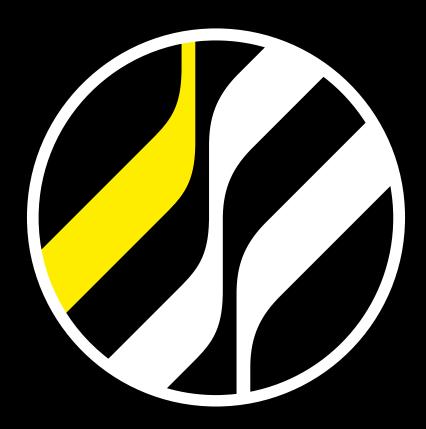


Product Line: Gasketed Plate Heat Exchangers

QUALITY AND FLEXIBILITY AT ITS BEST



Kelvion



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.

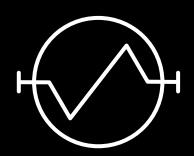
Kelvion – Experts in Heat Exchange.

KELVION – A TRIBUTE **TO LORD KELVIN** (1824 - 1907)



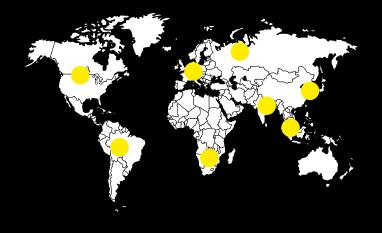
Lord Kelvin formulated the laws of thermodynamics and absolute units of temperature are stated in kelvin, in his honor.

OUR LOGO - INSPIRED FROM THE SCHEMATIC **FOR HEAT EXCHANGER**





67 BRANCHES AND SALES PARTNERS WORLDWIDE



5,000 EMPLOYEES WORLDWIDE



YOUR MARKETS ARE **OUR MARKETS**



Chemicals Data Center







Food & Beverage





Refrigeration

Marine

Oil & Gas

Power





... and more

KELVION HAS A LONG HISTORY

With the new name, the former GEA Heat Exchangers is writing its own history as Kelvion.

GEA sells the Heat Exchangers
Segment to Triton.

Reorganization of GEA's 9 Divisions into technologically distinct Segments. The largest segment is the Heat Exchangers Segment.

In April 1999, GEA was acquired by mg technologies AG

Foundation of GEA in Bochum by Otto Happel sen. (Born 1882)

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.

GASKETEDPLATE 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

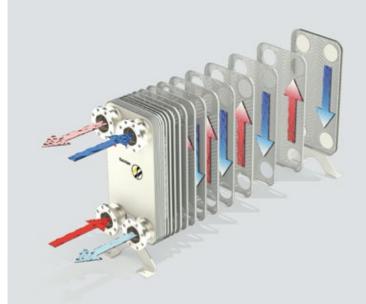




BRAZEDPLATE HEAT EXCHANGERS

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.

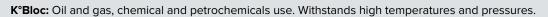
- ▶ Tailor-made economical design for the most varied applications
- ▶ Long lifetime
- ► Highest efficiency
- ▶ Highest quality

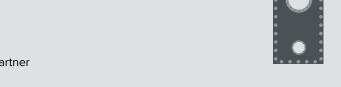


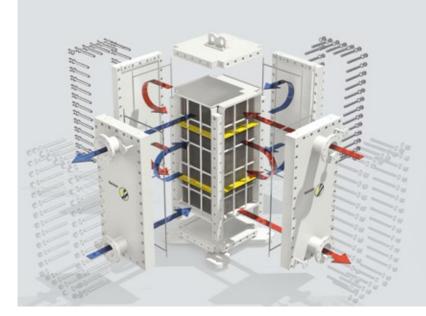


WELDEDPLATE HEAT EXCHANGERS

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.











