General Brochure

*A **Key Player** committed to*
Energy Transition** & **Transformation

NG0-GNRL01ENG-revK

thermowave
Brand of Nexson Group

GROUP Nexson INDUSTRY

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Nexson Group is a French company based in Garchizy in the Nièvre region. Aware of environmental issues, our company helps manufacturers optimize their manufacturing processes by saving energy. Every day, Nexson does more to preserve our natural resources. We provide our customers with concrete solutions to combat energy wastage and its impact on the environment.

80+
COUNTRY COVERAGE

700+
CUSTOMERS IN THE WORLD

4
PRODUCTION SITES

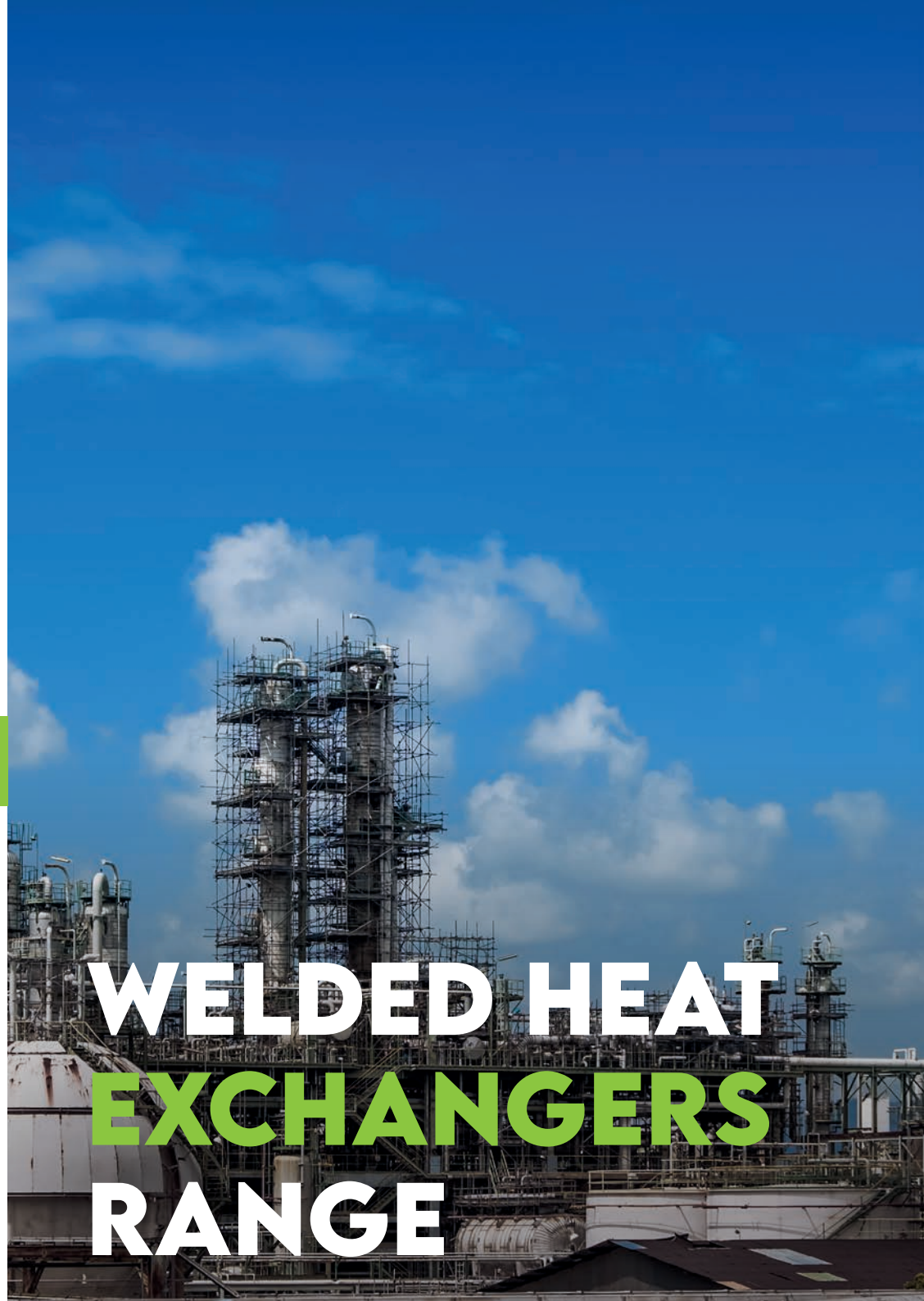
30+ years A quarter-century quality and experience

Sustainable Growth Driven by Innovation and Performance

For more than ten years, the Group has developed mainly through endogenous growth, based on technological innovation, industrial performance and a customer-focused approach to service quality. This dynamic has enabled Nexson Group to establish itself as a key player in its sector on a global scale.

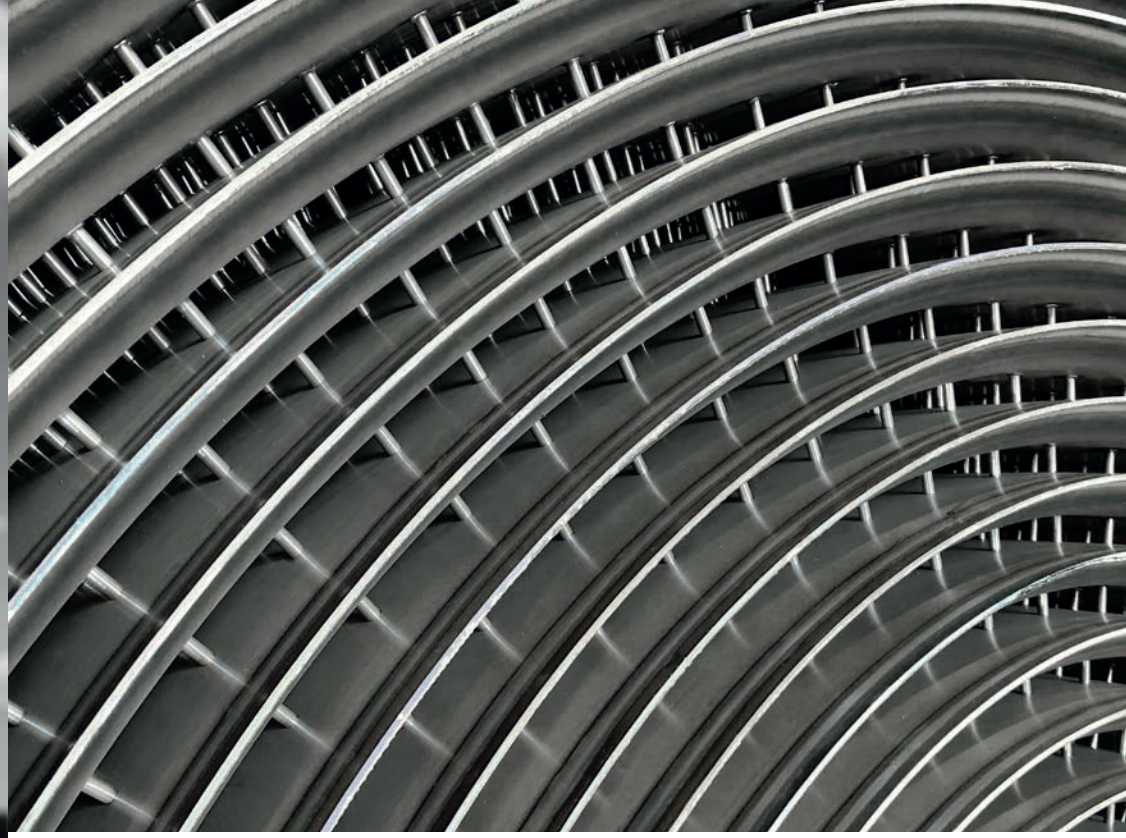
Multidisciplinary Solutions for a Wide Range of Industries

Today, Nexson Group is structured around several complementary areas of activity, with the ambition of offering a complete and coherent range of tailor-made industrial solutions. These solutions are aimed at a wide range of industrial sectors, both in France and internationally, particularly in the chemical, petrochemical, agri-food, energy and other sectors. Thanks to its multidisciplinary expertise, the group is able to support its customers in their most complex projects, providing them with innovative, sustainable and high-performance solutions.



