Product Literature
WELDED

EXTREME PERFORMANCE FOR EXTREME CONDITIONS

SUPERMAX®
SHELL & PLATE HE

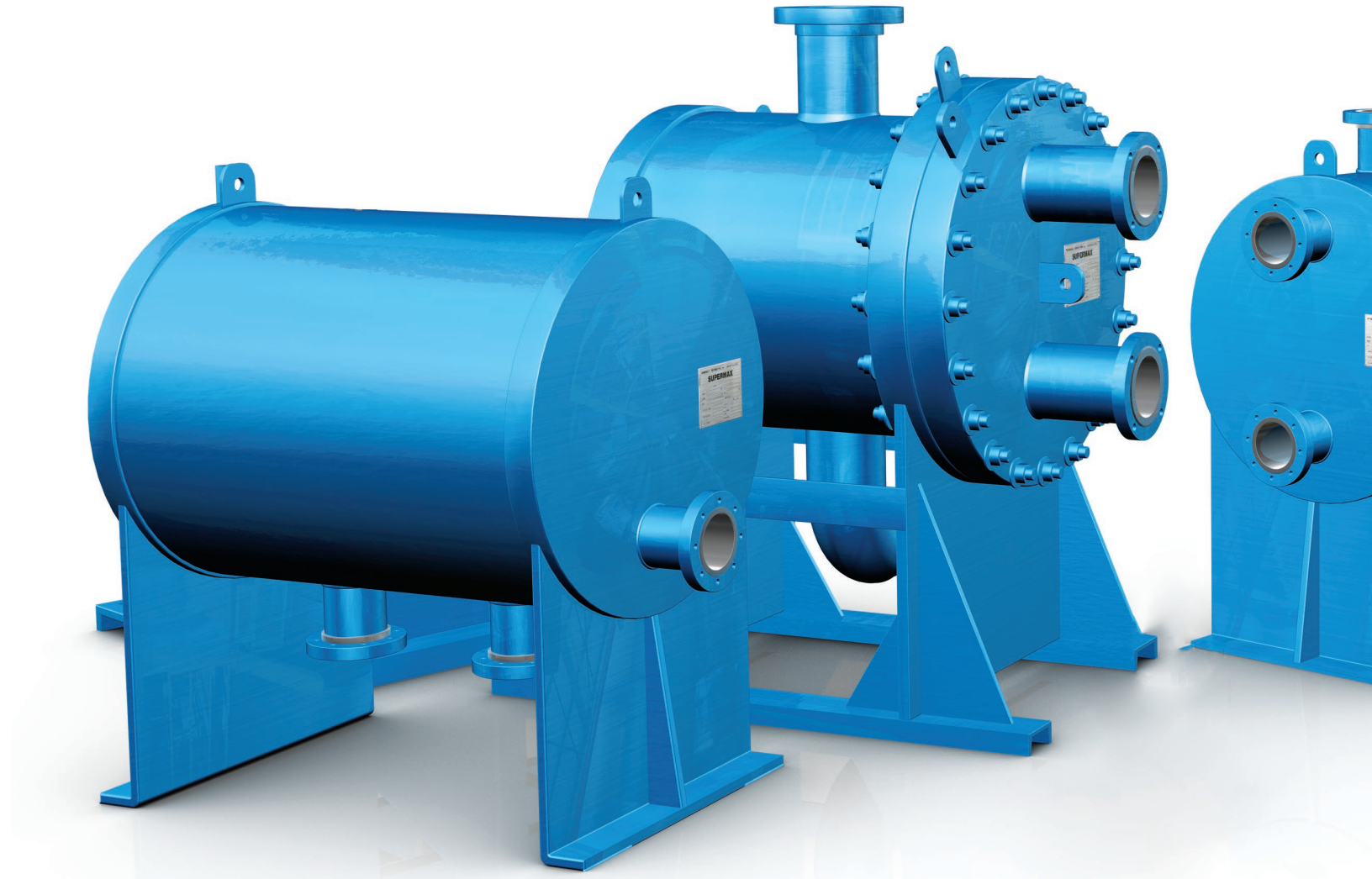
NOVUSBLOC®
WELDED PLATE HE

TRANTER®
The heat transfer people

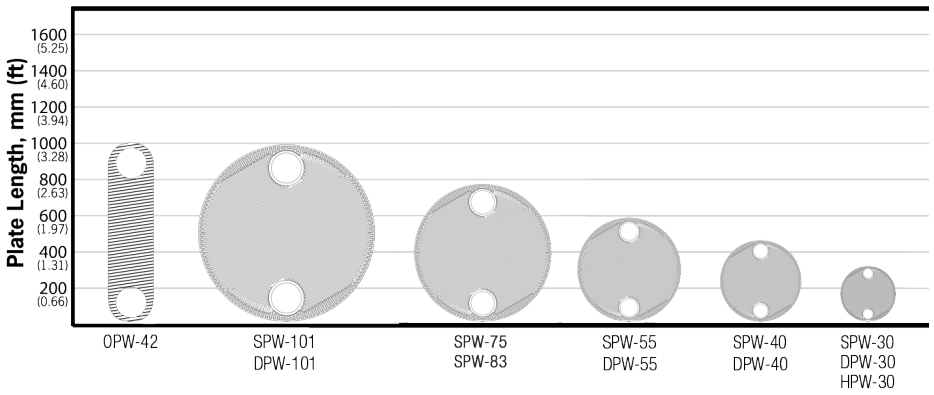
When Conditions Are Tough... Think Plates Instead Of Tubes

