

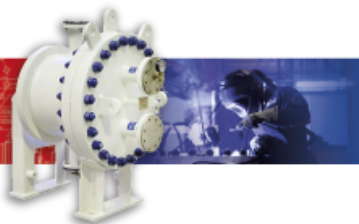
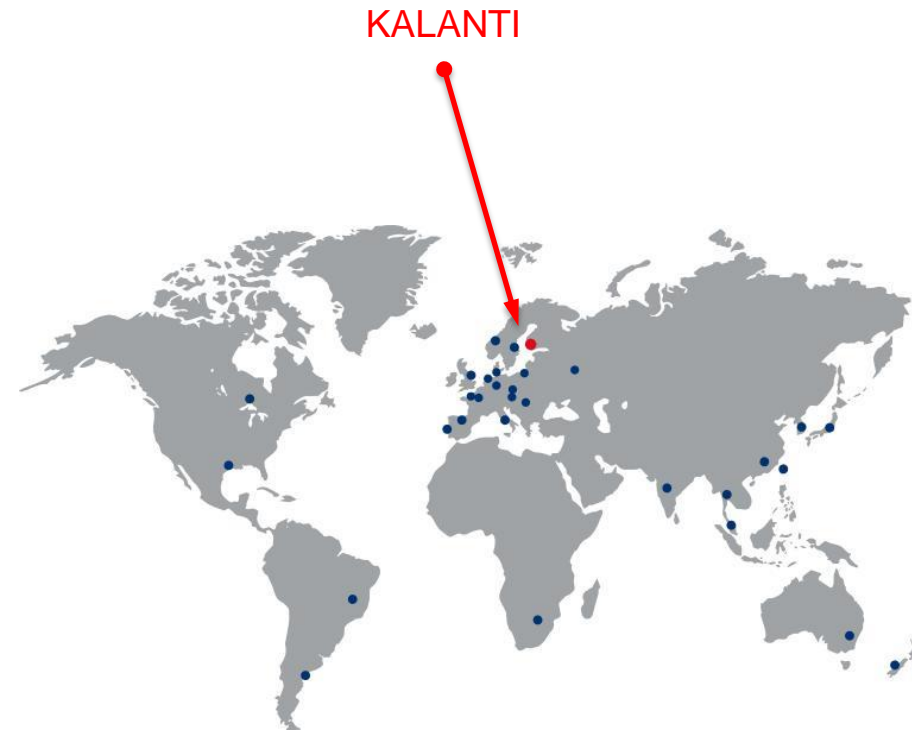


The Plate & Shell Innovator 2017

Tobias Häggblom

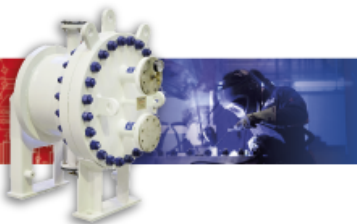
FINNISH COMPANY

- Established in 1990
- Privately owned
- Subsidiary companies in UK, Germany, USA and China
- Global distributor network in over 50 countries
- Over 95% products exported from Finland