WELDED HEAT EXCHANGERS RANGE

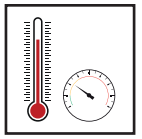
SPIRAL PLATE HEAT EXCHANGERS



SELF-CLEANING

EASY FOR INSPECTION AND CLEANING

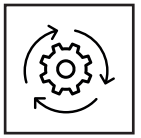
SINGLE CHANNEL



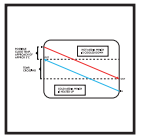
HIGH PRESSURES & TEMPERATURES

HANDLE CORROSIVE/ EROSIVE FOULING MEDIAS

LOW MAINTENANCE COSTS



LOW OPERATING COSTS



ENERGY SAVING

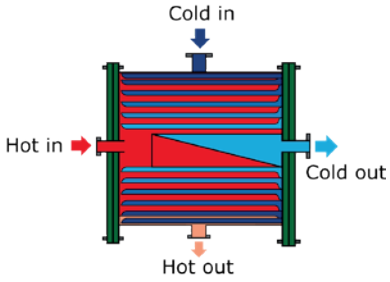
Spiral Plate Heat Exchangers - Liquid to liquid duties

GreenSpiral™ Type 1
LOW PRESSURES

GreenSpiral™ versatile design allows it to handle one or two fouling fluids. Our customized, fit for purpose approach, optimizes the channel spacing vs particle size, and the pressure drop across each channel. The single passage channels facilitates turbulent flows to handle fouling medias and have a self-cleaning effect. Both channels are easy to access for inspection and cleaning. Your alternative to the shell and tube heat exchangers.

GreenSpiral™ Type 1
HIGH PRESSURES

Nexson GreenSpiral™ can handle cycling duties. The robust design allows our heat exchangers to expand without mechanical failures during a pressure or temperature fluctuation. The uniform, precise engineered thermal spiral core design, defined cross section that is combined with turbulent flows, allows the GreenSpiral™ heat exchanger technology to have no dead zones in the channels, maximizing the heat transfer surface. This SPHE model is specifically designed to handle high pressures for tough applications.



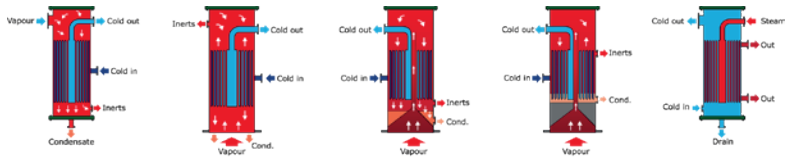
Spiral Plate Heat Exchangers - Biphasic applications

GreenSpiral™ Type 2

Nexson GreenSpiral™ Type 2 heat exchanger is ideal to handle biphasic applications where condensing is required for vapors, with or without inert gases, evaporation of large flows and when low pressure drop is required, such as near vacuum applications. In evaporator or condenser mode, our SPHE offers easy access for inspections and/or mechanical cleaning.

GreenSpiral™ Type 2 Column

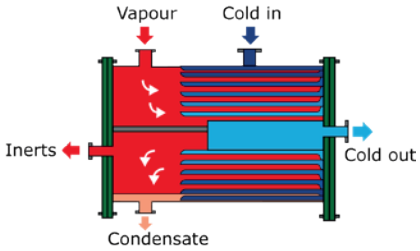
The GreenSpiral™ Type 2 column heat exchanger unique design features can be used for condensing and boiling duties between two gases or a liquid to gas system. Nexson Group's precise engineering capabilities and fit for purpose approach design allow us to build the GreenSpiral ™ Type 2 column with several spiral heat exchangers welded in series, in the same shell to achieve large condensing duties.



Spiral Plate Heat Exchangers

GreenSpiral™ Type 3
STEAM HEATER

GreenSpiral™ Type 3 plate heat exchanger is commonly used to heat a fouling, viscous, tough fluid medias by using steam. The steam circulates in a crossflow manner in a fully opened channel, through the complete width of the unit. If present, our design can allow inert gases to be removed easily. The tough media circulates in a closed spiral channel where the selfcleaning effect mitigates fouling.



GreenSpiral™ Type 1
BB / BW HEAT EXCHANGER

The GreenSpiral™ Type 1 BB/BW (Biosolids/Biosolids and Biosolids/Water) is specifically design to handle highly fouling sludges in the Biogas and Waste Water treatment applications.

GreenSpiral™ Type 1 BB / BW plate heat exchangers are specially designed for digester sludge heating and other heat recovery applications like raw sludge heating and heat recovery from effluents, pasteurization and/or methanisation.

APPLICATIONS

	TYPE 1 LOW PRESSURES	TYPE 1 HIGH PRESSURES	TYPE 2 1 STAGE	TYPE 2 COLUMN	TYPE 3 STEAM HEATER	TYPE 1 BB / BW
OIL & GAS REFINERY	●	●	●	●	●	
PETROCHEMICAL	●	●	●	●	●	
MINING & STEEL	●		●	●	●	
PULP & PAPER	●		●	●	●	
POWER	●		●	●	●	
AGRO INDUSTRY	●		●	●	●	
SEWAGE						●