Now you can obtain the thermal efficiency and compactness of gasketed heat exchangers in elevated pressure/high- and low-temperature applications—with Tranter welded plate heat exchangers (PHEs). Until recently, heat exchangers in elevated pressure/temperature or corrosive media applications were often shell & tube (S&T) units. This meant constant tradeoffs in thermal efficiency, material mass and excessive physical footprint...until recently.

Tranter welded PHEs allow you to attain high heat transfer rates under elevated process conditions, in less space and at lower cost than S&T exchangers.



SUPERMAX® SPW, DPW and OPW Plate Range



PHE Comparative Footprint

Model	Required Surface Area, m^2 (ft^2)	Footprint Area, m^2 (ft^2)	Dry Weight, kg (lb)
TEMA Shell & Tube	203 (2,187)	9 (100)	6,350 (14,000)
SUPERMAX (SPW-55)	56 (600)[a]	0.7 (8)	726 (1,600)

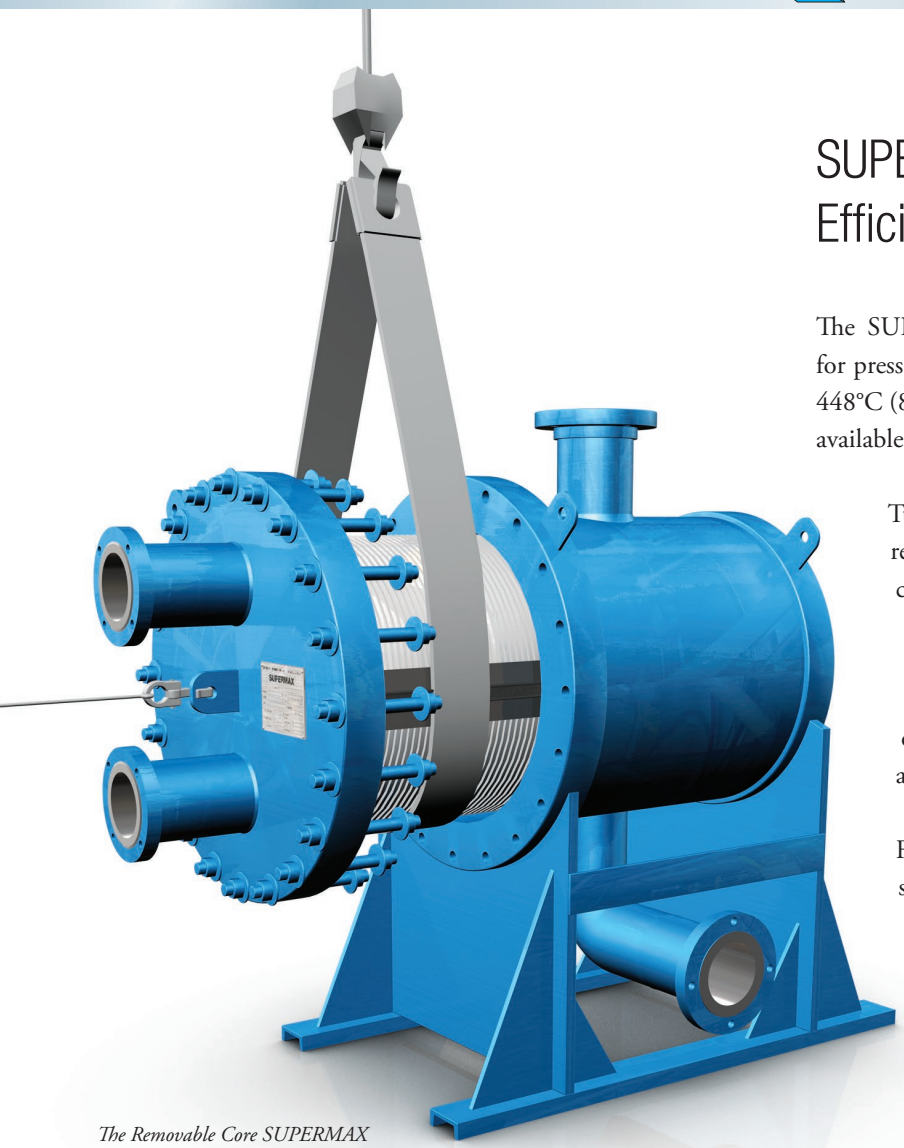
[a] Common HVAC water–water application—10°F approach.

From just a few plates come many duty configurations, represented by the blue SUPERMAX®. Back row, from left: Multi-Pass, Removable Core, Standard Single-Pass, Multi-Duty/Multi-Pass.

