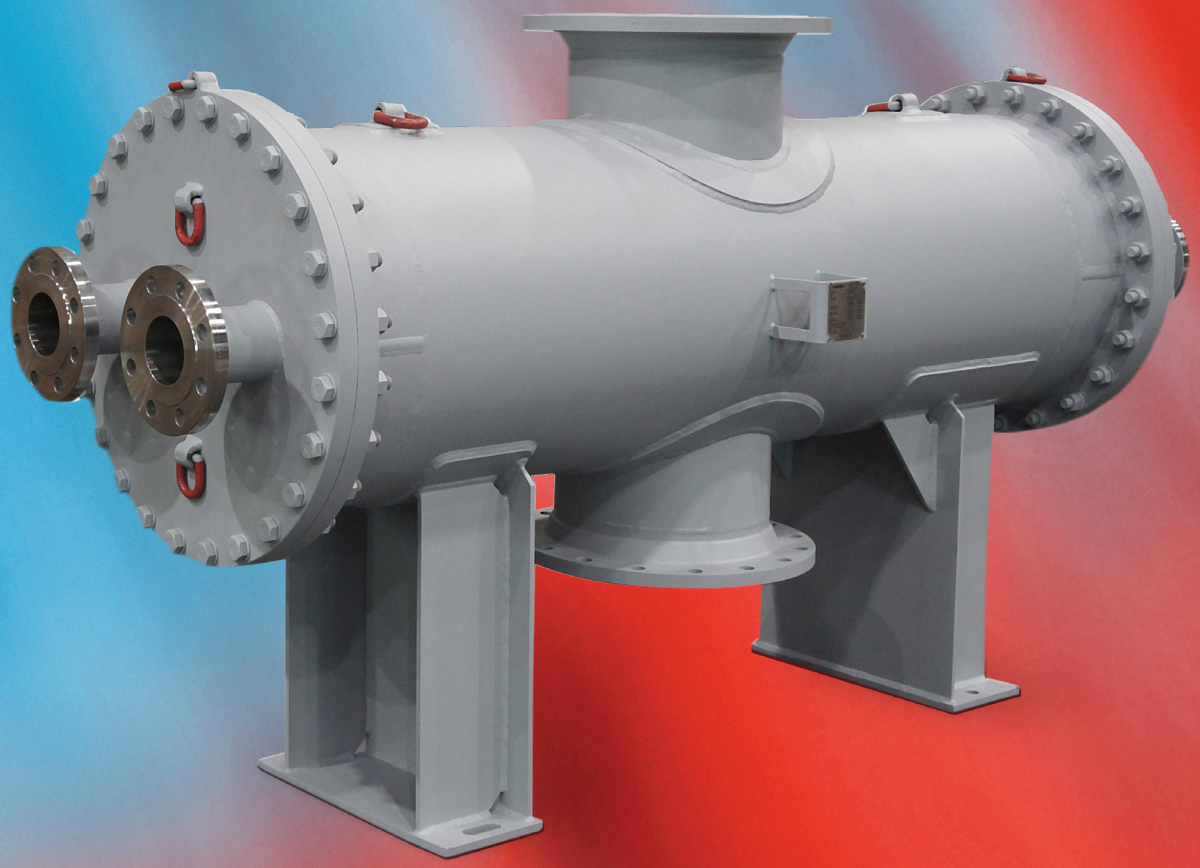
Schmidt

AN API HEAT TRANSFER COMPANY

SCHMIDT® SIGMASHELL

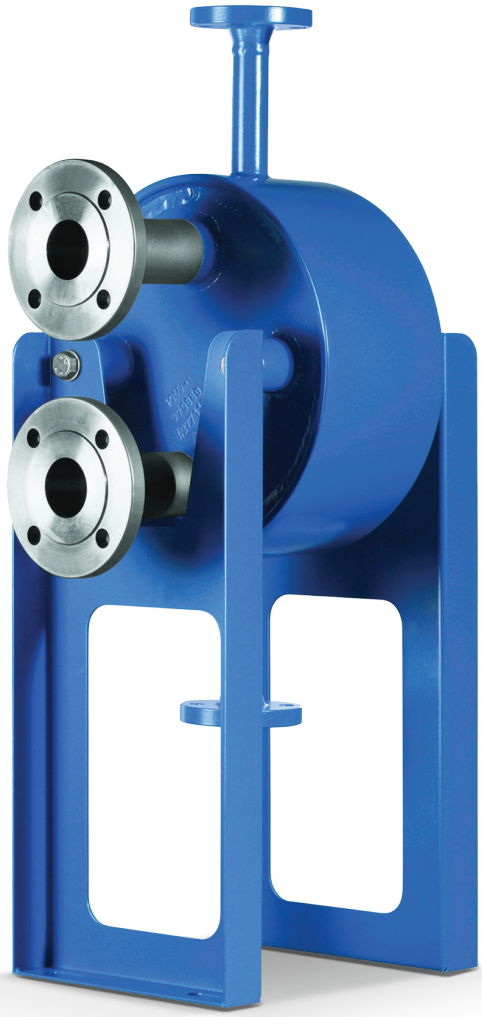


Schmidt® SIGMASHELL All-Welded Plate & Shell Heat Exchanger

Our SIGMASHELL all-welded plate and shell heat exchangers offer a unique combination of the ruggedness and high-pressure capability of a shell and tube with the compactness and high thermal efficiency of a plate heat exchanger.

Features:

- Cylindrical shell design to handle high-pressure applications
- High thermal efficiency and surface density
- Fishbone corrugation for superior high and low heat transfer characteristics
- Shell construction flexibility
  - All-welded for a gasket-free design
  - Accessible to one or two sides for easy inspection and cleaning
- Multi-pass possible for shell and plate side
- Thermal plates available in stainless steel, titanium and Hastelloy®



Benefits:

- Quick start-up time
- Very resistant to thermal shock
- Ideal for high temperature and pressure applications
  - Operating pressures from vacuum to 150 barg = 2176 psig
  - Operating temperatures from -200° C = -328° F to 500° C = 1022° F
