a deeper corrugation depth/plate gap above 4 mm for gentle and uniform treatment of sensitive products.



INDUSTRIES

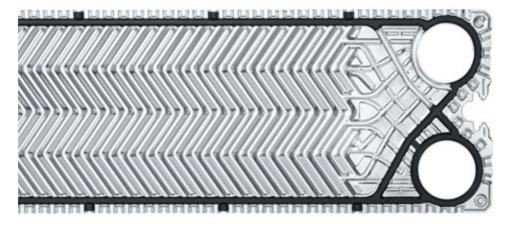
YOUR BENEFITS

- Long service life as blockages are reduced to a minimum
- Ideal for fluids with higher viscosity, as well as shear-sensitive media such as dairy products, food and beverages
- Pressure resistance runs up to 25 bar (g)



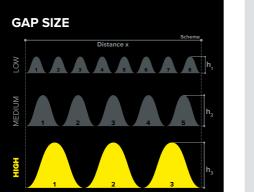


The New Wide gap plate series offers a herringbone gap up to 10mm and thus blockage-free operation even for media containing solids and particles.

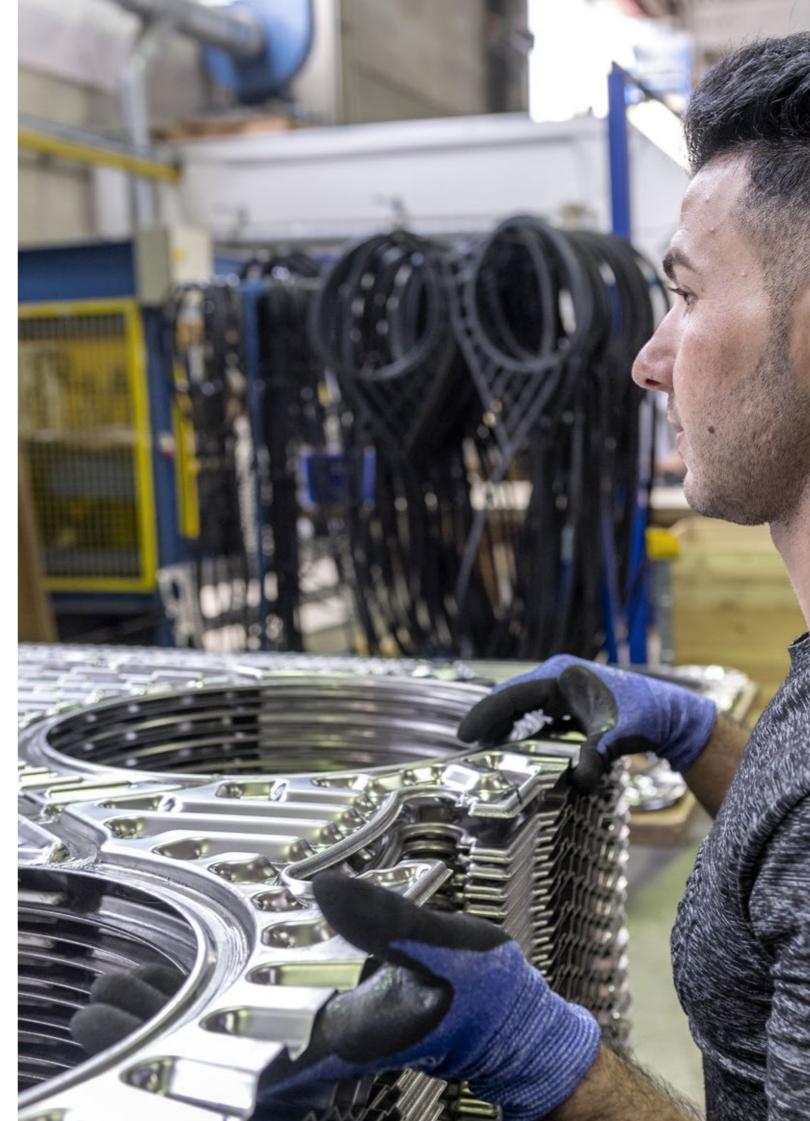


YOUR BENEFITS

- Longer service life, lower operating cost
- Turbulence promotes the self-cleaning effect
- Minimal pressure loss, even with viscous media
- Increased pressure resistance compared to a free flow plate