Plate Heat Exchanger Performance At Shell & Tube Pressures

Tranter's SUPERMAX® Welded Plate Heat Exchangers require only a fraction of the space of the equivalent shell & tube exchangers. Turbulent flow induced by the corrugated and dimpled plate patterns produces high heat transfer rates. This high efficiency allows Tranter to design compact exchangers with a 1°C (2°F) temperature approach. Another benefit is the small hold-up volume which offers fast start-up times and close following of process changes.

The advantages of the SUPERMAX exchangers can be applied to challenging applications involving liquids, gases, steam and two-phase mixtures. This includes aggressive media, organic solvents, steam heaters and as interchangers which are beyond the capability of traditional gasketed plate & frame heat exchangers. In addition to efficiency, the units offer cost effectiveness and minimal maintenance.



The Removable Core SUPERMAX exchanger is fully accessible on shell side for inspection and/or mechanical cleaning by removing the cover plate assembly.

SUPERMAX®—For Amazing Efficiency In A Small Footprint

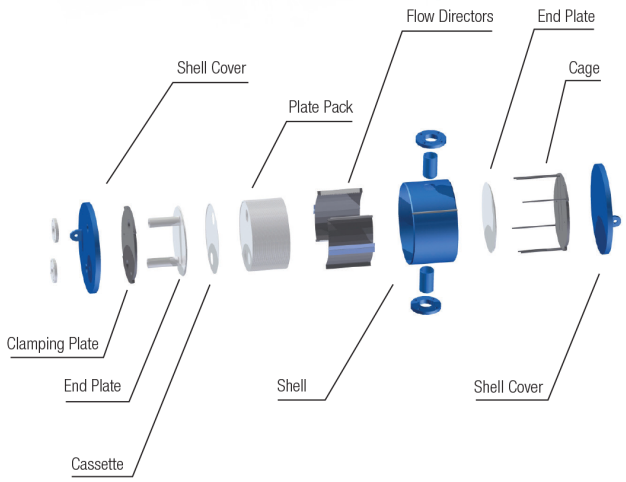
The SUPERMAX® Shell & Plate Heat Exchanger is designed for pressures to 103 barg (1,500 psig) and at temperatures up to 448°C (840°F) for standard range units. Extended range units are available for higher temperature and pressure applications.

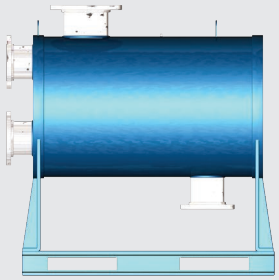
Turbulent flow, even at low velocities, enables stable capacity regulation and minimizes fouling. In refrigeration and cryogenic service, the exchangers require a low refrigerant charge. They are also resistant to freezing because of high fluid turbulence induced by the corrugated plate pattern. SUPERMAX wide temperature/pressure ratings offer good performance with natural refrigerants such as ammonia and carbon dioxide.

Fluids can undergo phase change on either the plate or shell side. The SUPERMAX is particularly suited to applications having a large flow imbalance, allowing higher flow rates on the shell side. The SUPERMAX can be installed horizontally or vertically; horizontal installation is recommended for condensing/evaporating/boiling applications.

Accordion-like core accommodates thermal expansion cycles

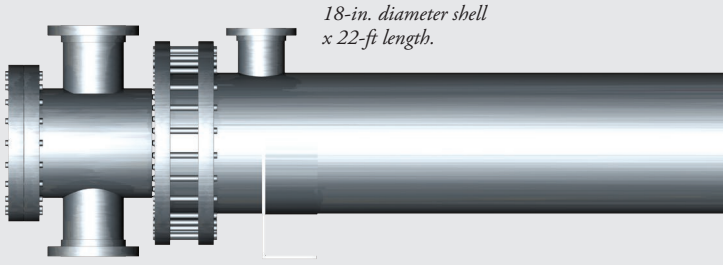
Pairs of chevron-type plates are placed back-to-back and fabricated into a cassette by full automatic perimeter welding of adjacent





SPW-55
24-in. diameter shell x 3-ft length, with a 300-plate plate pack.

Shell & Tube
18-in. diameter shell x 22-ft length.

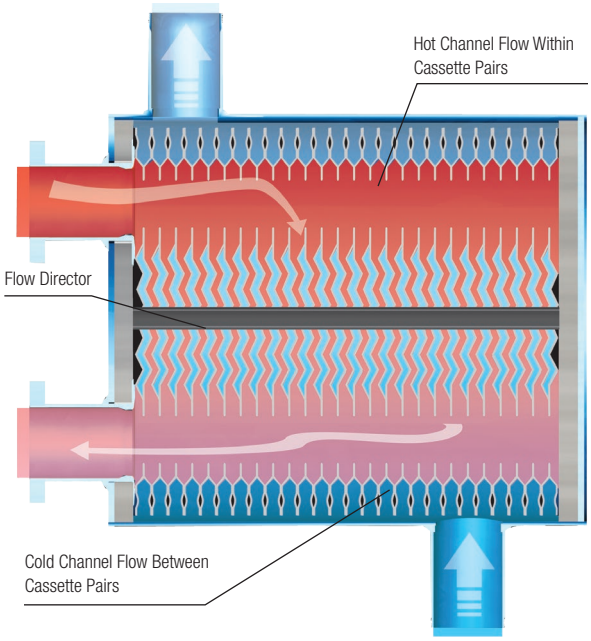


port holes. Cassettes are then placed together and perimeter welded to each other, producing an accordion-like core that is highly tolerant to thermal expansion.