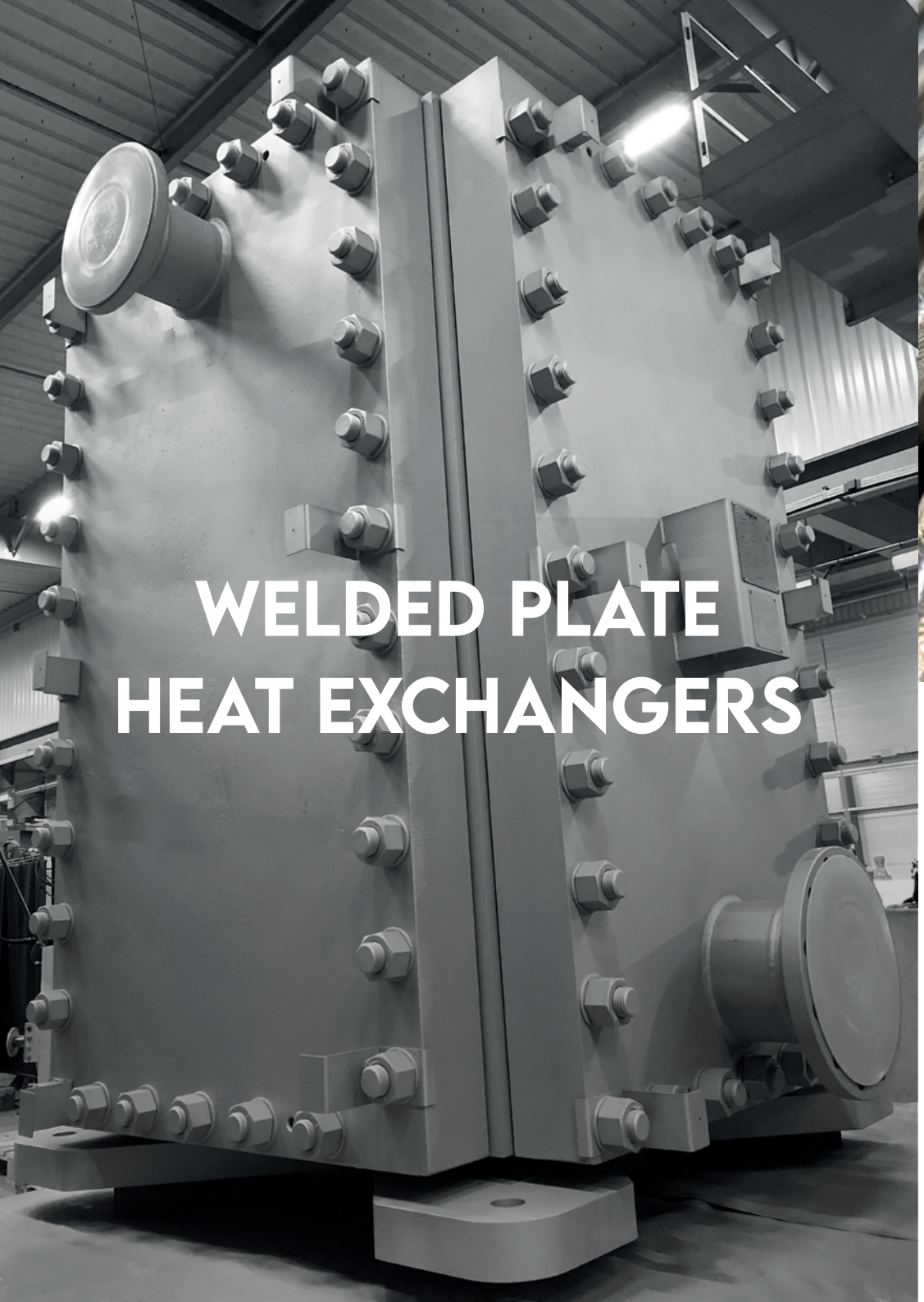
TECHNICAL DATA

	TYPE 1 LOW PRESSURES	TYPE 1 HIGH PRESSURES	TYPE 2 1 STAGE	TYPE 2 COLUMN	TYPE 3 STEAM HEATER	TYPE 1 BB / BW
Min temperature (°C)	-100	-100	-100	-100	-100	-100
Max temperature (°C)	450	450	450	450	450	150
Max pressure (Bar)	25	80	25	25	25	8
Max area (m²)	700	700	700	3000	700	100

MATERIALS AVAILABLE

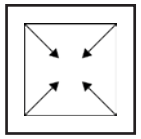
Stainless steel	Stainless steel / Nickel based alloys	Titanium	Carbon steel
304L	254 SMO	Titanium Gr1	SA516 Gr60
316L	C276	Titanium Gr2	SA516 Gr70
Duplex	904L		
Superduplex	Alloy 59		

Others materials are available upon request.



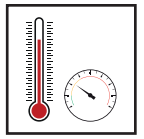
WELDED PLATE HEAT EXCHANGERS

ROBUSTNESS



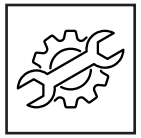
COMPACITY

HIGH TURBULENT FLOW INDUCED BY OUR PLATES

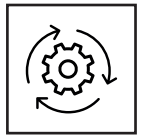


HIGH PRESSURES & TEMPERATURES

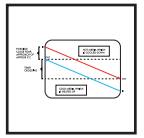
HANDLE CORROSIVE/ EROSIVE FOULING MEDIAS



LOW MAINTENANCE COSTS

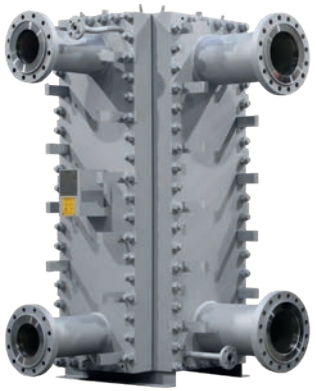


LOW OPERATING COSTS



CLOSE TEMPERATURE APPROACH

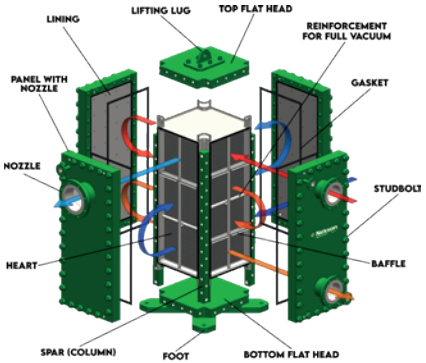
GreenBox™ Type S
Removable side panels



Nexson GreenBox™ S is a compact welded plate heat exchanger, made of square plates welded together, forming the heart of the heat exchanger. The heart is enclosed into a bolted frame, both hot & cold side channels are easy to access for inspection and cleaning.

There are no gaskets between the plates, instead a strong weld makes it leak proof. Only the removable side panels require gaskets for external sealing.

Nexson patented soft corners design makes the GreenBox™ S the most robust of its category. The mechanical reliability of the ingenious soft corner design is the ideal solution for operation in tough process duties with high pressures (**up to 50 barg**) and temperatures (**up to 400°C**) in liquid/liquid or biphasic applications.



	WX20	WX35	WX50	WX80
Max Plates	100	200	300	500
Max Area (m^2)	6,6	31,1	88,9	384
Max Unit Height (mm)	647	1475	1930	3750
Connection sizes	25-150 DN (1 - 6")	25-300 DN (1 - 12")	25-450 DN (1 - 18")	25-700 DN (1 - 28")

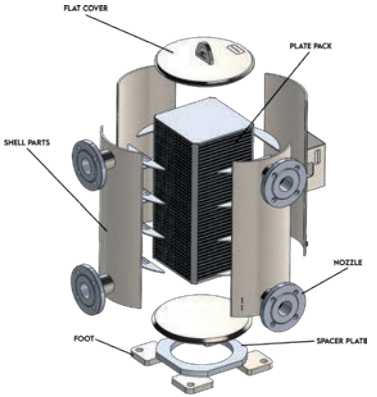
Welded plate heat exchangers - Liquid/Liquid | Biphasic

GreenBox™ Type W
Fully welded equipment

Nexson GreenBox™ W is a fully welded compact plate heat exchanger, made of square plates welded together, forming the heart of the heat exchanger, which is enclosed into a circular shell frame. Due to his fully welded design, the mechanical access is not possible.

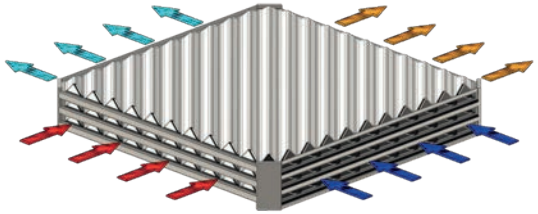
There are no gaskets between plates, instead a strong welds makes it leakproof, designed for high pressures applications (**up to 130 barg**), mainly clean applications.

It provides a concentration of thermal efficiency and compactness, making it very versatile and robust, offering in our fit for purposed approach to serve our customers.