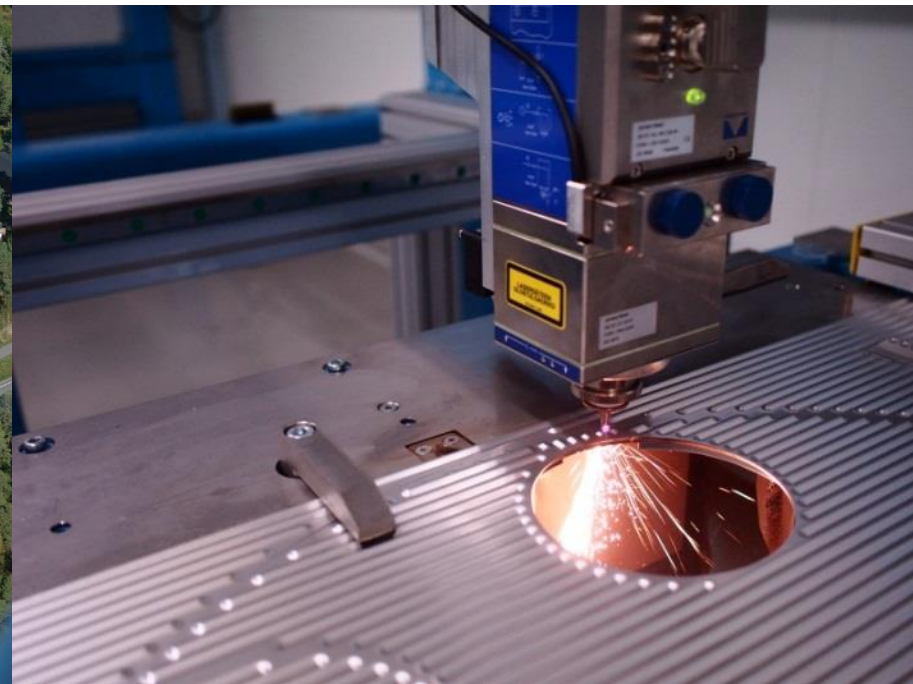
How it all started 1990

- The first Plate&Shell heat exchangers under production



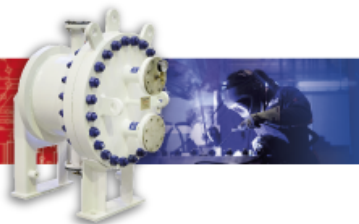
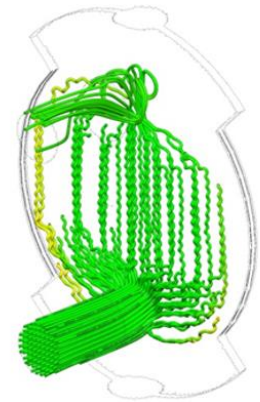
27 years and 45 000 heat exchangers later

- 12 000 m² production & 2 500m² office space
- all automatec welding
- lazer cutting



VAHTERUS R & D

- Steam test laboratory
- Refrigeration test lab with ammonia and CO²
- Liquid/liquid performance test
- Metallurgical Lab
- Thermal chock testing with N²
- Burst test
- In house CFD simulations



INVENTOR OF PLATE & SHELL HEAT EXCHANGER



Plate and Frame HE

- + Compact
- + Low fouling
- + Close approach temperatures
- Low pressure
- Low temperature
- Gasket



Shell & Tube HE

- + High pressure
- + High temperatures
- + No gaskets
- Large size & weight
- High fouling