The plate pack is then inserted in a cylindrical shell. Flow directors positioned between the shell and the plate pack ensure proper flow through the shell side channels. End plates, nozzles and top and bottom covers are welded to the shell to form a pressure vessel of high integrity. Extra-large nozzle sizes can be accommodated on the shell side of the exchanger. Plates can also be arranged to form multiple passes.

The right materials for the job

SUPERMAX plate materials may be type 316L stainless steel, Hastelloy C-276, AL6XN, SMO254 or other alloys; shells may be fabricated of carbon steel, Types 304, 316, 316L stainless steel or titanium. The unit can be fabricated from dissimilar metals when only one side will be exposed to corrosive conditions.



SUPERMAX countercurrent flow pattern can have hot channel on shell or plate side.

SUPERMAX Shell & Plate Round Exchanger Connections[1]

Plate Model	Plate-Side Connections, DN (ANSI in.)	Shell-Side Connections, DN (ANSI in.)
SPW-30	50 (2)	20–150 (0.75–6)
HPW-30	50 (2)	20–150 (0.75–6)
DPW-30[2]	50 (2)	20–150 (0.75–6)
SPW-40	80 (3)	25–250 (1–10)
DPW-40[2]	80 (3)	25–250 (1–10)
SPW-55	100 (4)	32–350 (1-1/4–14)
DPW-55[2]	100 (4)	32–350 (1-1/4–14)
SPW-75	150 (6)	50–500 (2–20)
SPW-83	150 (6)	50-500 (2-20)
SPW-101	200 (8)	100–700 (4–28)
DPW-101[2]	200 (8)	100–700 (4–28)

[1]Dual inlets on both plate and shell sides are available. [2]Deep draw depth plate.

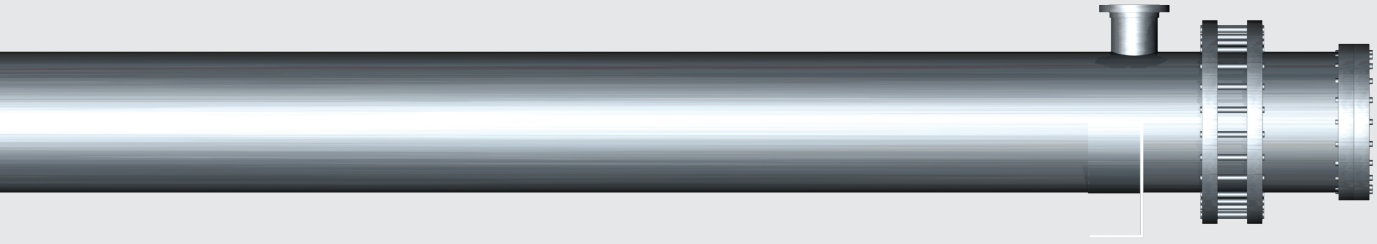
SUPERMAX Shell & Plate Oblong Exchanger Connections[1]

Plate Model	Plate-Side Connections, DN (ANSI in.)	Shell-Side Connections, DN (ANSI in.)
OPW-42	80 (3)	10–150 (0.5–6)

[1]Dual inlets on both plate and shell sides are available.

The Implications Of High Heat Transfer Rates

The illustration below depicts an actual SUPERMAX replacement for an S&T application. The significantly higher heat transfer rates of the SUPERMAX plates versus the tube bundle are responsible for the striking difference. The implications are clear: less cost for materials (stainless steel, titanium or other expensive higher alloys), simpler fabrication for shorter delivery lead times, easier installation, simpler support structures and vastly smaller footprints, especially considering dead space required to pull the S&T tube bundle for cleaning.



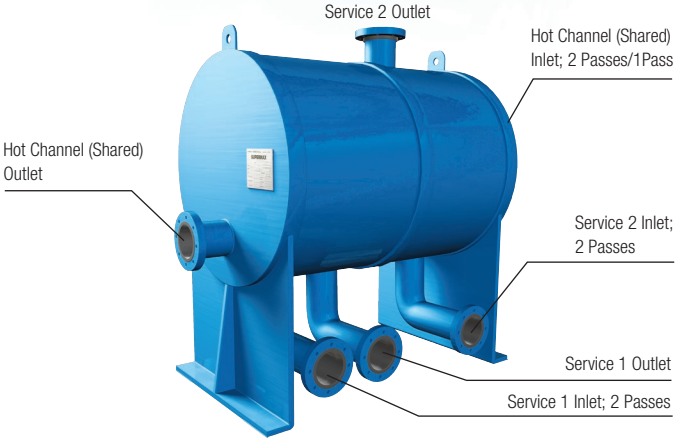
SUPERMAX Shell & Plate Exchanger can replace competitor's failing rectangular welded PHEs or gasketed PHEs with premature gasket failures.