	WX20	WX35	WX50	WX80
Max Plates	100	200	300	500
Max Area (m^2)	6,6	31,1	88,9	384
Max Unit Height (mm)	647	1475	1930	3750
Connection sizes	25-150 DN (1 - 6")	25-300 DN (1 - 12")	25-450 DN (1 - 18")	25-700 DN (1 - 28")

Corrugated plates
Adapted to clean/semi-fouling medias



Operating conditions	Avantages
· Temperature : -100°C to 400°C	· Robust design (strong welds and patented soft corner design)
· Max Temperature differences (HSI-CSI) : 200°C	· High turbulent flow, High K values
· Pressure : from Vacuum up to 55 Barg at full differential conditions (except for soft material*)	· No retention area on the back side of the weld
· Max differential pressure on soft material : 18 barg	· No minimum differential pressure needed in operation

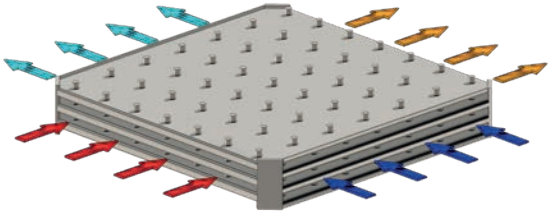
Materials

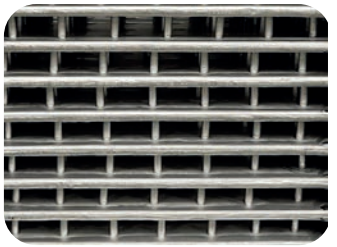
Stainless steel	Stainless steel / Nickel based alloys	Titanium
304L 316L 316Ti	254 SMO C276 904L* Alloy 59 Nickel 200/201	Titanium Gr1* Titanium Gr11*

Others materials are available upon request.

Welded plate heat exchangers - Plates options

Studded plates
Adapted to fouling medias



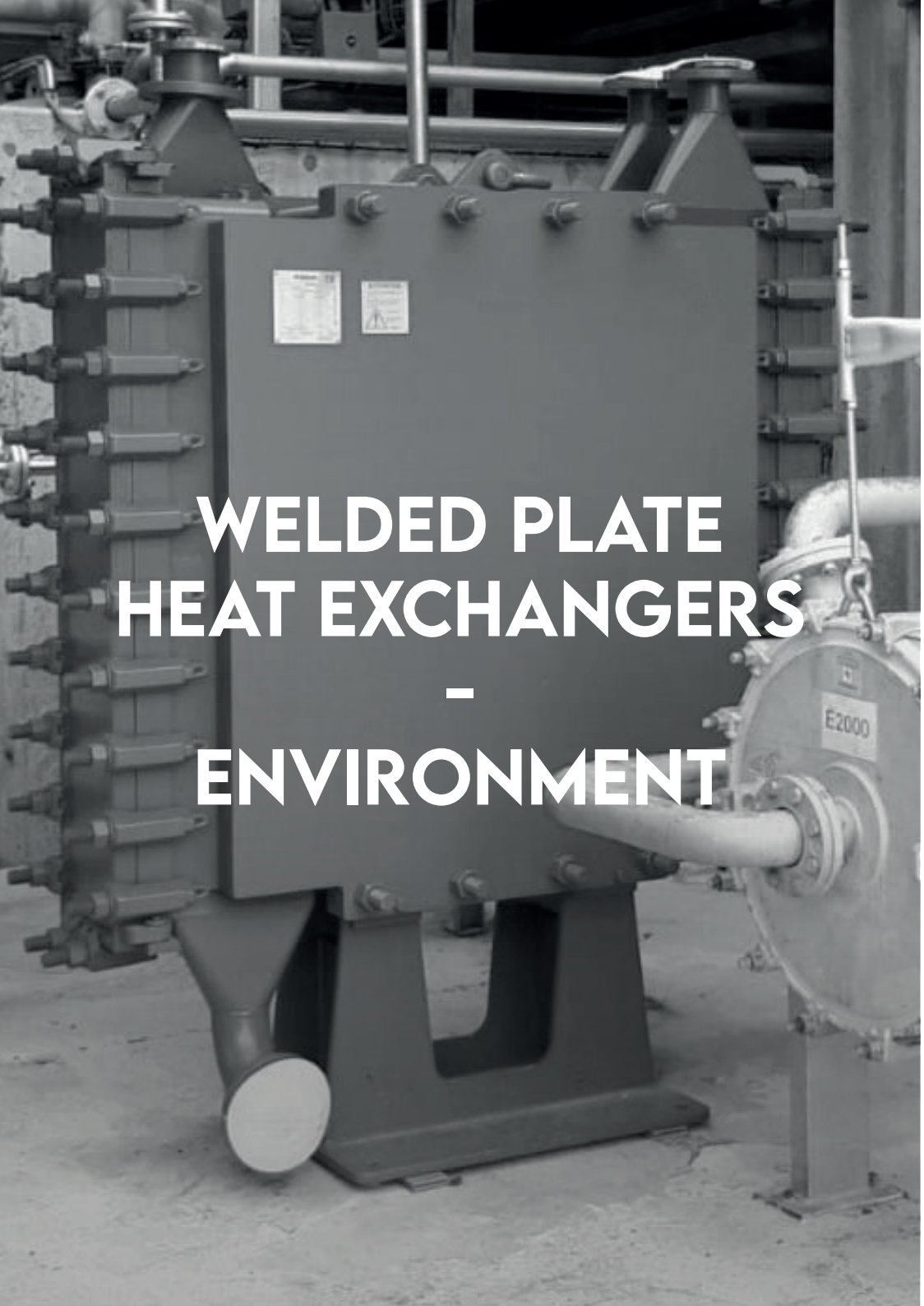


Operating conditions	Avantages
· Temperature : -100°C to 400°C	· Robust construction (strong welds and patented soft corner design)
· Max Temperature differences (HSI-CSI) : 250°C	· Easy for inspection and cleaning
· Pressure : from Vacuum up to 40 Barg at full differential conditions (except for soft material)	· Can handle big particules (plate gap up to 30mm)
· Max differential pressure on soft material* : 15 barg	· Can handle long fibers (stud free configuration)

Materials

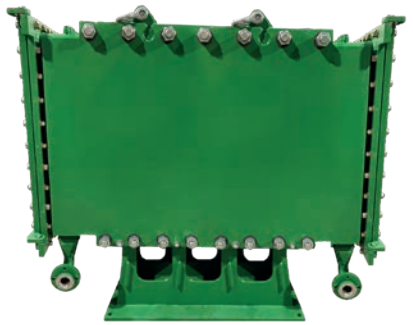
Stainless steel	Stainless steel / Nickel based alloys	Titanium	Carbon steel
304L 316L Duplex Superduplex	254 SMO C276 904L* Alloy 59 Nickel 200/201	Titanium Gr2* Titanium Gr7*	SA516 Gr70N

Others materials are available upon request.



WELDED PLATE HEAT EXCHANGERS - ENVIRONMENT

GreenBox™ Type R
Modular heat exchanger



GreenBox™ R is a compact,modular, fully welded Heat Exchanger designed primarily for sludge and biosolids treatment. The GreenBox™ range provides a concentration of thermal efficiency and compactness, it is the most versatile of its category.

GreenBox™ R are suitable for a wide variety of applications and are used for :

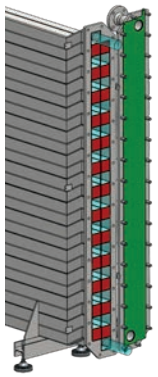
- Media with suspended matter such as fibers and sludge
- High viscosity fluids
- Dirty effluent
- ...