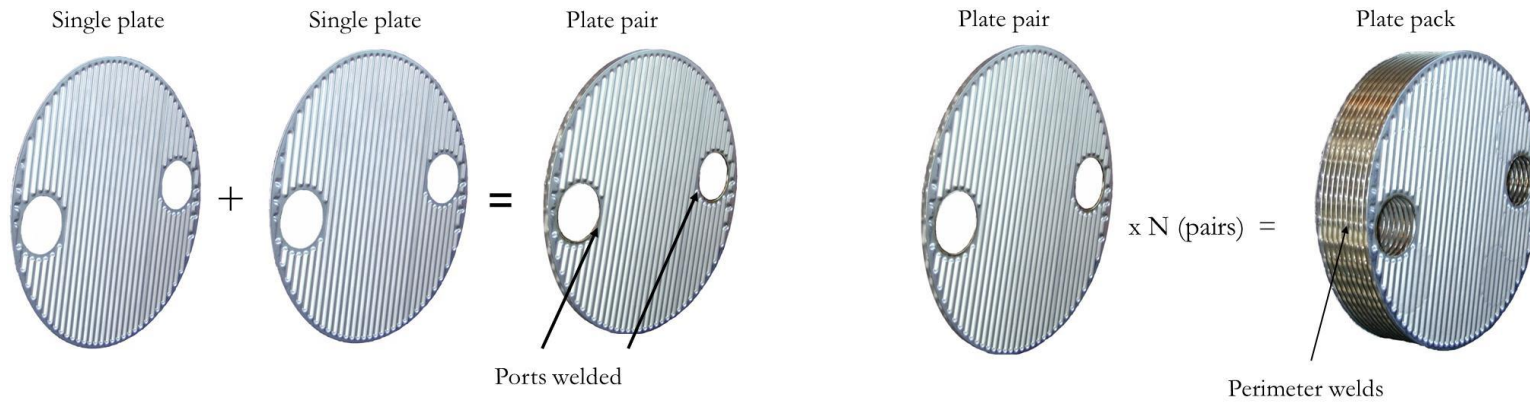


Vahterus PSHE

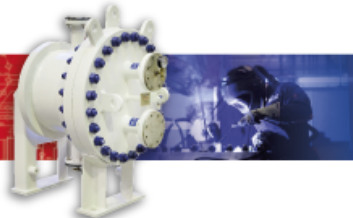
- + High pressure
- + High temperatures
- + No gaskets
- + Compact
- + Low fouling
- + Close approach temps