Optional SUPERMAX Configurations Meet Special Needs

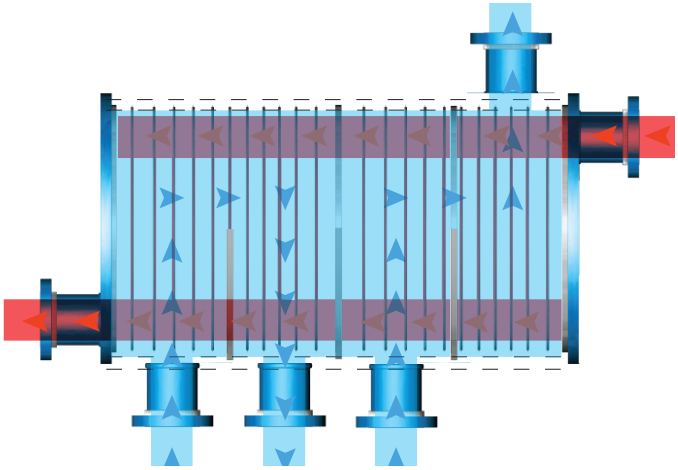
Various optional configurations of the SUPERMAX unit enable this versatile exchanger to meet wide-ranging application needs. The Removable Core SUPERMAX exchanger provides full accessibility to the plate pack for inspection and/or mechanical cleaning by removing the plate pack bundle.

The Multi-Duty SUPERMAX has two separate plate packs that share one shell. These cores can handle different or identical fluids. For flows that require a high flow rate, the two inlets and outlets can be piped together.

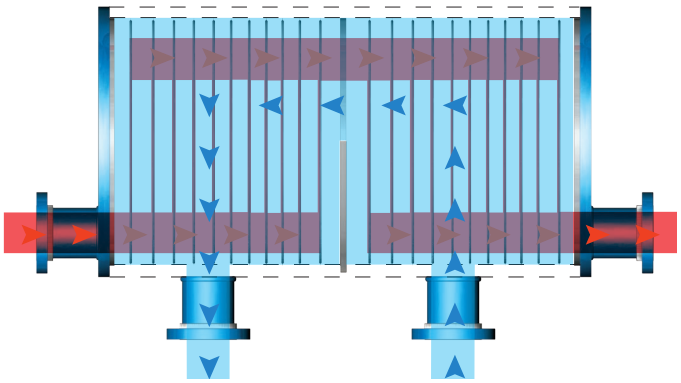
Units can be precisely configured for specific requirements, such as cooling without condensing, by employing the Multi-Pass SUPERMAX configuration and by grouping plates in pure co-current, counter-current or cross-flow duties.



Outstanding versatility (from left): a round-plate R404a- DX-cascade with CO_2 collector and a large-flow shell-side condenser .



The Multi-Duty SUPERMAX, which unites independent plate packs in a single shell, is common for glycol gas dehydration and for gas refrigeration applications at gas plants.



The Multi-Pass SUPERMAX has separate plate pack and shell zones with countercurrent (shown above) or co-current flow.

SUPERMAX Applications

Efficiency and ease of maintenance mark the versatility of Tranter plate heat exchangers in heating and cryogenic duties such as found in gas processing and refrigeration. Consider the benefits of thermal efficiency and compactness offered by plate heat exchangers in applications traditionally handled by S&T heat exchangers.

Ammonia evaporator.

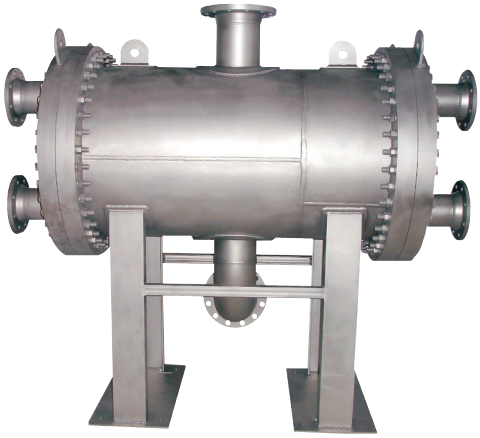
Reducing maintenance as a demethanizer low side heater replacing brazed units.

Oblong in tube as a compact evaporator and receiver system providing heat transfer and simultaneous vapor release and separation.

Compact, skid-mounted propane condenser.

Two evaporators in parallel with separator handling R507 refrigerant.

Multi-duty, multi-pass rich TEG heater for gas dehydration skid.



Two-Duty exchanger in one shell.