OPENABLE

- Fully openable version for fluids suspected of clogging or coagulation
- Hinges make it easy to open the channel without the need for handling equipment
- No loss of capacity over the years

FULLY WELDED EQUIPMENT

- Simple, robust and uncluttered design
- Optimized turn-around area thanks to rounded shape to reduce load losses and deposits
- No risk of leakage or alteration over time



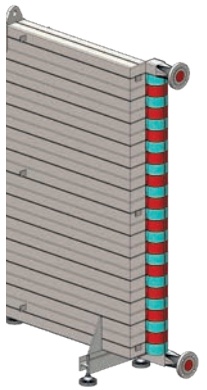
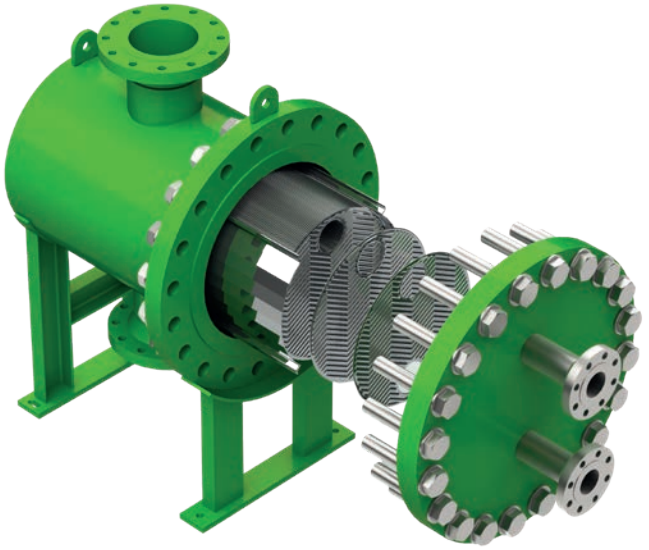


PLATE AND SHELL HEAT EXCHANGERS - ALL INDUSTRIES



ROBUSTNESS

COMPACITY

HIGH TURBULENT FLOW INDUCED BY OUR CORRUGATED PLATES

HIGH PRESSURES & TEMPERATURES

HANDLE CORROSIVE/ EROSIVE FOULING MEDIAS

LOW MAINTENANCE COSTS

LOW OPERATING COSTS

CLOSE TEMPERATURE APPROACH

GreenP&S Type W
Plate & Shell fully welded

Plate and shell fully welded heat exchangers are suitable for various industrial fields, with advantages such as efficiency, safety, and compactness. They can be customized according to customer specific process conditions, and are resistant to high temperature, high pressure, and corrosion.

The core component of Nexson GreenP&S Type W is a set of circular corrugated plates welded together, which achieve sealing between channels through alternating welding.

The welded plate core is filled and fixed in the circular shell, and there are no sealing gaskets between the plates. It can be applied in corrosive, high-temperature, and high-pressure environments.

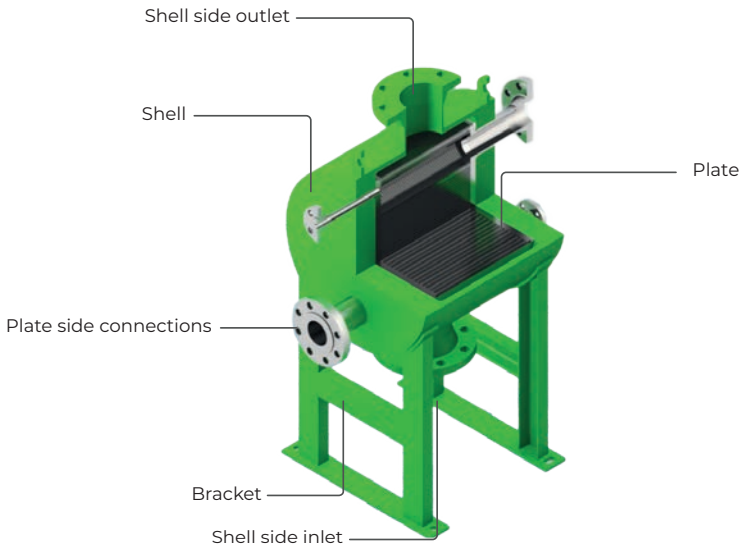


Plate and Shell heat exchangers - Liquid/Liquid | Biphasic

GreenP&S TYPE O
Plate & Shell openable

Plate and shell openable heat exchangers are suitable for various industrial fields, with advantages such as efficiency, safety, and compactness. They can be customized according to customer specific process conditions, and are resistant to high temperature, high pressure, and corrosion.

The core component of Nexson GreenP&S Type O is a set of circular corrugated plates welded together, which achieve sealing between channels through alternating welding.

The welded plate core is filled and fixed in the circular shell, and there are no sealing gaskets between the plates. It can be applied in corrosive, high-temperature, and high-pressure environments. The panel is removable, allowing easy access to the core for inspection and/or mechanical cleaning.

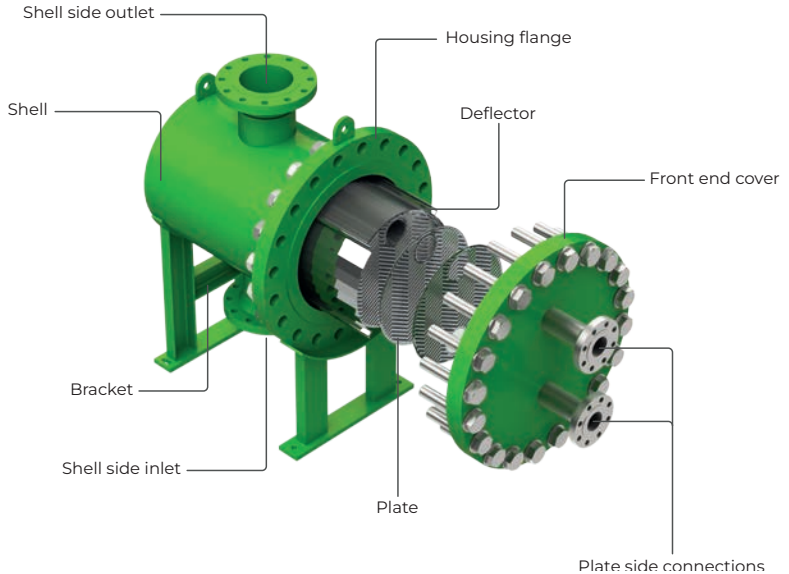


Plate and Shell heat exchangers - Liquid/Liquid | Biphasic

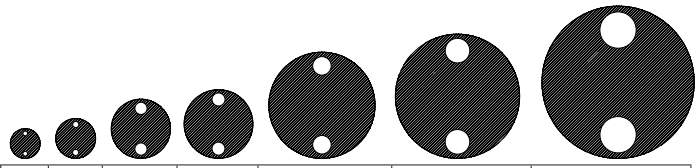
GreenP&S Type K
Kettle Reboiler

GreenP&S type K, Kettle Reboiler is suitable for various industrial fields, with advantages such as efficiency, safety, and compactness. They can be customized according to customer specific process conditions, and are resistant to high temperature, high pressure, and corrosion.

GreenP&S Type K is known as a flooded evaporator. It operates by maintaining a liquid refrigerant level inside the evaporator, ensuring that the heat transfer surfaces are continuously submerged in liquid refrigerant.

It is use to evaporate media (like ammonia) with a hot stream. This solution is widely used in refrigeration, heat pump and ORC cycles. The flow of heat (in the plates) boils the cold bath (in the shell) in counter-current. The manifold ensures good gravitational phase separation. The manifold design limits the size of the shell and therefore the thickness of the shell, as well as the amount of fluid to be evaporate (savings on operating costs).