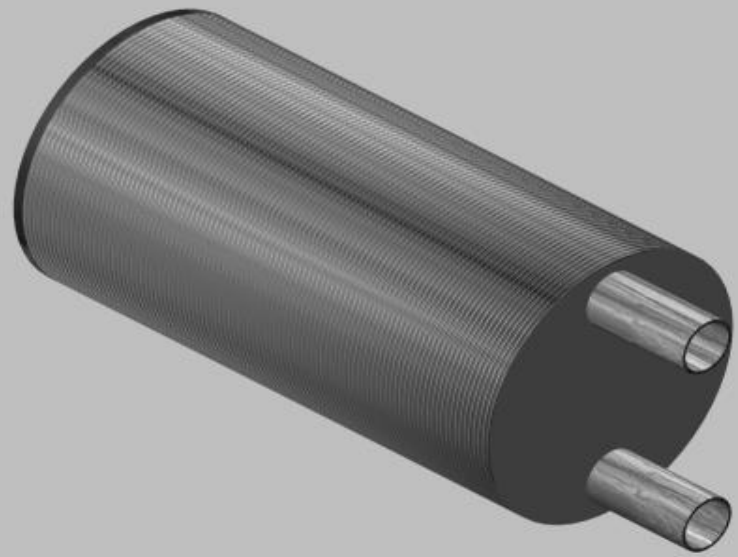


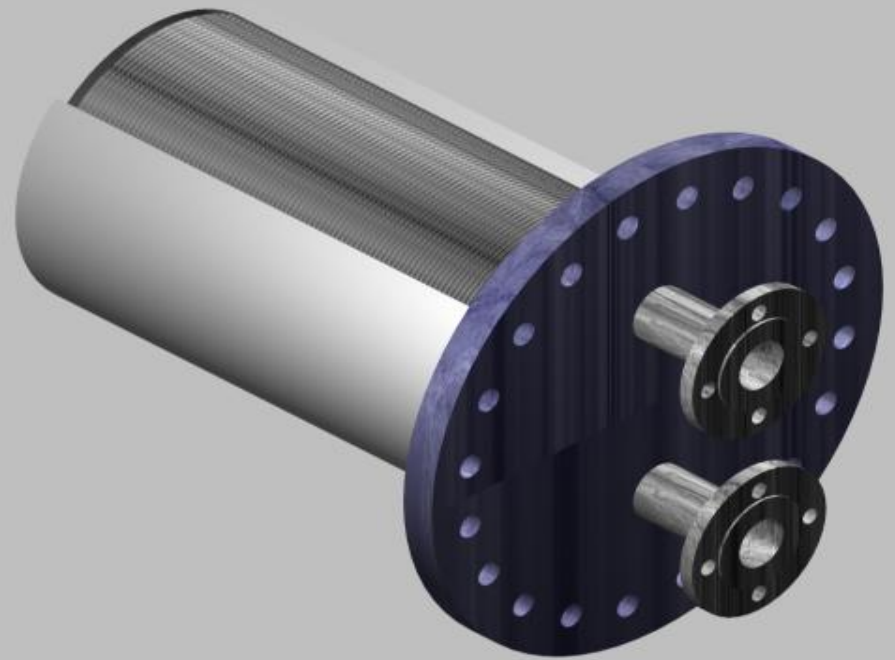
PLATE PACK CONSTRUCTION

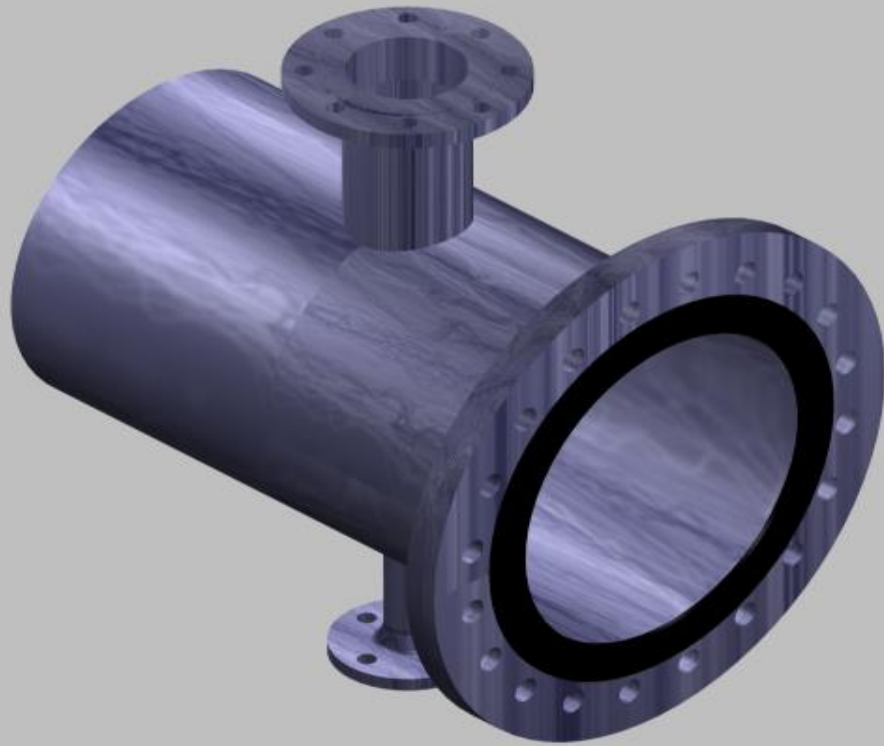


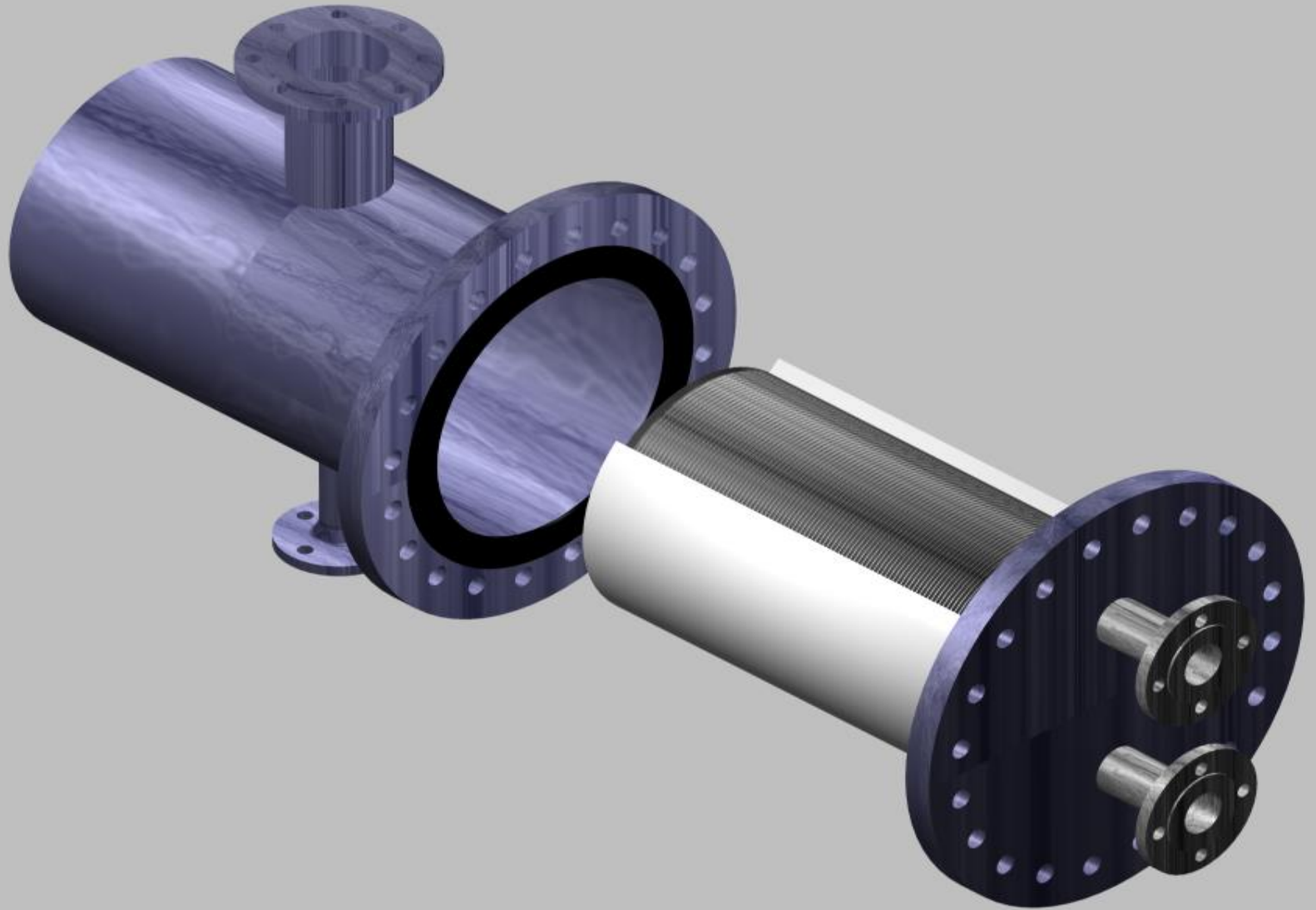
	Area/plate m ²	Plate Ø	Plate side nozzles, DN	Shell side nozzles, DN
PSHE 2	0,032	190	25	20-80
PSHE 3	0,076	300	50	25-250
PSHE 4	0,15	440	80	25-300
PSHE 5	0,26	556	100	25-350
PSHE 6	0,37	650	125	25-500
PSHE 7	0,46	740	150	25-500
PSHE 9	0,80	998	200	25-700
PSHE 12	1,00	1214	200	600
PSHE 14	1,55	1358	300	25-1000