  - Viscosities up to 8,000 mPas
- Compact, lightweight design to minimize volumetric hold-up
- Easy to maintain
- Small footprint

Quality Construction Ensures Superior Performance and Reliability

Our Schmidt® SIGMASHELL is a laser-welded design, providing greater cross-sectional weld area at minimum heat input and resulting in little change to material microstructure. Its smaller weld pool volume reduces the risk of sink holes and pores during solidification to prevent leaks.

Our laser welding is more capable and stronger against failures along the circumferential weld seams. These advantages result in plate packs with a higher degree of integrity and a longer life cycle.

Dimensions

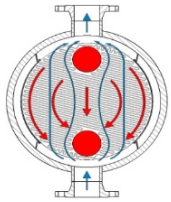
	SP 50	SP 100	SP 150	SP 200	SP 300
S1, S2	3/4" - 4"	1" - 10"	2" - 14"	2" - 28"	2" - 24"
P1, P2	2"	4"	6"	8"	12"
Ø [mm]	360	610	890	1,100	1,400
L [mm]	from 150 (depending on number of plates and design pressure) to 2,400				
Area [m²]	1.5 to 30	max 100	max 320	max 500	max 700

Wide Range of Industry Applications:

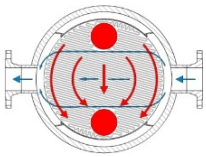
- Chemical
- Petrochemical
- Pharmaceutical
- Power
- Alternate Energy
- Steel Mills