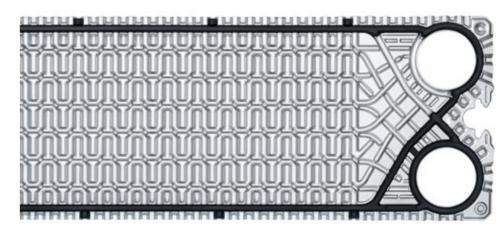


NF PLATE SERIES FREE FLOW FOR FIBRES AND PARTICLES

Our New Free flow series with special wash board corrugation is ideally suited to media that contain fibres and solids.

It is recommended for applications e.g. in the sugar and paper industries that go beyond the capabilities of conventional herringbone plate heat exchangers.

The space between the plates measures up to 12 mm.



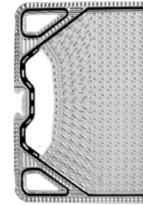
YOUR BENEFITS

- ► Blockage-free operation thanks to flow channels with a constant width of 5 or 10mm
- Alternative to shell-and-tube and spiral heat exchangers, thanks to smaller investment, operating costs and space requirements.
- ► Suitable for applications involving media containing fibres and solids

GAP SIZE

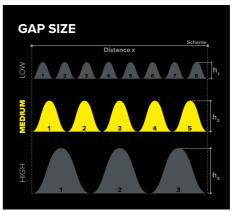
CT PLATE SERIES FOR EVAPORATION DUTIES

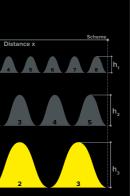
The **C**onci**T**herm series provides optimized dimple plate structure for high performance in rising-film evaporators, often used in the sugar industry or for boosters in combination with conventional tube-type evaporators.



YOUR BENEFITS

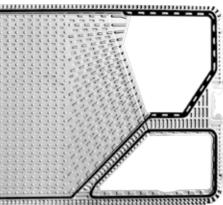
- ► Wide plate gap for reduced pressure loss compared to herringbone corrugation
- ▶ 1.5 m² heat exchanger surfaces per plate enable high evaporator output
- ► No clogging and easy cleaning
- Compact design and low hold-up volume
- Individual connection design





INDUSTRIES





INDUSTRIES



Gasketed Plate Heat Exchangers

DSTANDA

Many Codes and Standards can be offered

- Local frame production for local codes and standards Certification by inspection authorities (e.g. TÜV), Marine classification societies (e.g. DNV-GL).
- ► ASME U-Stamp
- ► Industry standards (e.g. API)
- ► 3A Sanitary standard
- Certification (e.g. ISO9001)

PERFORMANCE WITH AHRI CERTIFIED PLATES

Looking for the additional security of third-party verified performance? - You will find it with Kelvion Gasketed Plate Heat Exchangers. Certified by AHRI (the Air-Conditioning, Heating, and Refrigeration Institute), they are well suited for water, sea water HVAC or glycol applications.

Across the globe, regulators increasingly depend on AHRI for accurate and unbiased evaluation of heating, air conditioning, water heating, and commercial refrigeration equipment. The association's certification programs demonstrate to government, building owners, and homeowners that equipment performance claims have been independently measured and verified, instilling consumer confidence and enabling fair product comparisons.

This allows buyers to evaluate and make a fair comparison when selecting products for their installations. As our customer, you can feel assured that the Kelvion Gasketed Plate Heat Exchanger range delivers the performance you need, and providing a reliable, efficient solution.

The NA, NC, NQ or NG series gasketed plate heat exchangers are independently certified by the AHRI through AHRI Standard 400. This series supports the entire range of temperatures and pressures for HVAC applications and offers a wide selection of plate, gasket and port connection options. Belonging to our N-Series, you can benefit from all the advantages PosLoc, EcoLoc, OptiWave and one frame for all.