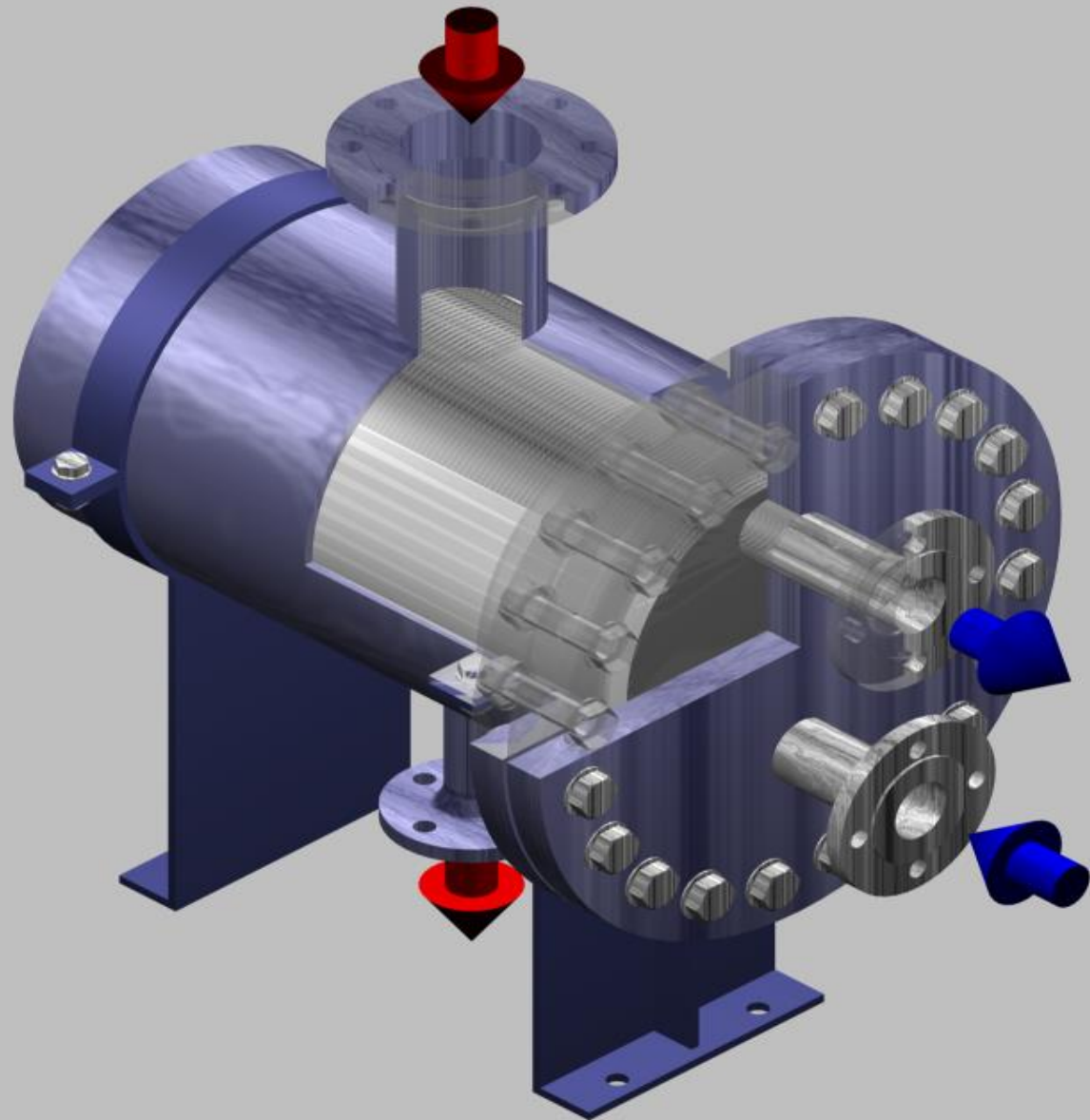




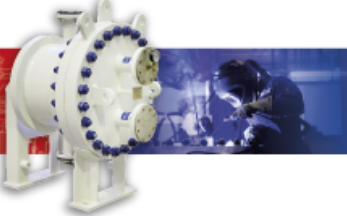