APPLICATIONS



Chemicals



Data Center



Food & Beverages



Heavy Industry



HVAC



Marine



Oil & Gas



D -----



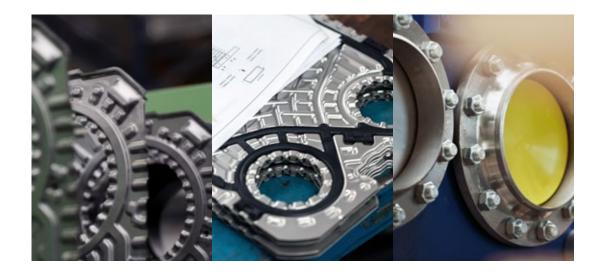
Refrigeration



on Suga

Gasketed Plate Heat Exchangers

LEADING TECHNOLOGY FOR ALL APPLICATIONS

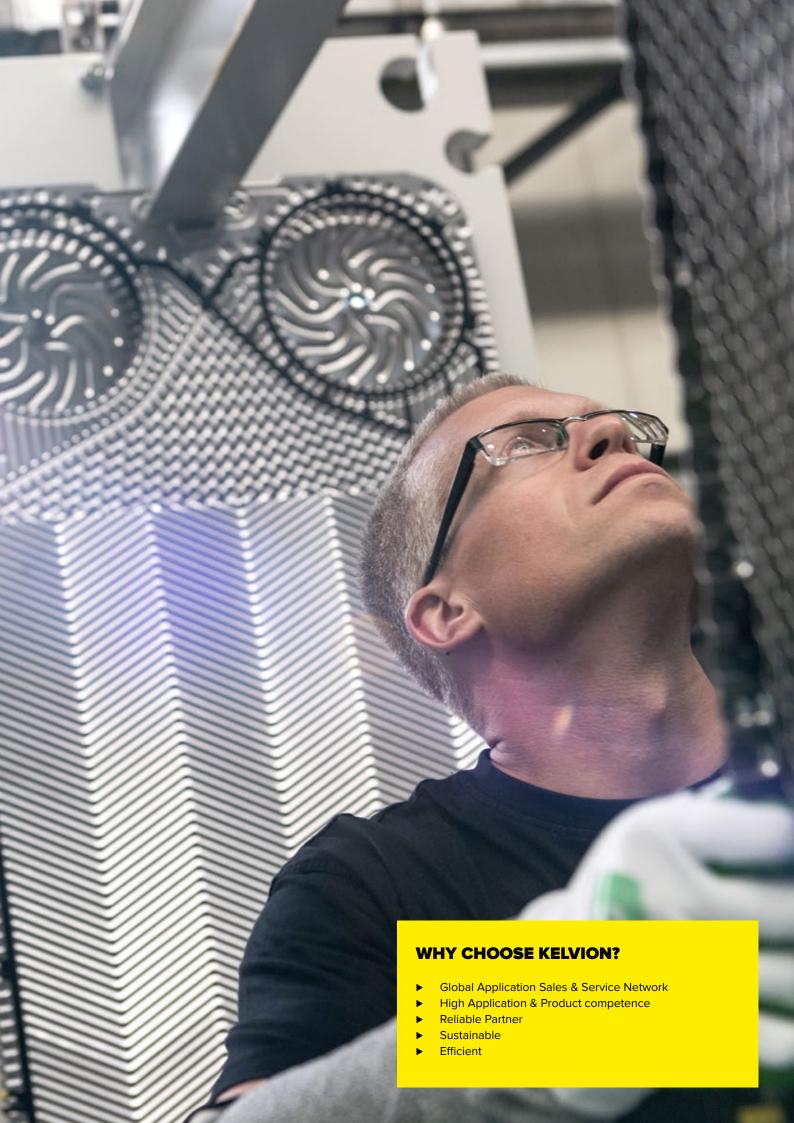


Your global Partner providing all Industries with trusted Plate Heat Exchanger Technology and Service where Expertise is needed. Reliable. Sustainable. Efficient.

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.

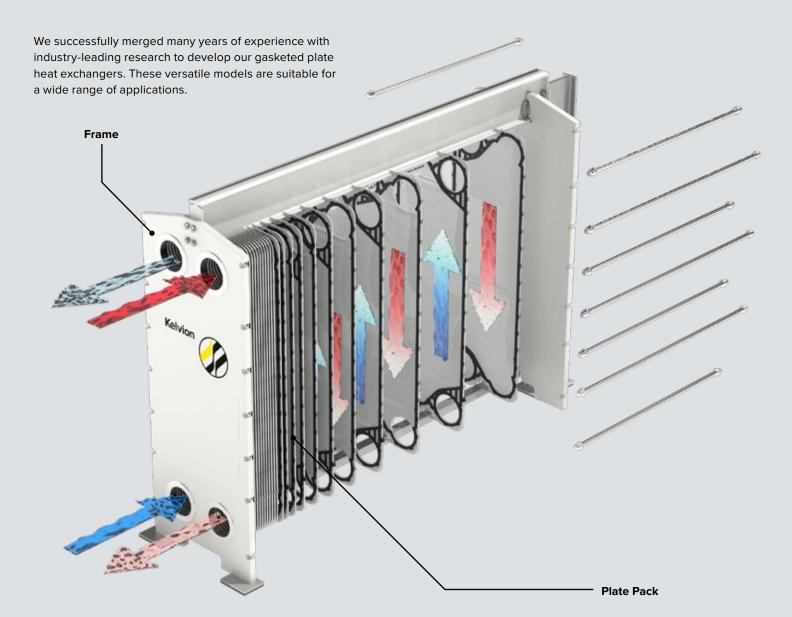
The range of plate corrugations and plate lengths enables them to be made to measure to your requirements.

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



Gasketed Plate Heat Exchangers

QUALITY AND FLEXIBILITY



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 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

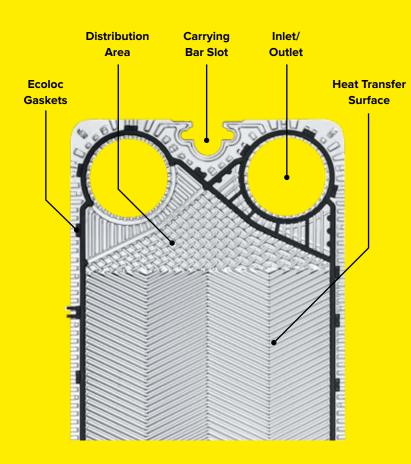


PLATE MATERIAL

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

1.4547 / 254SMO C276

Nickel 201

▶ Titanium

Titanium

Titanium Palladium

Other materials on request.

