



Plate & Shell Heat Exchangers



## Oil & Gas Industries

Vahterus Plate & Shell (PSHE) Heat Exchangers combine the benefits of traditional heat exchangers. Utilising a fully welded plate pack within a strong shell construction makes Vahterus PSHE the most compact, thermally efficient and cost effective

heat transfer solution in many Oil & Gas applications. PSHE is an ideal solution for Upstream Processes, such as Oil & Gas Production, Handling and Transportation; and Downstream Processes, such as Refineries and Petrochemical Plants.

# Fully Welded Plate & Shell Technology

## The Perfect Solution for Upstream and Downstream Processes



### Oil & Gas Production

- Crude Oil Coolers and Heaters
- Gas Coolers and Heaters
- Amine Coolers
- Heat Exchangers for Dehydration Packages
- Refrigeration Applications

## Oil & Gas Production



5530 kW Crude Oil Cooler operating on a Production Platform, PSHE 9HH-324/1/1 (titanium plates)



1465 kW Crude Oil Inlet Heater for a Crude Oil Testing Vessel, PSHE 5HH-412/1/1 (91 bar design)



2135 kW 2<sup>nd</sup> Stage Suction Cooler (sweet natural gas) operating on a Gas Production Platform, PSHE 7HH-256/1/1 (55 bar design, titanium plates, duplex shell)



190 kW Lean/Rich TEG Interchanger operating on a Gas Production Platform, PSHE 5HH-220/1/1 (duplex shell)



### Oil & Gas Handling and Transportation

- Oil Heaters and Coolers
- LPG Coolers and Heaters
- LPG Condensers
- Heat Exchangers for Gas Treatment Facilities in Gas Terminals

## Oil & Gas Handling and Transportation in Vessels and Terminals



1290 kW LPG Cargo Condenser on LPG Vessel, PSHE 9LL-222/1/1 (titanium plates)



4800 kW LPG Cargo Heater on LPG Vessel, PSHE 9LL-222/1/1 (titanium plates)



695 kW LNG BOG Heater in a Gas Terminal, PSHE 5LL-124/1/1 (-125 to 200°C Design Temperatures)



1200 kW Lean/Rich TEG Interchanger and 290 kW Liquid Ring Water Cooler for an Onshore Gas Terminal, PSHE 5HH-276/3/3 and PSHE 5HH-103/3/3



Plate & Shell, Fully Welded

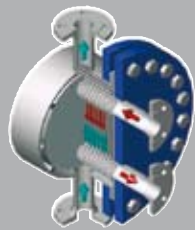


Plate & Shell, Openable

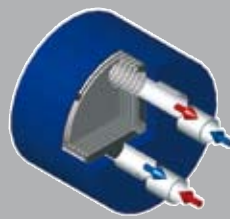


Plate & Shell, Compact

## Refineries



1700 kW Gasoline Cooler in Oil Refinery, PSHE 7HH-354/1/1



480 kW Raffinate Stripper Bottoms Cooler, PSHE 5HH-148/1/1



5500 kW Gasoline Partial Evaporator in Oil Refinery, PSHE 5HH-544/4/4



### Refineries

- Heaters
- Coolers
- Condensers
- Evaporators
- Cascade Evaporators

## Petrochemical Plants



660 kW Benzene Condenser, PSHE 5HH-126/1/1



500-1000 kW Multipurpose Cooler, PSHE 5HH-106/1/1



### Petrochemical Plants

- Heaters
- Coolers
- Condensers
- Economizers
- Evaporators



5400 kW Propane Condenser at Polymer Plant, PSHE 9HH-622/1/1



30 MW Effluent Economiser at Ethylene Oxide Plant, PSHE 14HH-968/2/2



Vahterus provides solutions for many heat transfer needs. We have considerable experience with heat transfer technology and continually invest in Research & Development.

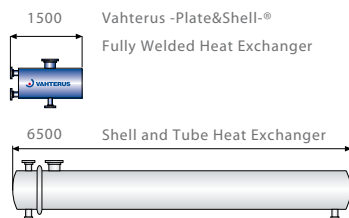
High quality, consistent and reliable products are a matter of principle to us.

## Compact & Effective

Vahterus PSHE combines the benefits of Plate & Frame and Shell & Tube heat exchangers. PSHE can either be described as a fully welded, high integrity plate heat exchanger, with no gaskets; or a generic alternative to Shell & Tube, approx. 25% of the footprint, displaying both space and weight benefits.

### Benefits of PSHE

- No Gaskets or Brazing
- High Integrity / Total Containment
- Strong and Safe Construction
- Unique Protection and Resistance to Thermal and Pressure Cycling
- Thermally Efficient
- Compact and Low Weight
- Flexible Construction
- Proven, Reliable Technology
- Low Fouling
- Minimal Maintenance Requirement
- Close Approach Temperatures



### Technical Specification

#### Maximum Heat Transfer Area

- 2000 m<sup>2</sup>/exchanger

#### Mechanical Design

- Full vacuum to 200 bar possible
- -200 to +900°C

### Quality Systems:

- ISO 9001:2000
- EN ISO 3834-2
- PED Module B+D
- ASME U Stamp
- OHSAS 18001
- ISO 14001



### Approvals:

- PED
- ASME U Stamp
- SELO, China
- AD-2000 HP0
- Germanischer Lloyd
- Lloyd's Register
- R.I.N.A
- ABS Europe Ltd.
- Bureau Veritas
- DNV

### Materials:

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

### Main Data:

	Area/plate, m <sup>2</sup>	Plate side nozzles, DN	Shell side nozzles, DN
PSHE 2	0.032	25	20-80
PSHE 3	0.076	50	25-250
PSHE 4	0.15	80	25-300
PSHE 5	0.26	100	25-350
PSHE 7	0.46	150	25-500
PSHE 9	0.80	200	25-700
PSHE 14	1.55	300	25-1000
PRHE 12	1.00	200	25-1000



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