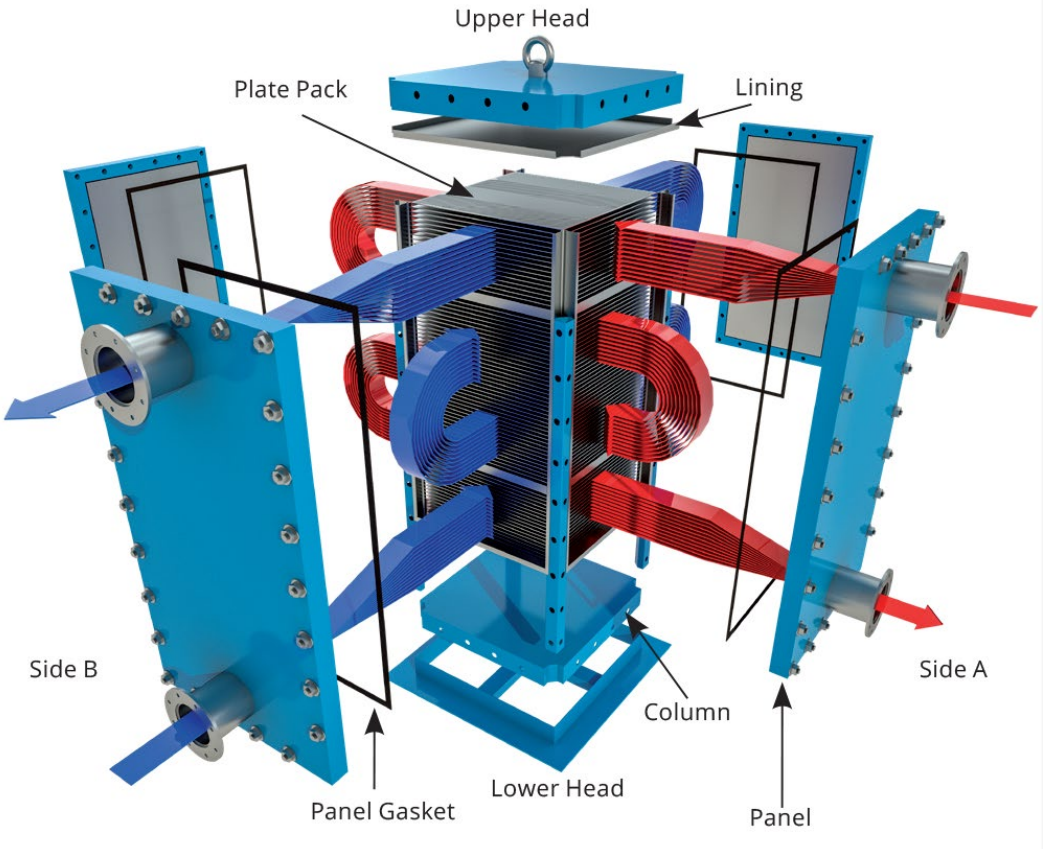
The NOVUSBLOC® comes in Four (4) Different Models

Available for global energy intensive markets the NovusBloc® welded plate heat exchanger encompasses a Tranter premium design concept offering a significant boost in heat exchange performance and durability for these processes.

As confirmed by extensive heat transfer, plus both pressure - and temperature fatigue qualification testing, the NovusBloc® offers outstanding potential for reduced unit size, weight and footprint with increased durability in a wide range of applications. The patented design offers unique features - and benefits, which makes it a truly innovative design adding value to our customers.

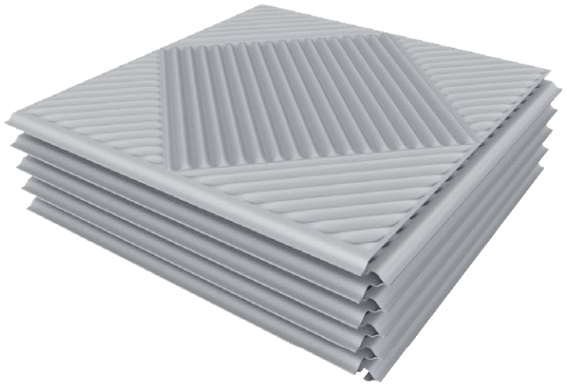
The NovusBloc® is fully accessible for mechanical cleaning and visual inspection making it our customers' first choice of heat exchanger for applications with high fouling tendency.

The NovusBloc® comes in four - different models, depending on the user's heat transfer duty requirements.



The NOVUSBLOC®
Plate Heat Exchanger

The NovusBloc® is able to withstand tough design conditions and the heat transfer plates can be pressed in many different materials. The product is available for the design specifications shown in the table:



	Minimum	Maximum
Area (m2/set)	6,6	865
Temperature (°C)	- 50	375
Pressure (bar)	Full Vacuum	42
Code / Directive	ASME, PED	
Plate Material	Stainless Steels : SS316L, 254SMO Nickel Alloys : C-276, 825 Titanium : Ti.Gr.1, Ti.Gr.11	
Plate Thickness	1.0 mm and 1.2 mm	

The NovusBloc® range incorporates unique premium design approaches in the following areas:

- Novel plate design which minimizes unnecessary additional pressure loss at the fluid inlet of each pass and enhances the weld quality of the plate welds.

- Highly innovative column lining design which enables the lining to move naturally when exposed to high temperatures thus minimizing failures due to thermal shocks by providing a uniform stress contour and reducing overall stress concentration in the lining.

In summary, the NovusBloc® is the premium product for your heat transfer needs!