Material selection influences the pressure resistance.

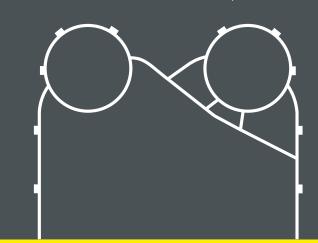
GASKET MATERIAL

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)

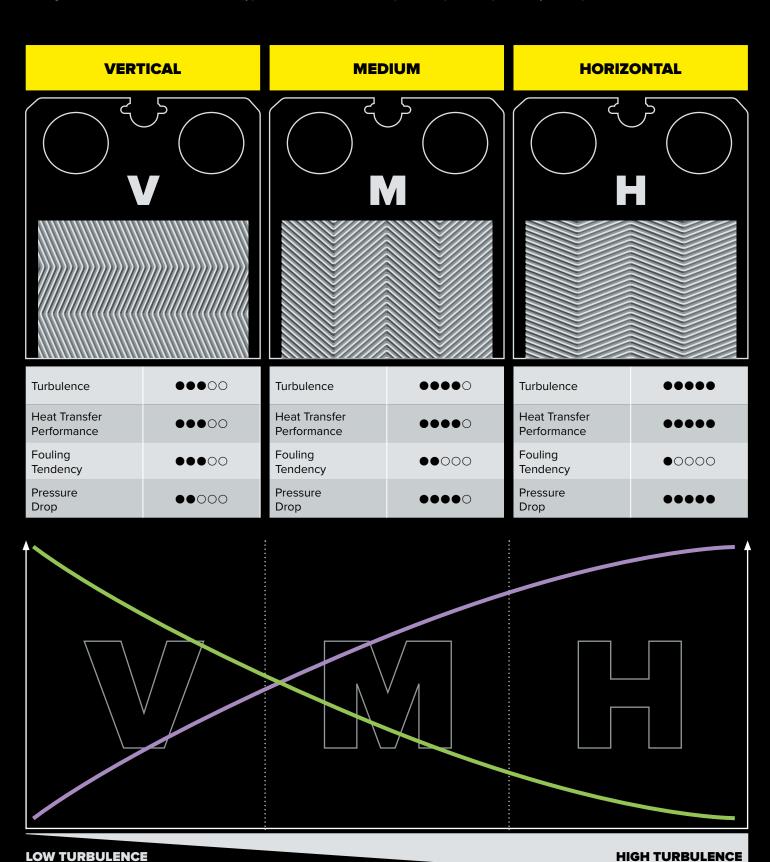
Gasket material limits the allowable temperature.



CORRUGATION TYPES

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

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



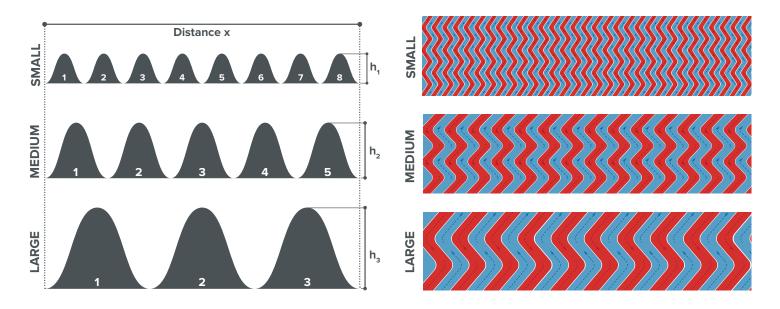
		SELF CLEANING			INVESTMENT		FOOTPRINT	FOULING
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GAP SIZE

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.

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.



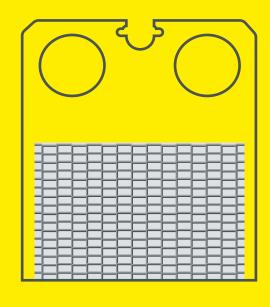


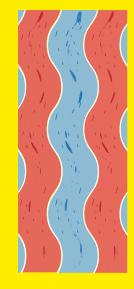
FREE FLOW

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.







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.



B TYPE

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



SELECTING THE RIGHT PLATE SERIES

SERIES	TE	CHNICAL D	ETAILS		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	НВ	М	•••	••0	••0	••0	••0	••0	
LWC	Laser Welded Cassette	НВ	М	•••	••0	••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	••0	•••	••0	••0	
ND	Double Wall	НВ	М	•00	••0	••0	••0	••0	••0	
NL	Large Gap	НВ	М	••0	••0	••0	••0	••0	••0	
NW	Wide Gap	НВ	Н	•00	•00	•••	•00	•••	•••	
NF	Free Flow Gap	FF	Н	•00	•00	•••	•00	•••	•••	

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.