GreenP&S · Plates range
Plate & Shell heat exchanger



Type	WR20	WR35	WR40	WR50	WR85	WR100	WR120
Port diameter (DN)	DN40	DN50	DN100	DN100	DN150	DN200	DN300
Plate diameter (mm)	242	323	480	556	862	1008	1236
Center distance (mm)	164	227	330	400	640	740	850

APPLICATIONS

	GreenBox			GreenP&S		
	TYPE S	TYPE W	TYPE R	TYPE W	TYPE O	TYPE K
OIL & GAS | REFINERY	●			●	●	
PETROCHEMICAL	●	●		●	●	
MINING & STEEL	●			●	●	
PULP & PAPER	●			●	●	
POWER	●	●		●	●	
AGRO INDUSTRY	●	●	●	●	●	
PHARMACEUTICAL	●			●	●	
SEWAGE			●			
REFRIGERATION		●		●	●	●
HVAC		●		●	●	
HYDROGEN	●	●		●	●	
CARBON CAPTURE	●	●		●	●	
MARINE		●		●	●	

TECHNICAL DATA

	TYPE S	TYPE W	TYPE R	TYPE W	TYPE O	TYPE K
Min temperature (°C)	-100	-200	0	-196	-196	-196
Max temperature (°C)	400	400	150	500	500	500
Max pressure (Bar)	50	130	8	150	120	120

MATERIALS AVAILABLE

Stainless steel	Stainless steel / Nickel based alloys	Titanium	Carbon steel
304/304L	254 SMO	Titanium Gr1	SA516 Gr70N
316/316L	C276	Titanium Gr2*	
316 Ti	904L	Titanium Gr11	
Duplex*	Alloy 59	Titanium Gr7*	
Superduplex*	Alloy 201		

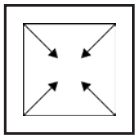
Others materials are available upon request.

* studded plates

Printed Circuit Heat Exchanger - PCHE
Ultra-compact & high performance

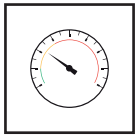
Printed Circuit Heat Exchangers (PCHEs) are a class of compact, high-performance heat exchangers fabricated using photochemical etching and diffusion bonding techniques. Flow channels, typically 0.1–2 mm in diameter, are chemically etched onto metal plates in a parallel or zigzag arrangement, enabling high heat transfer surface area per unit volume. These plates are then stacked and diffusion bonded under high temperature and pressure to form a monolithic core without welding, resulting in superior mechanical integrity.

PCHEs are capable of operating at pressures exceeding 1000 bar and temperatures over 1000°C, with heat transfer coefficients significantly higher than conventional shell-and-tube exchangers. Their high surface area density (up to 6000 m^2/m^3) and counterflow design enable exceptional thermal efficiency in a compact footprint. They are particularly suited for applications involving supercritical fluids, high-pressure gas processing, and advanced nuclear and hydrogen energy systems.



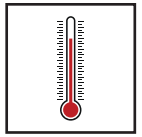
HIGH COMPACTNESS

Small size light weight 6000m2/m3, channel size 0.1~2mm



HIGH PRESSURES

The design pressure can reach up to 100MPa, and the welding strength is equal to the strength of the base material



HIGH TEMPERATURES

The design temperature allows -253°C to about 1000°C

MATERIALS

Titanium alloy, stainless steel, duplex steel, high temperature alloy ...

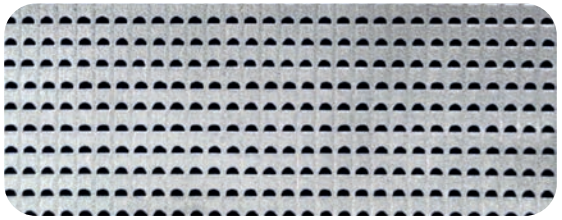
HIGH EFFICIENCY

Very high heat transfer coefficient

WIDE RANGE OF MEDIA

Natural gas, sea water, hydrogen, antifreeze, etc.

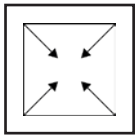
Max unit size : 3000x600x600mm



GreenTube™ - CWHE
Coil wound heat exchanger

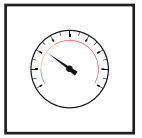
Coil wound heat exchangers are one of the most advanced, efficient and energy-saving heat exchange equipment in the world for such size of heat exchanger. The coil wound heat exchanger is made of one or more groups of spirally wound tubes placed in a shell. The heat exchange tubes has enhanced heat transfer elements such as smooth tubes, corrugated tubes and internal thread external bellows, which are arranged in the shell at different spiral angles.

Due to the spiral design of the tubes, the fluid has to change direction continuously, thus facilitating turbulent flow. This increases heat transfer efficiency and reduces the heat exchange surface area. Compared with ordinary shell and tube heat exchangers, its heat transfer coefficient can be increased by 6 times.



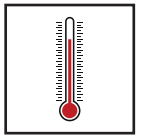
COMPACTNESS

Compact & Smaller than Shell & Tubes



HIGH PRESSURES

Up to 300 barg (shell side)
Up to 1400 barg (tube side)



HIGH TEMPERATURES

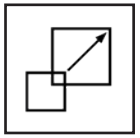
-250°C to 650°C

HIGH EFFICIENCY

Very high heat transfer coefficient

MATERIALS

Stainless steel, Special steel alloys, carbon steel, aluminium, copper ...

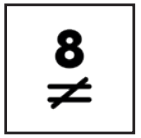


EASY TO ACHIEVE LARGE SCALE

Up to 25 000 m^2

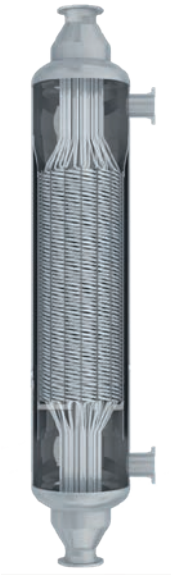
CONDENSATION

The tube side medium stays in the heat exchange tube bundle for a longer time, and the condensation is more complete



IMPLEMENT VARIETY OF MEDIAS

Up to 8 different medias simultaneously



thermowave

Brand of Nexson Group

thermowave GmbH is a leading manufacturer of plate heat exchangers configured according to customer specifications in a wide range of materials, frame designs and sizes. Its head office is in Berga halfway between Göttingen and Leipzig.

The product portfolio covers everything from standard heat exchangers for HVAC applications to highly specialised apparatuses for industrial refrigeration, the food and beverages industry, the chemical and process industry, and the energy sector.

10 000 sqm
Production area

3000
Units per years

30+ years A quarter-century quality and experience

Rapid expansion of product portfolio and equipment

The product portfolio was already undergoing expansion as a laser-welding machine now complemented the machine park, making it possible to also offer welded modules.

The product range as well as the technical equipment of the production facilities also continued to grow continuously in the subsequent period. Three product lines leading to the company's decision to build a second production hall for even more sophisticated plate heat exchangers.

Quality experience

Qualified and motivated staff ensure a consistently high level of quality across all products to the benefit of their customers. thermowave's experience in the industrial transfer of heat allow them to develop new innovative products to launch onto the market.

PLATE HEAT EXCHANGERS RANGE

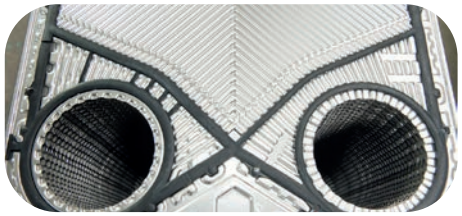
Plates type

Gasketed

Semi-welded

Double wall

Gasket connections - Clip in

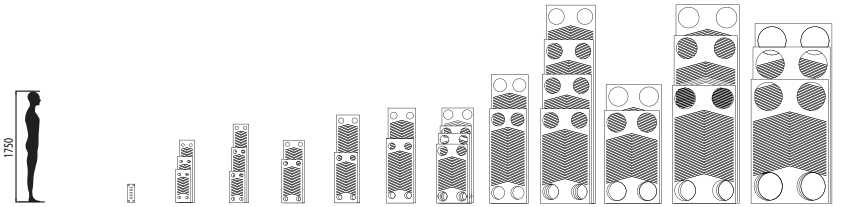


Materials

Plates			Gaskets
Stainless steel	**Stainless steel / Nickel based alloys**	**Titanium**	
		Titanium Gr1	NBR
304L	254 SMO	Titanium Gr11	EPDM
316L	C276		EPDM HT
	904L		HNBR
	Alloy 59		VITON A
	Nickel 200/201		VITON G

Others materials are available upon request.