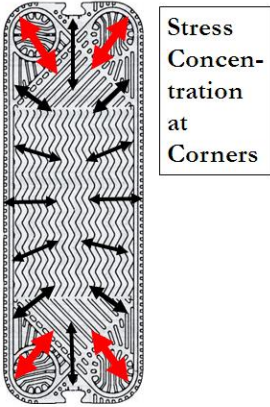
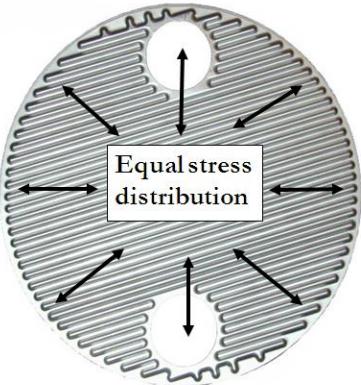
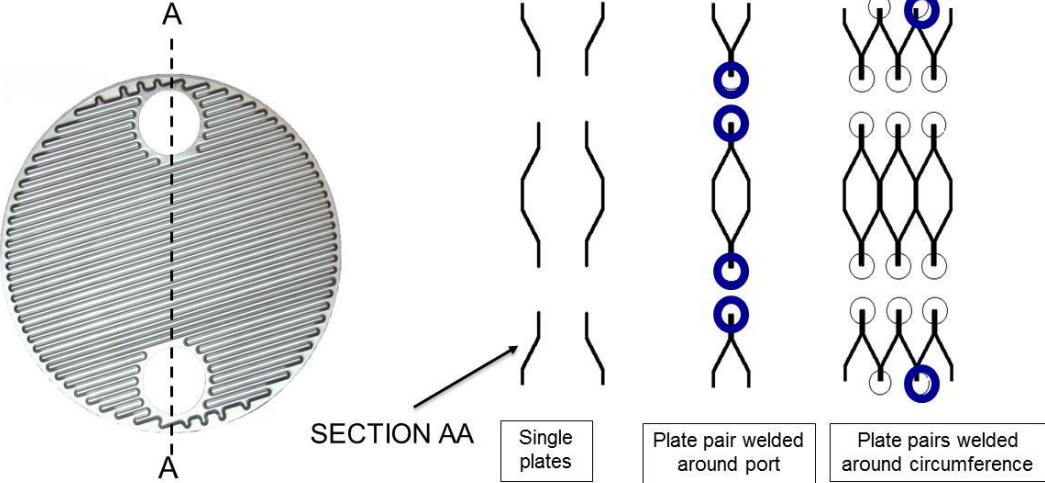