NO.	Model	Heat Transfer Area	Plate Size		Max Connection Size	Max Unit Height (mm)
		sq m	L (mm)	W (mm)		
1	TB030	0,11	333	333	DN 150 / ANSI 6”	1400
2	TB050	0,27	496	496	DN 300 / ANSI 12”	2150
3	TB075	0,64	762	762	DN 500 / ANSI 20”	3475
4	TB120	1,72	1219	1219	DN 1000 / ANSI 40”	3570

PHE Performance In Many Forms

SUPERCHANGER® Plate & Frame Heat Exchangers

The SUPERCHANGER heat exchanger is designed to provide maximum efficiency in transferring heat from one liquid to another or from steam to liquid.

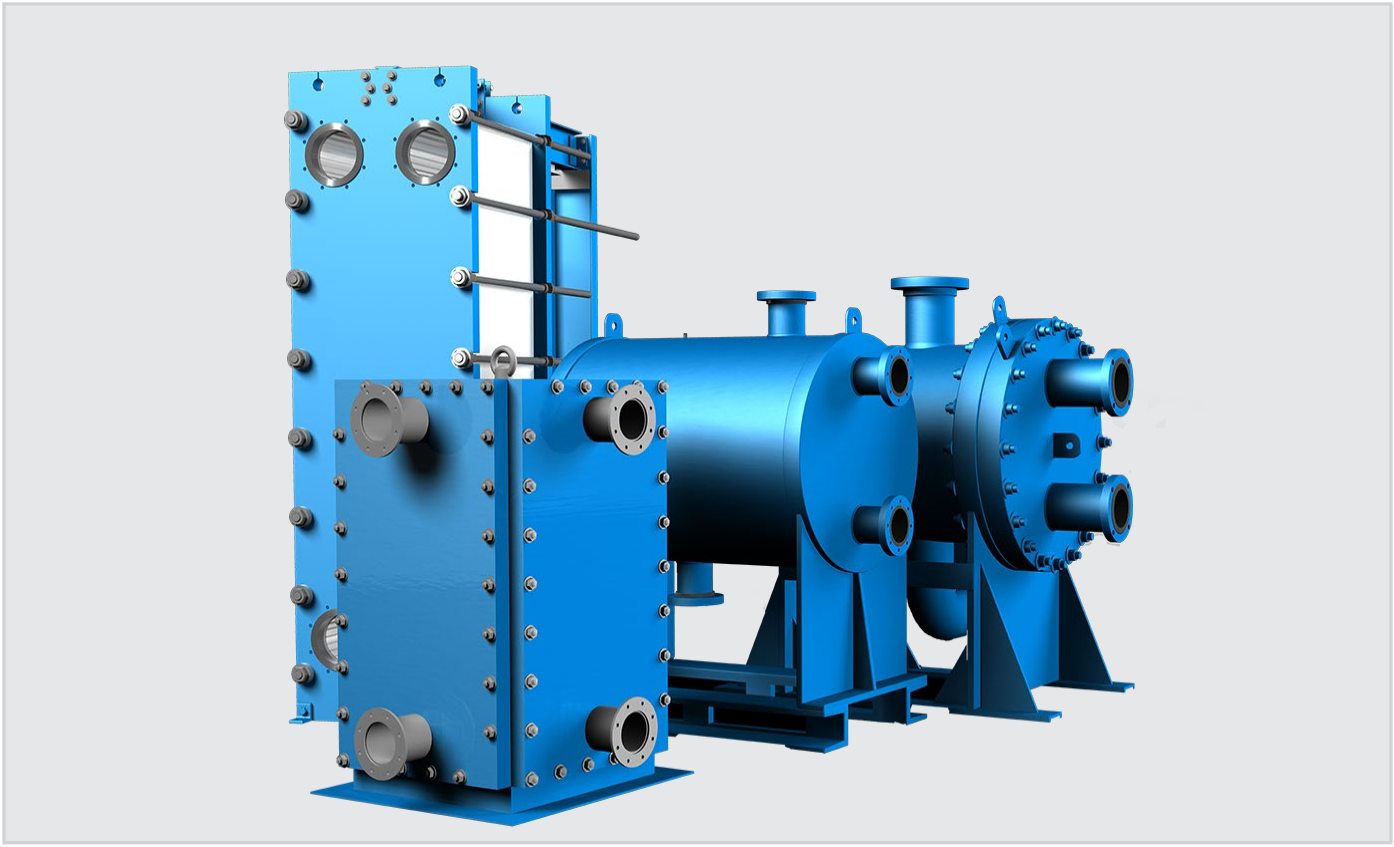
It consists of a series of gasketed, embossed metal plates arranged alternately and bolted together between end frames to form channels through which hot and cold media flow. The hot fluid flows on one side of the plate while the cold fluid flows on the other, with the plate itself providing the most effective means to transfer heat from one fluid to the other. Gaskets on the plates seal the channels and provide flow direction.

As liquids flow counter-currently through the channels between the plates, the cold liquid becomes warmer and the hot liquid cooler. Most units are designed for a one-pass/one-pass flow arrangement, resulting in all nozzles being installed on the stationary end frame, which facilitates simpler piping arrangements and easier disassembly.