SERIES	000		T _B					4		(S)
	Chemicals	Data Center	Food & Beverages	Heavy Industry	HVAC	Marine	Oil & Gas	Power	Refrigera- tion	Sugar
NT	•	•	•	•	•	•	•	•	•	•
LWC	•	•	•		•	•	•	•	•	
NX	•	•	•	•	•	•	•	•		
NP	•	•		•	•		•	•		
NH	•	•		•	•	•	•	•		•
ND	•	•	•	•	•	•		•		
NL	•		•	•		•	•			•
NW	•		•							•
NF	•		•							•

ECOLOCGASKETS



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.





Kelvion's trademarked PosLoc plate design 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.





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.

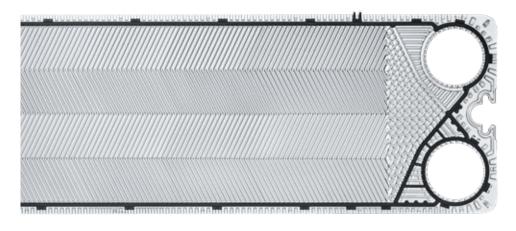


NT PLATE SERIES

ALL-ROUNDER FOR ALL APPLICATIONS

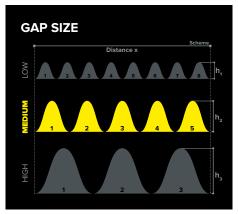
Our NT series marks the beginning of the **N**ew **T**echnology plate concept.

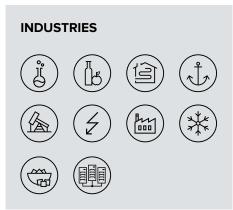
Being our most flexible and universal plate series, NT plates are a good fit for nearly all requirements.



YOUR BENEFITS

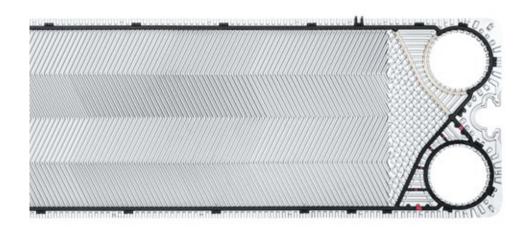
- ► Extensive range of plate materials
- ► Largest choice of gasket materials with high temperature resistance, good chemical resistance or food approval
- ► Widest range of plate sizes
- ► Good performance at good price and short delivery time



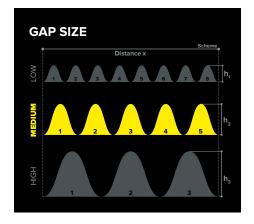


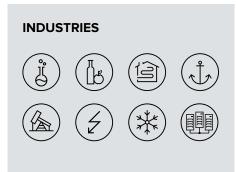
LWC PLATE SERIESFOR CRITICAL MEDIA

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



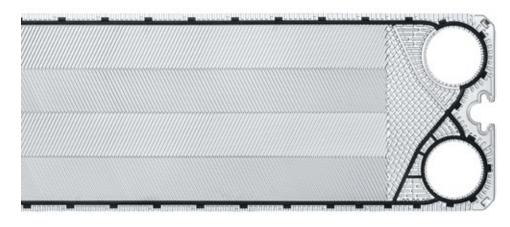
- ► 100% separate flow channels, making applications with aggressive media feasible
- ► Laser-welded flow channels for high process reliability
- ► High pressure resistance on welded side
- ► Cleaning access from gasketed side





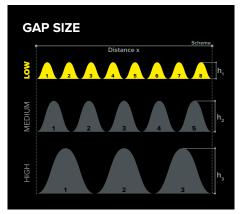
NX PLATE SERIES FOR HIGH EFFICIENCY

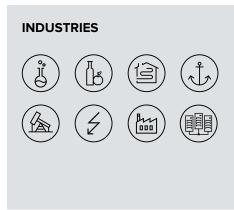
This **N**ew e**X**tra narrow gap series has been especially developed for high-performance district heating and cooling systems, which require minimal temperature differences, highest NTU values, more efficiency and maximum pressure restistance.



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

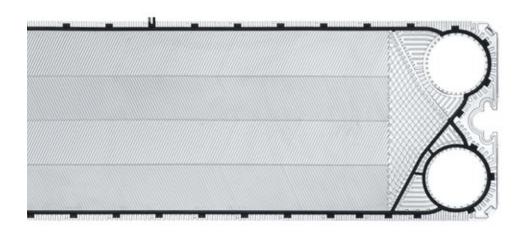




NP PLATE SERIES

FOR HIGHEST PERFORMANCE

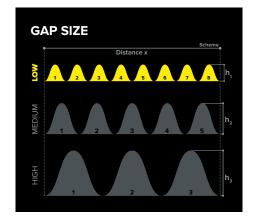
Our **N**ew high **P**erformance series takes heat transfer to the next level. With highest efficiency, in combination with high pressure resistance, it is the solution for cold supply in data centers or high-rise buildings. It withstands an extremely high test

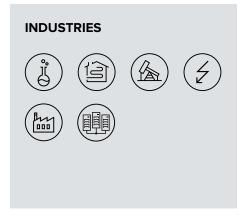


YOUR BENEFITS

pressure of up to 42 bar(g).