Construction and Function

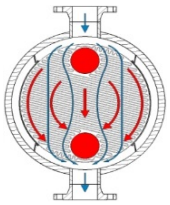
Countercurrent flow

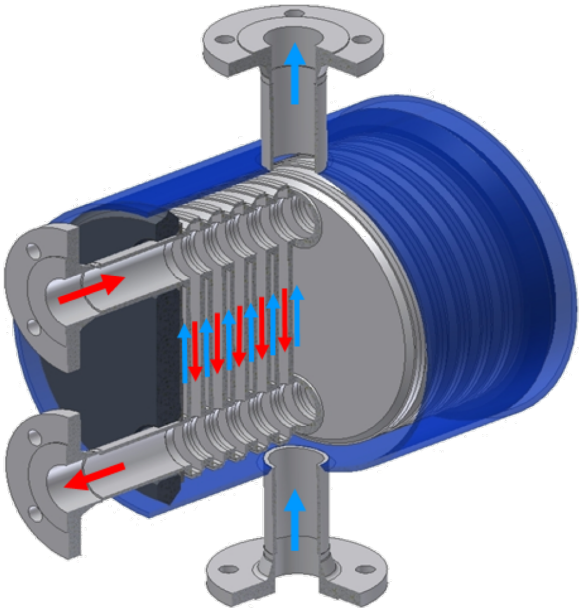


Cross flow



Co-current flow





Inlet and outlet on both sides

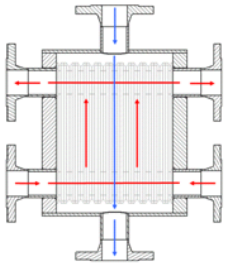
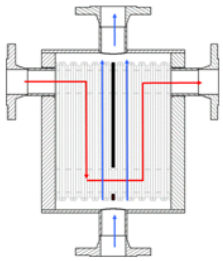
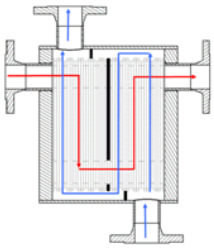


Plate side deflection



Shell and plate side deflection



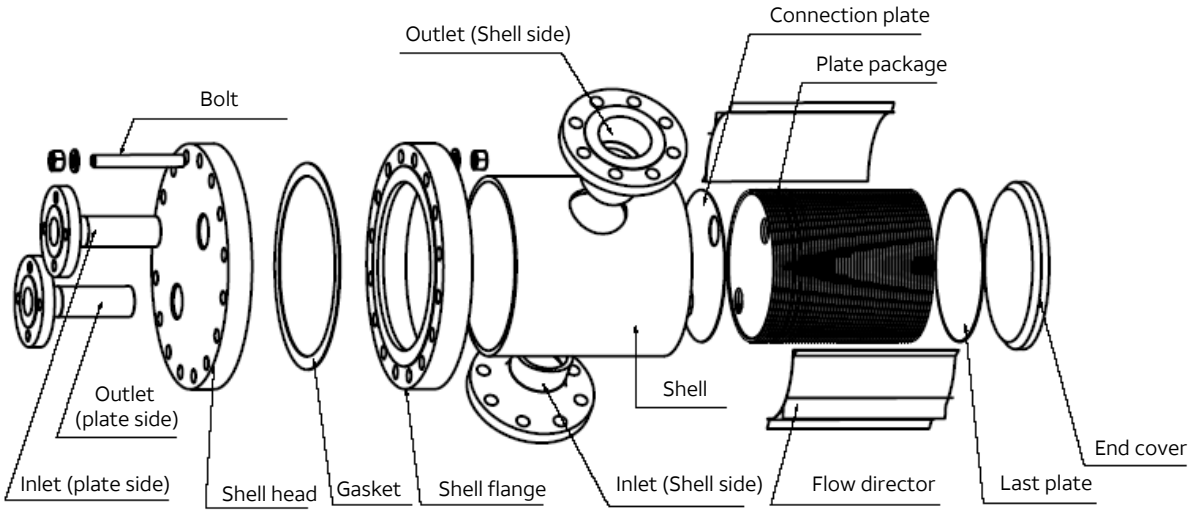


Plate Patterns

H-Plate

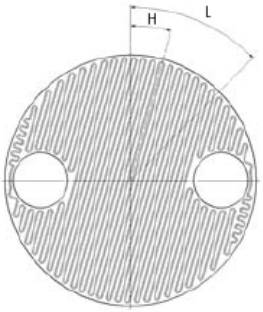
- Small angle
  - Higher transfer efficiency