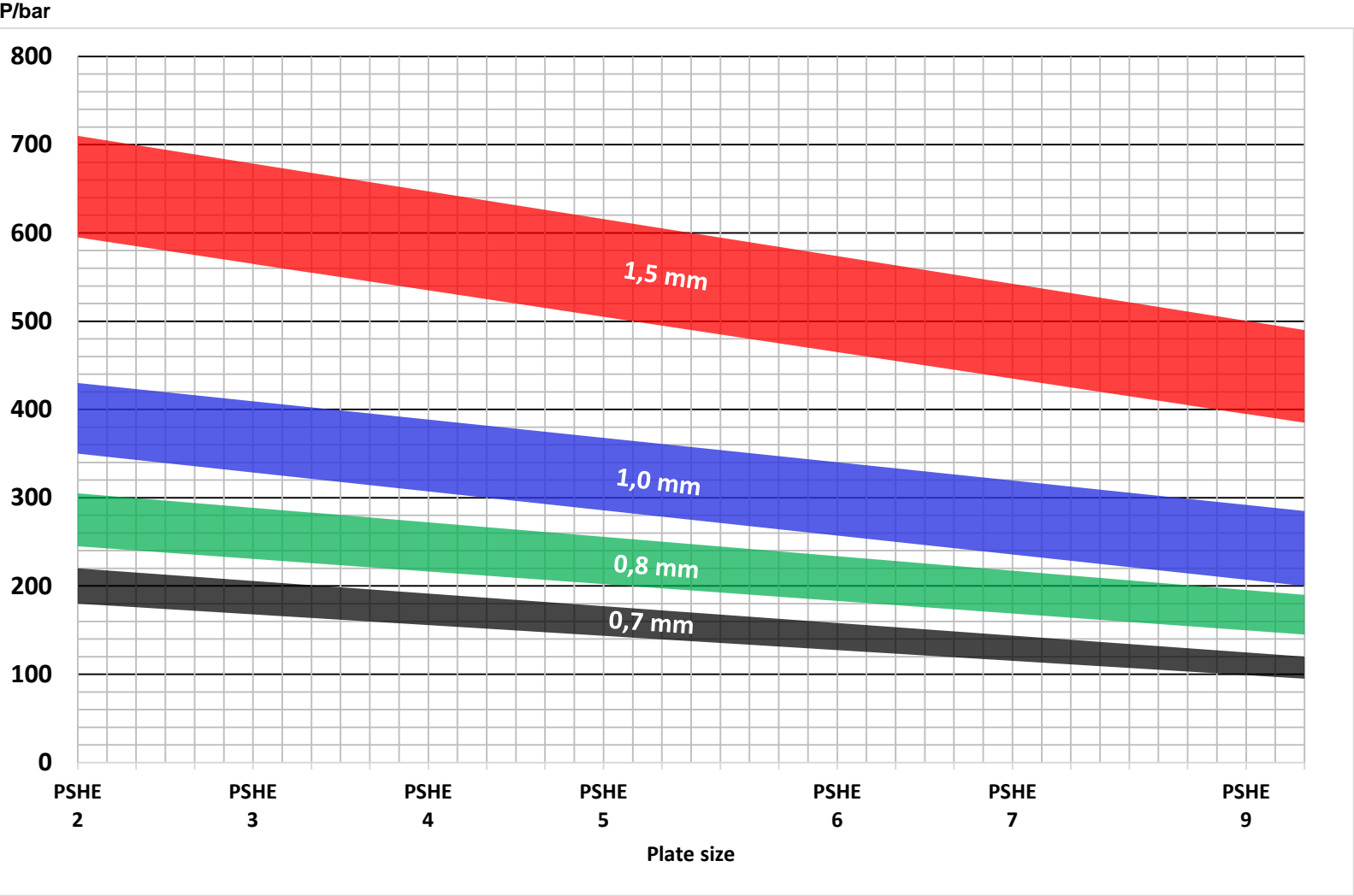




RESISTANCE AGAINST THERMAL & MECHANICAL STRESS



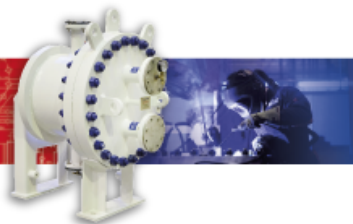
BURSTING PRESSURE WITH 316L



COST & SPACE SAVING



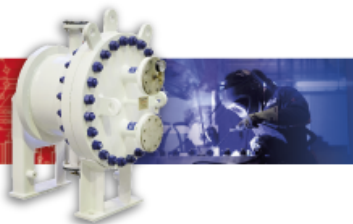
- PSHE 9HH-348/1/1
- S&T 4MW -> PSHE 8 MW steam condenser
- Steam 0,9 barg / District heating water 64/110°C



Vahterus Plate&Shell in ORC systems

130 units delivered

- Condensers
- Recuperators
- Evaporators
- Pre heaters
- Exhaust gas economizers



Power Plants

Feed Water pre heater



Oil & Gas

Gas Cooler



Refrigeration

Flooded NH3 evaporators



LNG

Vent Gas Heater



Marine

Dumping Condensers



Chemical & Process

Feed Water pre heater



What is new?

- Thicker plate materials due to improved manufacturing technology
- New materials available FDX Duplex
- Inline weld testing
- CFD is speeding up the development for new plate types



Thank You!