Plates range



Port diameter (DN)	25	40	50	65	80	100	150	200	250	300	350	450
Length max. (mm)	287	981	1236	986	1383	1495	1498	2034	3122	1872	3126	2831
Width max. (mm)	116	244	246	329	369	437	496	586	774	868	995	1215
Length / Width	2.47	4.02	5.02	2.99	3.74	3.42	3.02	3.47	4.03	2.15	3.14	2.33

Makes life fresh

Expert of Plate Heat Exchangers

thermolineECO™

Gasketed & Double wall

thermolineVARIO™

Gasketed, Semi-welded
& Double wall

thermolinePLUS™

Gasketed, Semi-welded
& Double wall

thermolinePURE™

Gasketed, Semi-welded
& Double wall

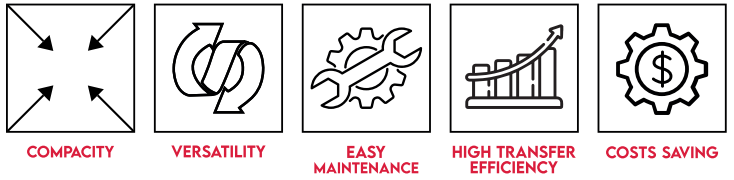
Gasketed Plate Heat Exchangers

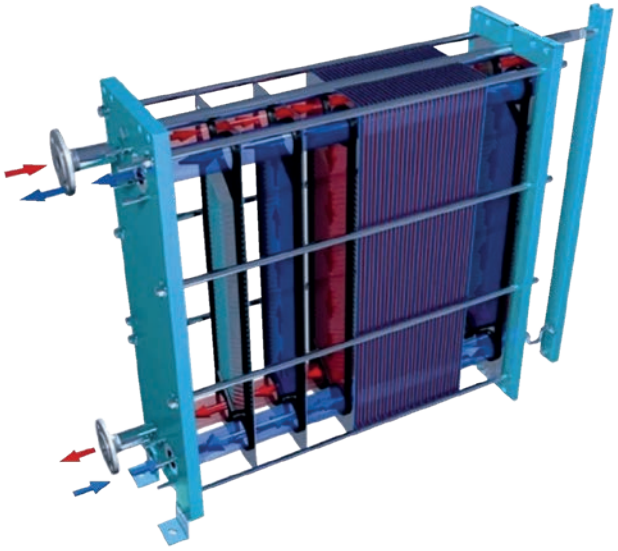
thermolineECO, VARIO, PLUS & PURE
Flexible and high efficient solution

thermowave products versatile are designed to optimize heat exchange between fluids, offering unmatched performance and reliability.

The gasketed plate heat exchangers are engineered with precision, featuring individually stamped heat transfer plates with gaskets around each plate. This innovative design ensures a tight seal, preventing leaks and maximizing heat transfer efficiency.

Investing in gasketed plate heat exchangers can lead to significant cost savings over time.



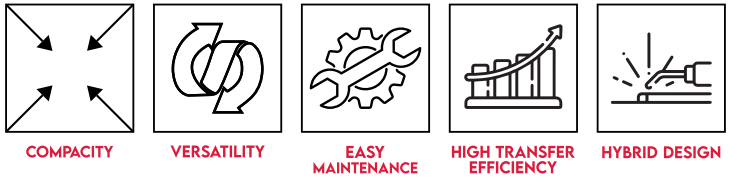


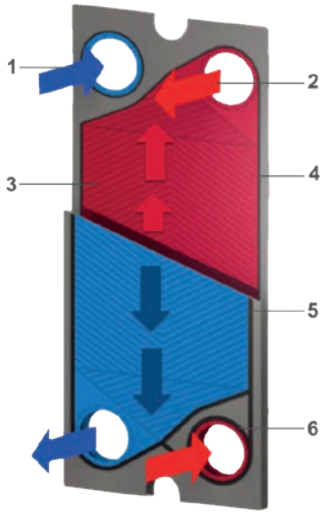
Semi-welded Plate Heat Exchangers

thermolineVARIO, PLUS & PURE
Hybrid design

thermowave products semi-welded plate heat exchangers combine the reliability of welded construction with the versatility of gasketed plates, offering unparalleled performance in a variety of applications.

Semi-welded plate heat exchangers feature a unique design that incorporates both welded and gasketed plates. This hybrid construction provides a secure seal for one fluid stream while allowing for easy disassembly and maintenance of the other. The result is a durable and efficient heat exchanger that can withstand demanding operating conditions.





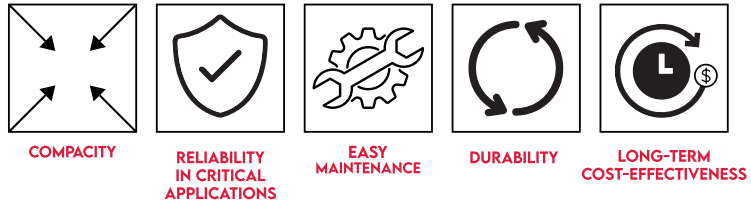
1. Uncritical Medium
2. Critical Medium
3. Laser welded plate gap
4. Laser weld
5. Gasket (Field)
6. Gasket (Ring)

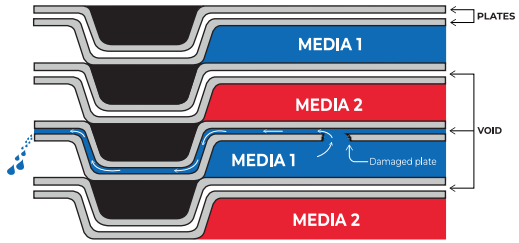
Double Wall Plate Heat Exchangers

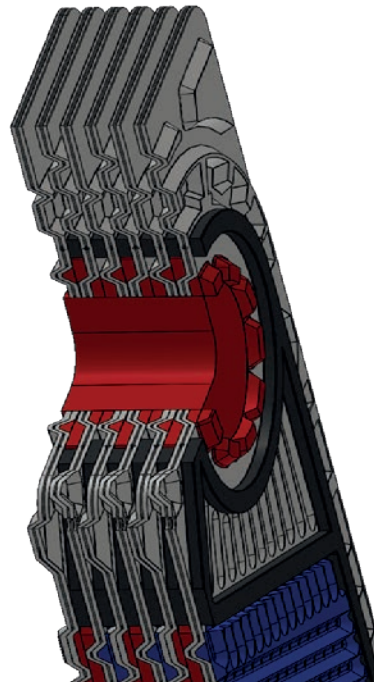
thermolineECO, VARIO, PLUS & PURE
Ultimate solution for fluid safety

thermowave products double wall plate heat exchangers are a vital innovation for industries that demand flawless fluid separation and efficient heat transfer. Whether used in food and beverage production, pharmaceutical manufacturing, or chemical processing, our exchangers ensure superior safety and unmatched reliability.

Our double wall plate heat exchangers feature two layers of plates between the hot and cold fluids, creating an extra barrier that prevents cross-contamination. This design allows for visible leak detection if one layer is compromised, ensuring safety. The unique construction guarantees optimal performance while prioritizing the integrity of the fluids.