Due to its high efficiency, the SUPERCHANGER unit can handle temperature approaches of less than 2°F (1°C). It also offers "U" values in excess of 1,500 Btu/hr ft^2 °F, which is significantly greater than other exchangers, due to the unique turbulence created by its corrugated plates, which eliminates stagnant areas in liquid flow and promotes maximum heat transfer. This translates to a less expensive and more compact heat exchanger.

The unit's velocity profile and induced turbulence causes dirty product deposits to be continually removed from the heat transfer surface during operation, thereby reducing fouling.

Effective use of the plate's turbulence can be made with in-place cleaning, which allows backflushing water or pumping cleaning solutions into the unit without disassembling. Units can also be taken apart for cleaning the plate surfaces. Plates can be electropolished to make cleaning easier, either manually or in-place.



SUPERMAX (right) Welded Plate Heat Exchangers joined by our SUPERCHANGER® Gasketed P&F (back) and NOVUSBLOC® Welded Plate Heat Exchanger

Applications

Oil & Gas Production And Refining
- Optimization of heat recovery, cooling, condensation, dehydration and reboiling systems
- Distillation column exchangers: fractionators, hydrocrackers, recrackers and hydrogen sulfide strippers
- Waste heat recovery and feed water heating
- LPG reliquefaction

Chemical Processing And Pharmaceuticals
- Optimization of condensation, heating/cooling, mist elimination, heat recovery and reboiling systems
- Evaporation, distillation and condensation of substituted olefins and aromatics, including halogenated compounds
- Thermal processing involving mineral acids and caustics
- Viscous processing with monomers and resins
- Soaps and detergents, paints and coatings
- Mineral oil heating and cooling
- Gas cooling and drying: chlorine, hydrogen, nitrogen, carbon dioxide
- Vapor and solvent recovery

HVAC And District Heating
- Steam and hot water heaters
- Heat recovery exchangers
- High temperature interchangers
- Water/glycol-cooled oil coolers
- Discharge gas desuperheaters for heat recovery

Emissions Control Systems
- Ammonia liquor scrubber coolers
- Flue gas heat recovery banks
- Flue gas reheating banks
- Mist elimination banks

Food Processing
- Vegetable oil heating
- Waste heat recovery

Power Generation
- Low pressure feedwater heaters
- Condensate exchangers and condensate trim coolers
- Blowdown heat recovery exchangers
- Condensers and vapor condensers
- Condensate subcoolers
- Evaporators
- Molten salt to thermal fluid interchangers
- Seal water coolers
- Closed cooling loop exchangers
- Component cooling water (CCW) exchangers
- Lube oil coolers
- Gland steam condensers
- Recuperators
- Economizers
- HRSG (Heat Recovery Steam Generator) cross exchangers

Refrigeration
- Flooded evaporators with surge drum, condensers, chillers
- Liquid chillers for flooded evaporation
- Flooded evaporators with pumped refrigerant feed
- Liquid-cooled condensers
- Cascade CO_2 condensers for flooded ammonia and other refrigerants
- Thermosyphon oil coolers
- Oil coolers and condensate subcoolers for flooded evaporation

Service Centers Help Keep Your Welded Units On Line

At Tranter Authorized Service Centers, we safely clean and refurbish your welded and gasketed plate heat exchangers, returning them to peak efficiency. Our centers guarantee their work with written warranties covering materials and workmanship.

We do pressure washing and chemical cleaning, plate core replacement, sandblasting and repainting, gasket replacement and hydro testing. With Tranter and its authorized service facilities, you can always be sure that you get the right parts, the friendliest service and our OEM Guarantee.

Our Service Centers are strategically located to support our installed heat exchanger base. Give us a call at (940) 723-7125 for the location most convenient to your facility.

TRANTER
MULTI-BRAND
SERVICE
& PARTS

At the forefront of heat exchanger technology for more than 85 years

Tranter top quality, high-performance, proprietary products are on the job in demanding industrial and commercial installations around the world. Backed by our comprehensive experience and worldwide presence, Tranter offers you exceptional system performance, applications assistance and local service. Tranter is close to its customers, with subsidiary companies, agents, distributors and representatives located worldwide. Contact us for a qualified discussion of your needs.

TRANTER®
The heat transfer people

North America
Tranter, Inc.
Texas, USA
Tel: +1 940 723 7125
E-mail: sales@tranter.com

South America
Tranter Ind e Com de Equip. Ltda
Sao Paolo, Brazil
Tel: +1 940 723 7125
E-mail: brasilsales@tranter.com

EMEA
Tranter International AB
Vänersborg, Sweden
Tel: +46-521-79 98 00
E-mail: sales.support.europe@tranter.com

India
Tranter India Pvt. Ltd.
Pune, India
Tel: +91 2137 392300
E-mail: salesindia@tranter.com

China
Tranter Heat Exchangers Co. Ltd.
Beijing, P.R, China
Tel: +86 1064379490
E-mail: info_cn@tranter.com

South East Asia & Oceania
Tranter Heat Exchangers
Singapore, Singapore
Tel: +65-8299-2212
E-mail: info_sea@tranter.com

www.tranter.com

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