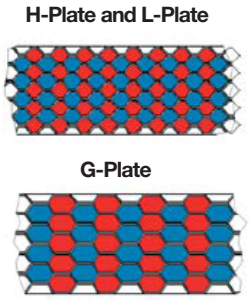
L-Plate

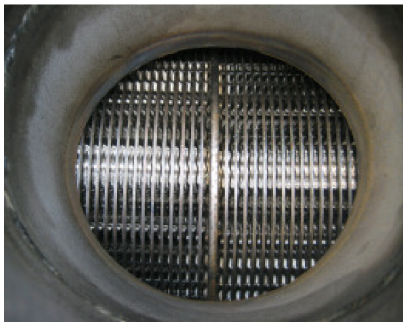
- Wide angle
  - Less pressure drop

G-Plate

- Deeper corrugation depth and bigger channel width
  - Bigger cross section

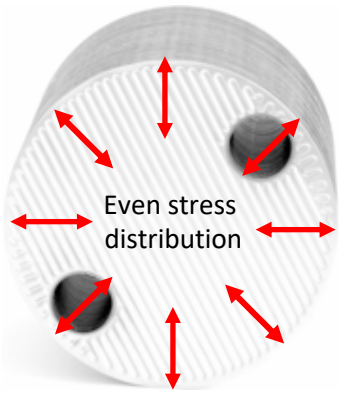


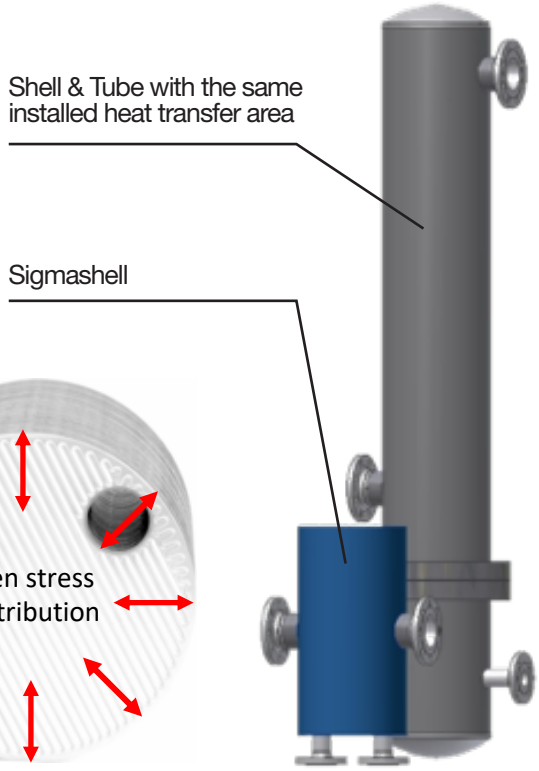




Compact Design

- More heat transfer surface with less space
  - Smaller footprint
- Even distribution of the stress
  - Minimized risk of the stress cracking cylindrical shell
  - Optimal design for pressure vessel
  - Small thickness, low weight



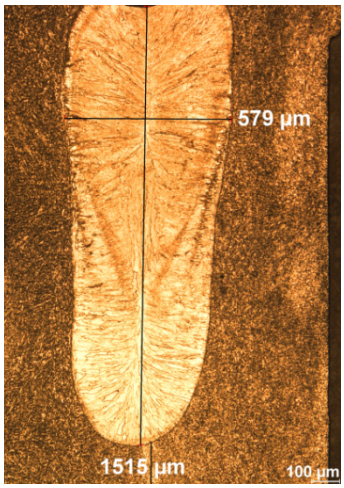


Accessible Plate Package

- Inspection and cleaning up the plate package by opening the shell

Plate Package

- Laser-welded round plate pack
- Latest technology for shell & plate heat exchangers
- Huge joining cross section
- Minimal heat input
- Small heat-affected zone, small change in the material structure
  - Round laser-welded plate package shows an improved safety against leakage and less corrosion potential compared to other shell & plate heat exchangers
  - Higher design pressure can be achieved



Cleaning of Heat Exchangers

When cleaning heat exchanger plates, fouling layers are removed from the heat transfer surface, i.e., deposits formed during operation, which hinder the heat transfer. During operation any combination of the following kinds of fouling are possible:

- Crystallisation fouling
- Particle fouling (also sedimentating fouling)
- Corrosion fouling
- Biological fouling

For welded plate heat exchangers basically two cleaning methods can be used:

Chemical cleaning

Depending on the design of the Plate & Shell heat exchanger, chemical cleaning can be differentiated in:

- CIP cleaning (Cleaning in Place), for openable and fully welded units
- Immersion bath cleaning

  The immersion bath cleaning is only applicable to plate packages in openable Plate & Shell heat exchangers.

Mechanical cleaning

Depending on the design and installation of the Plate & Shell heat exchanger, mechanical cleaning methods can be differentiated as:

- Back flushing
- High-pressure cleaning

The high-pressure cleaning is only applicable to openable units. The disassembled plate pack is cleaned by steam or high-pressure water jet (800 to 1000 bar).

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API Heat Transfer, a family of high-performance brands

High-performance heat transfer.

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