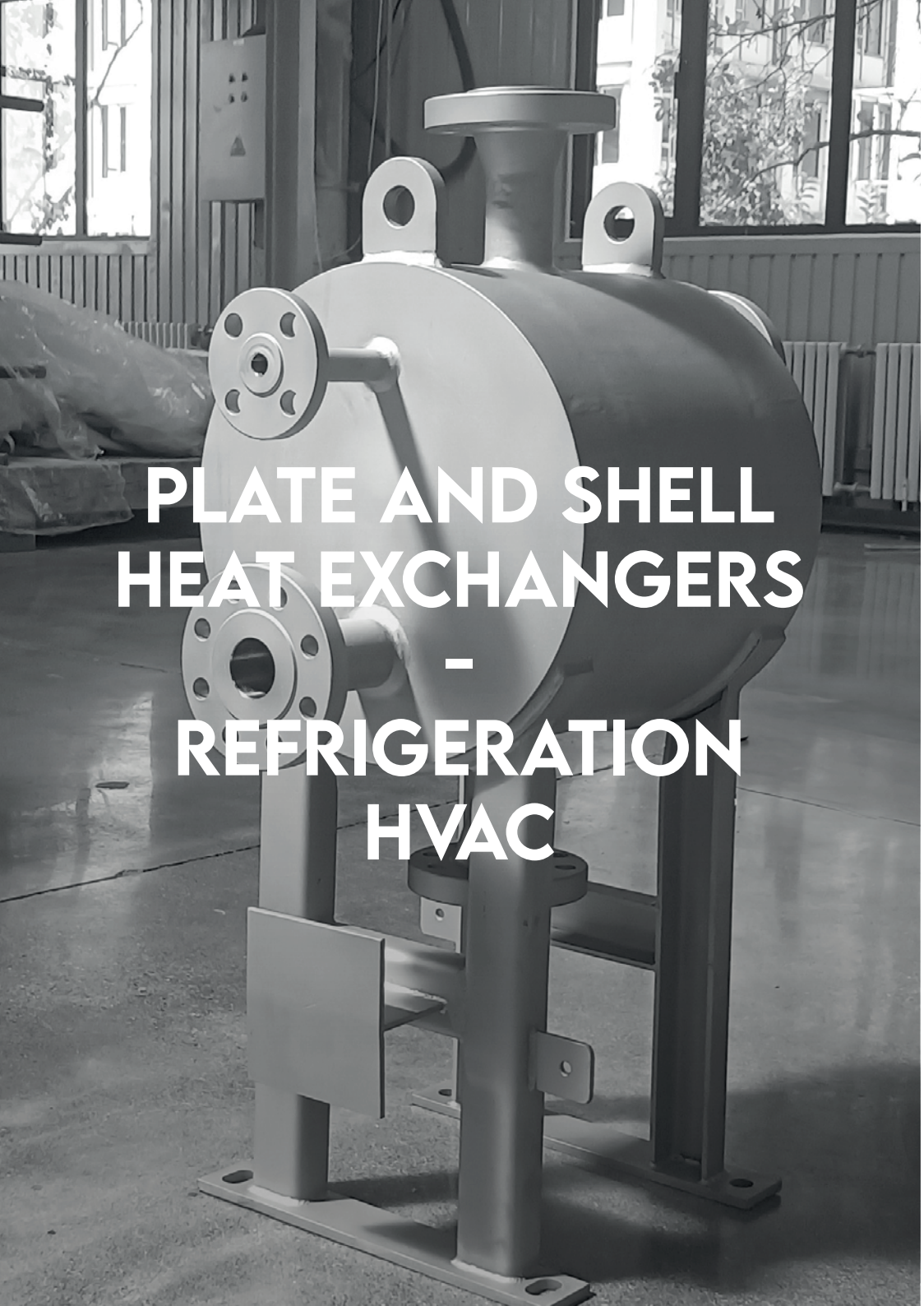
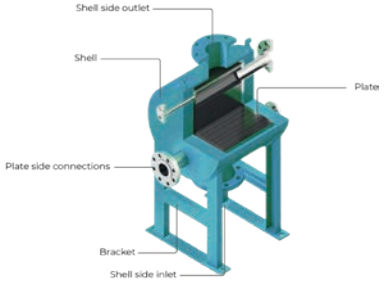


PLATE AND SHELL HEAT EXCHANGERS - REFRIGERATION HVAC

Plate and Shell heat exchangers - Liquid/Liquid | Biphasic

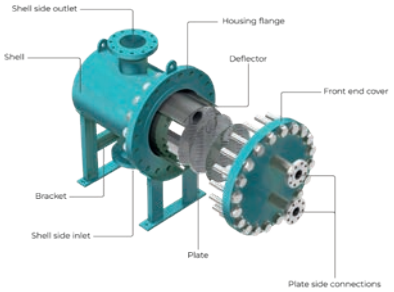
GreenP&S Type W
Plate & Shell fully welded



The core component of GreenP&S Type W is a set of circular corrugated plates welded together, which achieve sealing between channels through alternating welding.

The welded plate core is filled and fixed in the circular shell, and there are no sealing gaskets between the plates. It can be applied in corrosive, high-temperature, and high-pressure environments.

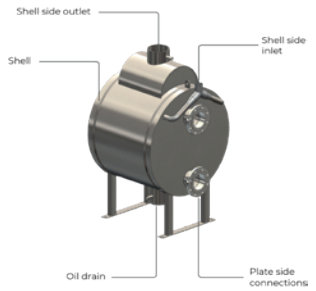
GreenP&S Type O
Plate & Shell Openable



GreenP&S Type O is a set of circular corrugated plates welded together, which achieve sealing between channels through alternating welding.

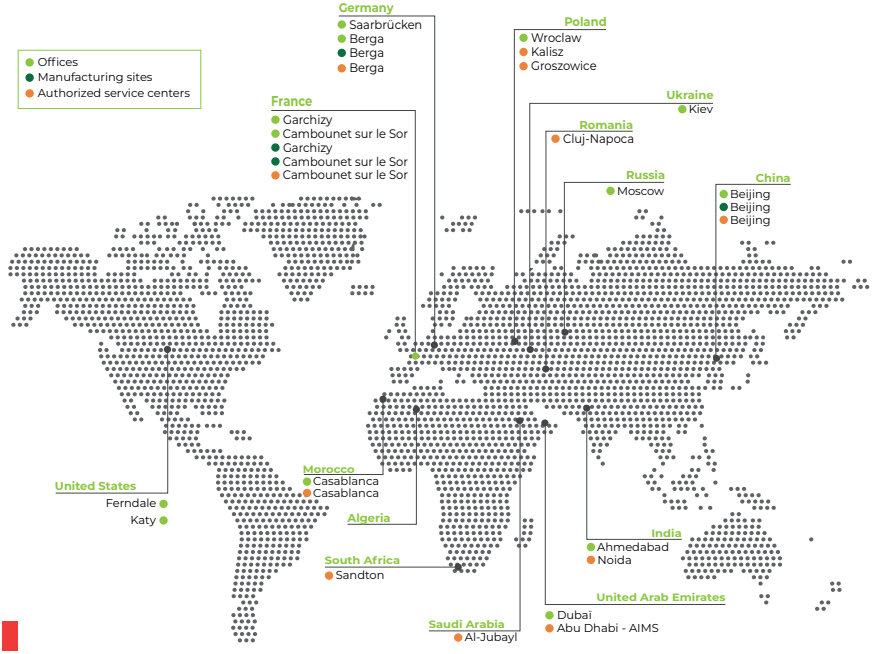
The welded plate core is filled and fixed in the circular shell, and there are no sealing gaskets between the plates. It can be applied in corrosive, high-temperature, and high-pressure environments. The panel is removable, allowing easy access to the core for inspection and/or mechanical cleaning.

GreenP&S Type K
Kettle Reboiler



GreenP&S Type K is use to evaporate media (like ammonia) with a hot stream. This solution is widely used in refrigeration, heat pump and ORC cycles. T

The flow of heat (in the plates) boils the cold bath (in the shell) in counter-current. The manifold ensures good gravitational phase separation. The manifold design limits the size of the shell and therefore the thickness of the shell, as well as the amount of fluid to be evaporate (savings on operating costs).



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