

Plate & Shell®
Plate & Ring®



Fully welded heat exchangers for Refrigeration



Vahterus Plate & Shell® Heat Exchangers have many benefits for advanced refrigeration applications such as evaporators, condensers, cascades, desuperheaters and oil coolers.

Plate & Shell® Heat Exchangers are effective, durable & versatile due to their unique shell construction together with fully welded plates. This makes them also ideal for contractors who need compact size and low refrigerant charge.

Vahterus Heat Exchangers are suitable for all refrigerants, especially for natural media such as ammonia and carbon dioxide.

Main Applications

Evaporators

The versatility of Vahterus Plate & Shell® Heat Exchangers is demonstrated especially in evaporator applications. Plate & Shell® can be used as flooded or as direct expansion (DX) evaporators efficiently due to low pressure drop and good heat transfer. Fully welded circular plates and protective outer shell guarantees safety for the end user. This construction also ensures high integrity & durability.



Flooded evaporators

- Capacity range: 5 - 20 000 kW
- Small pressure drop on evaporation
- Many possibilities for shell side connection: inlets & outlets, level controls and sight glass
- High efficiency



Flooded evaporators + droplet separators

- Capacity range: 100 - 5000 kW
- Compact size & small refrigerant charge
- Possibility for internal & external circulation
- Many options available on shell connections
- Safe operation



Direct expansion evaporators

- Capacity range: 5 - 1500 kW
- For all refrigerants
- Small size
- Safe operation



Cascades

Cascade heat exchangers are used to transfer heat between two refrigerants. They are used especially with CO₂. A cascade unit combines both condenser and evaporator (flooded or DX).

Vahterus Plate & Shell® is ideal for cascade operation due to their high thermal efficiency, which gives minimum temperature difference between the evaporator and condenser, and low running costs. The fully welded construction ensures there is no leakage or cross contamination.



- Refrigerants: NH₃, CO₂, R404, R134a, propane, methane, etc.
- Capacity: 5 kW - 10 000 kW/unit
- Compact size & small refrigerant charge
- High heat transfer
- Low pressure drop
- Many material alternatives
- Easy to install & insulate

Condensers

Due to ideal construction, the Vahterus Plate & Shell® will work efficiently as a condenser with very low pressure losses. Vahterus Plate & Shell® condensers have small refrigerant charge. Plate & Shell® is suitable for all refrigerants in a wide capacity and temperature range.



- Refrigerants: NH₃, CO₂, R404, R134a, propane, methane, etc.
- Capacity: 5 kW - 10 000 kW/unit
- Many material alternatives
- Easy to install & insulate

Other applications



Desuperheaters



Oil coolers



Ammonia absorption plants

Compact & Effective

The Plate & Shell® construction combines the best features of the Plate and Frame and Shell and Tube heat exchangers. At the heart of the Plate & Shell® Heat Exchanger is a fully welded pack of circular plates. This pack is housed within a shell, which is a pressure vessel.

The Vahterus sizing program can perform thermal and strength calculations, dimensional drawing generation and commercial based calculations.



Plate & Shell®, Fully Welded



Plate & Shell®, Openable



Plate & Shell®, Compact



Benefits of Plate & Shell®

- Easy to insulate
- Flexible & customer orientated
- Low pressure drop & high k-value help to optimise solution
- Fully welded construction; no gaskets or brazing
- Compact size & small refrigerant charge
- Safe & reliable
- Suitable for all refrigerants
- Durable & efficient
- Innovative & versatile

Technical specifications:

Maximum heat transfer area:

- 1500 m²/unit

Design pressure:

- Standard design 16, 25, 40 bar
- Up to 100 bar

Design temperature:

- Standard design - 80 - + 400 °C, others by request

Main data:

	Area/plate, m ²	Plate side nozzles, DN	Shell side nozzles, DN
PSHE 2	0.032	25	20-80
PSHE 3	0.076	50	25-250
PSHE 5	0.26	100	25-350
PSHE 9	0.80	200	25-700
PSHE 14	1.55	300	25-1000
PRHE 12	1.00	200	600

Quality system:

- ISO 9001:2000
- EN 729 Quality Control
- PED Module D



Approvals:

- ABS Europe Ltd
- ASME U Stamp
- Bureau Veritas
- CBPVI, China
- Det Norske Veritas
- Germanischer Lloyd
- KHK, Japan
- Lloyd's Register
- R.I.N.A.

Materials:

Shell:	Plates:
• St 35.8	• AISI 316L
• AISI 316L	• AISI 904L
• AISI 904L	• 254 SMO
• 254 SMO	• Hastelloy
• etc.	• Duplex
	• Titanium
	• Nickel
	• etc.



Vahterus Oy
Pruukintie 7
FIN-23600 Kalanti
Finland

Tel. + 358 2 842 7000
Fax + 358 2 842 7029
sales@vahterus.com

Vahterus Deutschland GmbH
Magnolienweg 26
D-63741 Aschaffenburg
Germany

Tel. + 49 6021 181 700
Fax + 49 6021 181 7018
webmaster@vahterus.de

Vahterus (UK) Ltd
12-14 Derby Road
Melbourne
Derbyshire DE73 1FE
United Kingdom
Tel. + 44 1332 863 175
Fax + 44 1332 863 031
vahterus.uk@vahterus.com