- ➤ 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

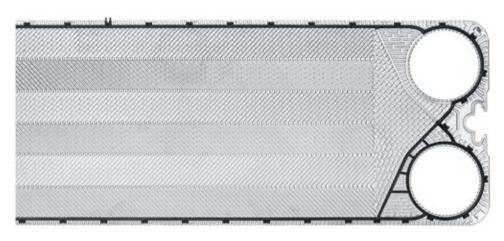




NH PLATE SERIES

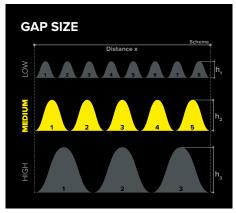
FOR HIGH PRESSURE

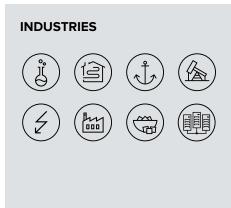
The **N**ew **H**igh pressure plate series with its adapted herringbone design combines high pressure resistance with the availability of specific plate material. Thus, it is the first choice for demanding applications e.g. in the oil&gas or chemical industries.



YOUR BENEFITS

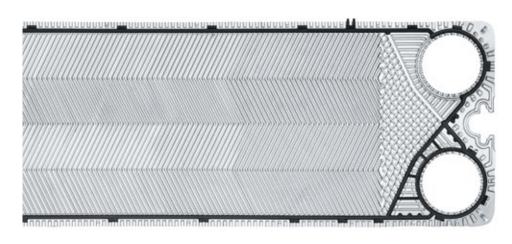
- ➤ Available in titanium or special materials, such as SMO 254 and C-276
- ➤ Pressure resistance up to 36 bar(g) test thanks to adapted design of wave field and gasket.



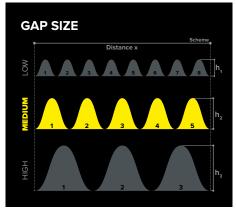


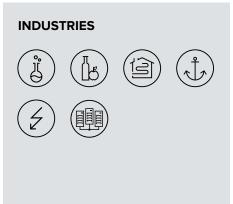
ND PLATE SERIES FOR HIGHEST SAFETY

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.



- ► 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 potable water applications on and off shore

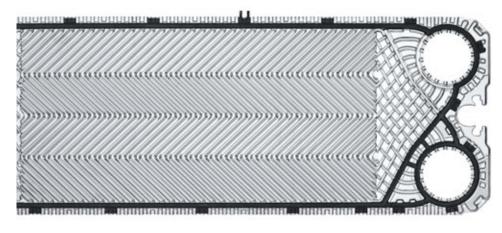




NL PLATE SERIES

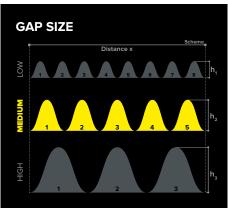
FOR HIGH-VISCOUS AND SHEAR SENSITIVE MEDIA

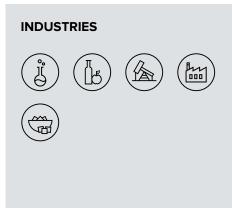
The **N**ew **L**arge gap series offers a deeper corrugation depth/plate gap above 4 mm for gentle and uniform treatment of sensitive products.



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)

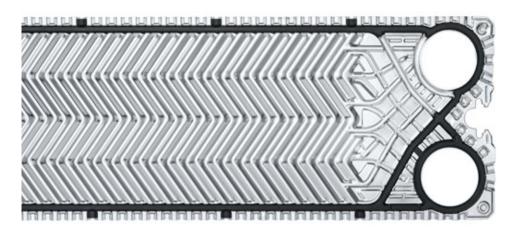




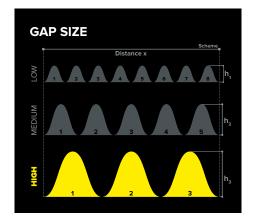
NW PLATE SERIES

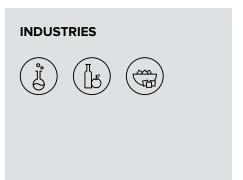
IDEAL FOR SOLIDS AND PARTICLES

The **N**ew **W**ide gap plate series offers a herringbone gap up to 10mm and thus blockage-free operation even for media containing solids and particles.