Globally Recognized. Industry Respected.

Gasketed Plate Heat Exchangers | Lean Line

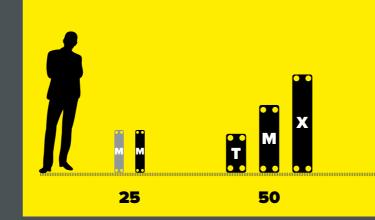
STANDARDIZED UNITS AVAILABLE WITHIN 5 DAYS

With a clear focus on standardized HVAC and industrial heating and cooling applications, the Lean Line range of gasketed plate heat exchangers offers fast delivery and low first cost in combination with our proven Kelvion quality.

Kelvion's gasketed plate heat exchangers are expertly engineered and manufactured for peak performance. We deliver tailor-made solutions for standardized cooling applications providing a rapid availability. Our Lean Line range of gasketed plate heat exchangers are available with stainless steel plates, NBR gaskets and a standard frame configuration.

As we carry out a thermodynamic and hydraulic design of each lean line heat exchanger, customers will receive their product solution with maximum precision, meeting exactly process requirements such as temperature profile and pressure drop.

PORTFOLIO LEAN LINE

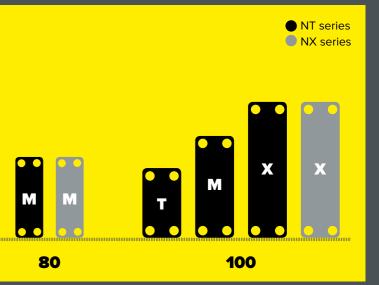


APPLICATIONS LEAN LINE

HVAC

- District heating
- ► District cooling
- ► Heating & cooling of buildings
- ► Air conditioning
- ▶ Potable water heating
- ► Swimming pool heating
- ► Heat pumps
- ► Solarthermal heating





INDUSTRIAL HEATING/COOLING

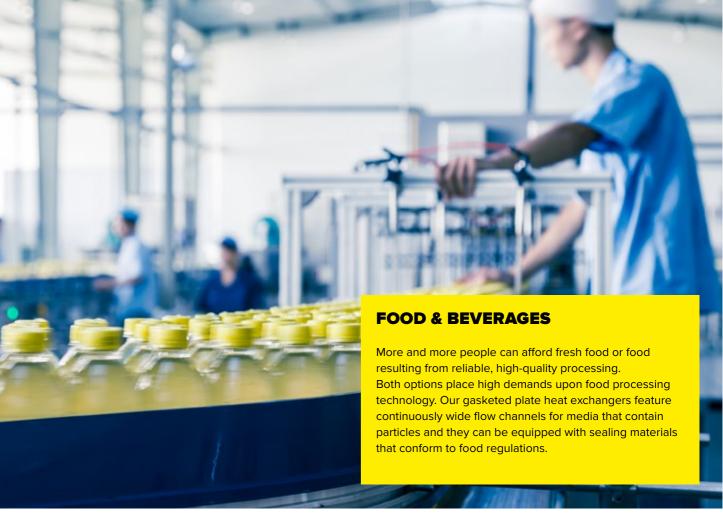
- ► General industrial cooling applications
- ► Fast replacement solution
- ► Surface treatment
- ► Cooling of machine oil
- ► Cooling of grinder coolant
- ► Cooling of hydraulic oil
- Combined heat & power systems

KEY APPLICATION EXAMPLES

CHEMICALS

Chemical production involves a complex series of processes, from heating, cooling and condensing to evaporation and separation.

All of these need reliable heat exchange technology, which is where Kelvion comes in. Our wide range of heat exchangers and variety of materials allows us to provide the right solution for almost every application in the chemical industry.





DATA CENTER

Gasketed plate heat exchangers for data center cooling applications require peak performance in terms of heat transfer. The Kelvion plate heat exchanger the Kelvion plate heat exchanger series NP and NX are is tailored to meet these requirements, thanks to an extremely shallow plate gap and a smaller pitch. These attributes ensure highly turbulent flow and, in turn, a good heat transfer at very small temperature differences.