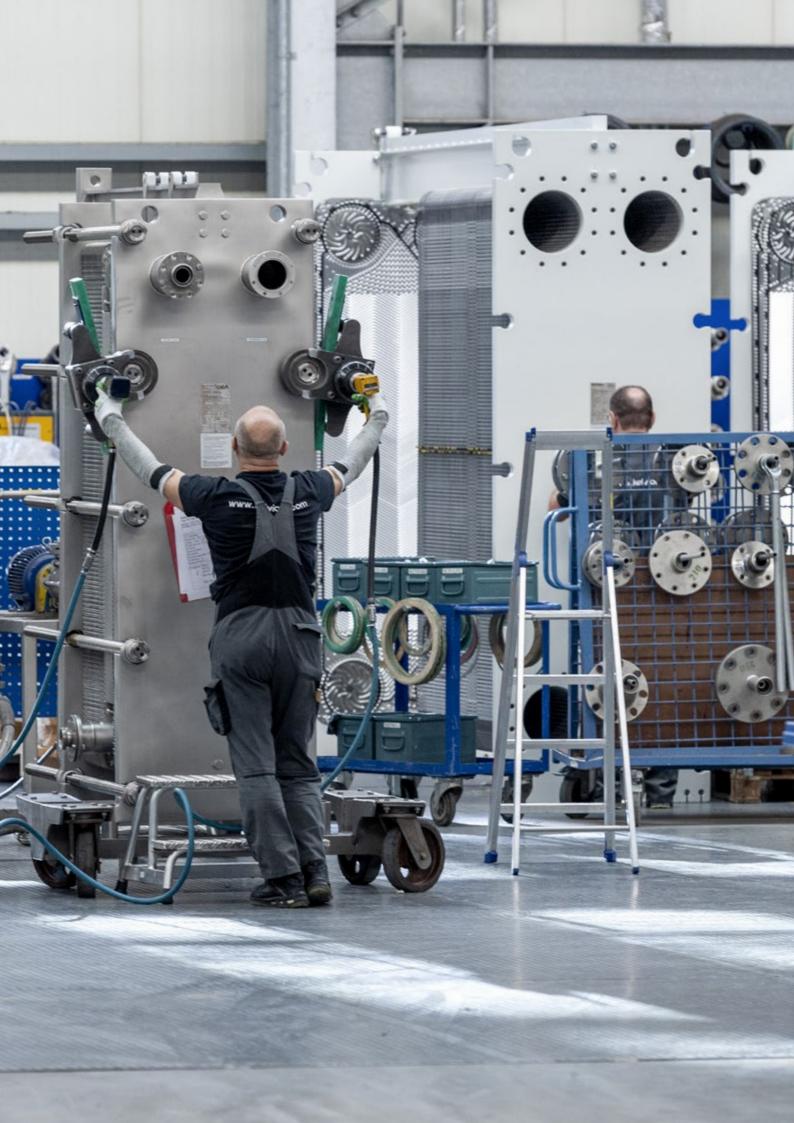


- ► Longer service life, lower operating cost
- ► Turbulence promotes the self-cleaning effect
- ► Minimal pressure loss, even with viscous media
- ► Increased pressure resistance compared to a free flow plate









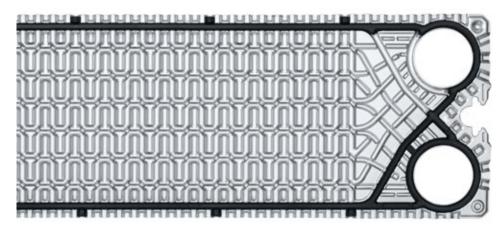
NF PLATE SERIES

FREE FLOW FOR FIBRES AND PARTICLES

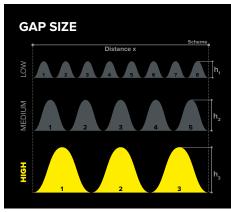
Our **N**ew **F**ree flow series with special wash board corrugation is ideally suited to media that contain fibres and solids.

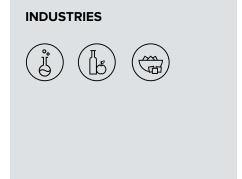
It is recommended for applications e.g. in the sugar and paper industries that go beyond the capabilities of conventional herringbone plate heat exchangers.

The space between the plates measures up to 10 mm.



- ► 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







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.

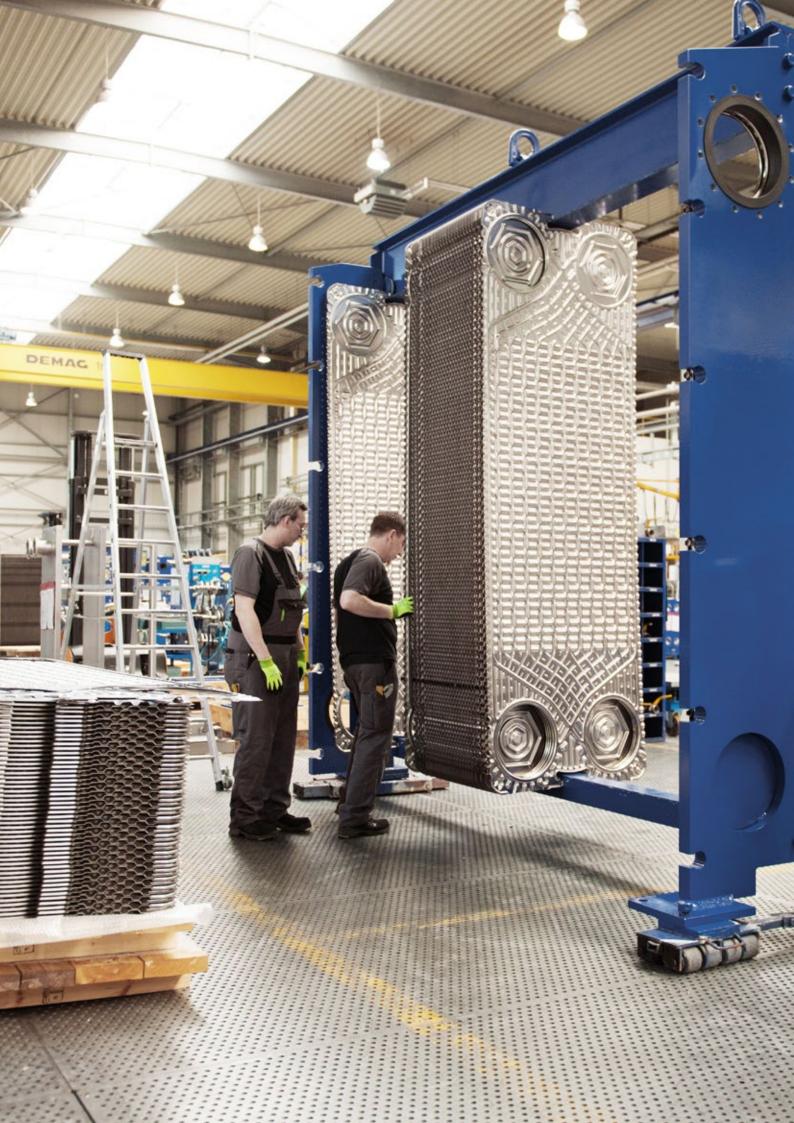
Across the globe, regulators increasingly depend on AHRI for accurate and unbiased evaluation of heating, air conditioning, water heating, and commercial refrigeration equipment. The association's certification programs demonstrate to government, building owners, and homeowners that equipment performance 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.

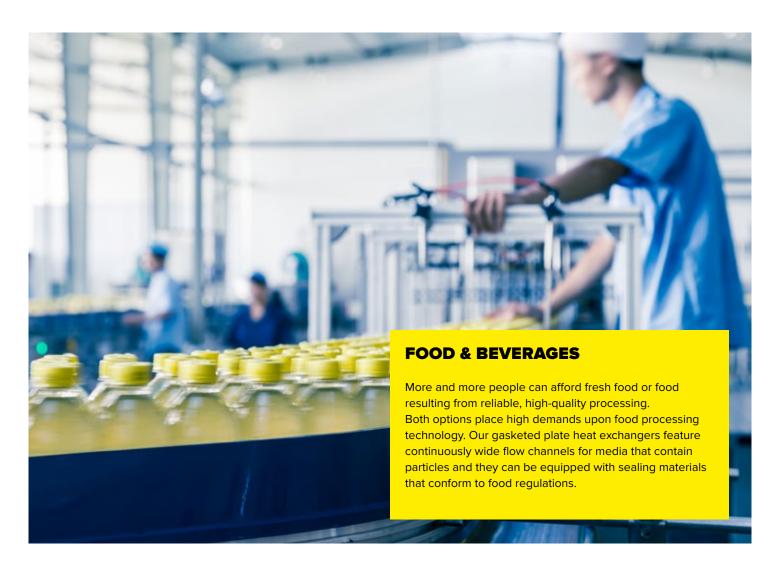


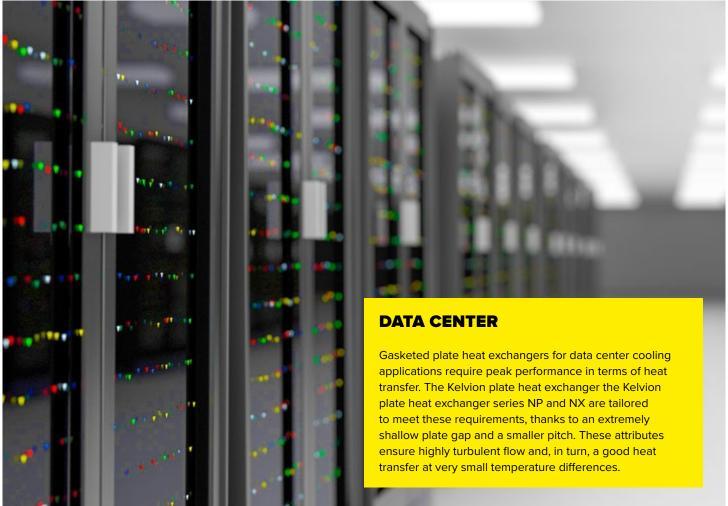
Globally Recognized. Industry Respected.

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.













START-UP & ONSITE SERVICES

We ensure that our products are delivered safely and are fully validated to give a robust and reliable performance over as long a life cycle as possible.

And should you encounter an issue with your equipment after it is fully commissioned, our team of experienced Field Service technicians is at your disposal to come to your site to investigate and correct any malfunctions.

- ► Pre-commissioning supervision
- ▶ Commissioning supervision



REPAIRS, OVERHAULS & MAINTENANCE

Unscheduled downtime can be disastrous.
That is why our trained engineers are ready to respond quickly in case of an emergency, and review and repair components while keeping any disruption to your production to a minimum.
Any overhaul work is carried out quality-oriented in our service centers or on your site with the supervision of our qualified staff.

Regular inspections and maintenance help to reduce costs, extend the lifetime of your Kelvion products and achieve reliable performance.

- ▶ Cleaning services
- ▶ Reconditioning
- ▶ Repair
- ▶ Spare parts



MONITORING, CONSULTING & TRAINING

Knowledge of the equipment's condition allows you to secure reliable production, improve safety and energy efficiency, increase equipment lifetime and prevent breakdowns. We offer consultancy services that take into account the special features of your process, making use of our profound design knowledge of heat exchange equipment. And we work closely with you to develop the exact solution that is best tailored to your needs.

- ▶ Remote support
- ► Technical documentation
- ▶ Training
- ▶ Troubleshooting
- ► Maintenance tools
- ▶ Condition audit
- ▶ Performance audit



UPGRADES & REPLACEMENTS

We replace components to keep our heat exchangers running smoothly and to prevent downtime. Where parts or components have become obsolete due to age, we will suggest a suitable upgrade. In these cases, we can often also suggest new, state-of-the art technology which additionally enhances the performance and reliability of your process.

- ▶ Equipment upgrades
- ▶ Redesign
- ► Replacement and retrofit

ALL BRAND SERVICE

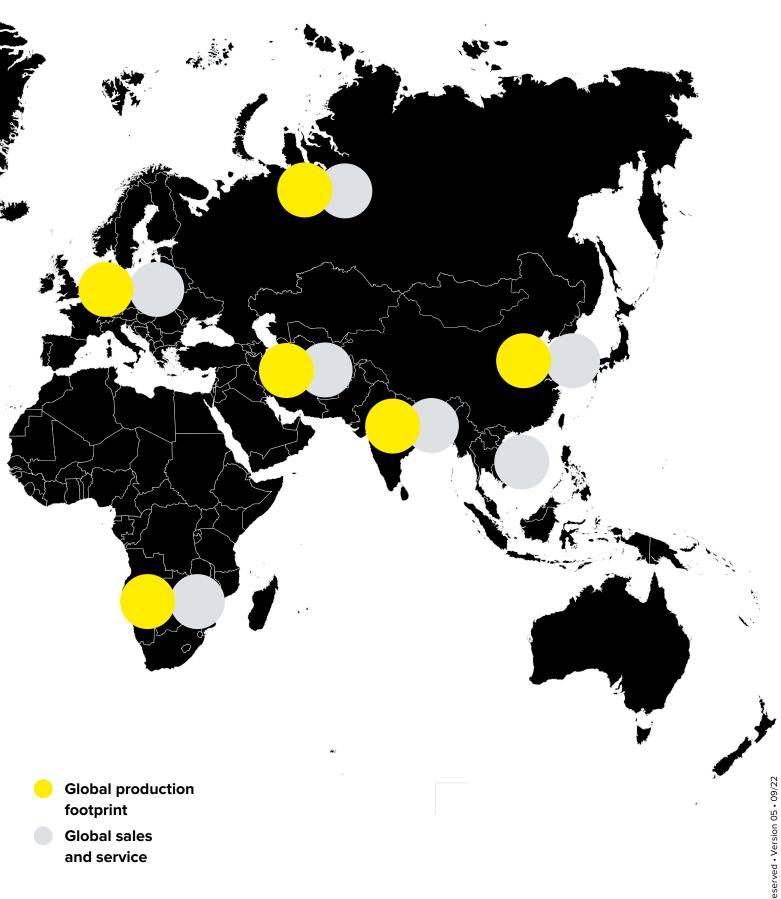
Besides being experts in our own products and our former brands, we also have the expertise to service other brands.

PERFORMANCE AGREEMENTS

We offer individually tailored service solutions for the services in our extensive portfolio. They maximize your return on investment, ensure continual performance excellence and make budgeting simpler.



No matter where your market is, regardless of country, we are never far away. We are always happy to answer any questions you may have and meet your requirements. Even the largest, most successful project begins with an initial, profitable conversation. We look forward to hearing from you.





Just scan this QR code with your smartphone or visit our website at: www.kelvion.com - there you will find a highly competent contact in your immediate vicinity.

www.kelvion.com