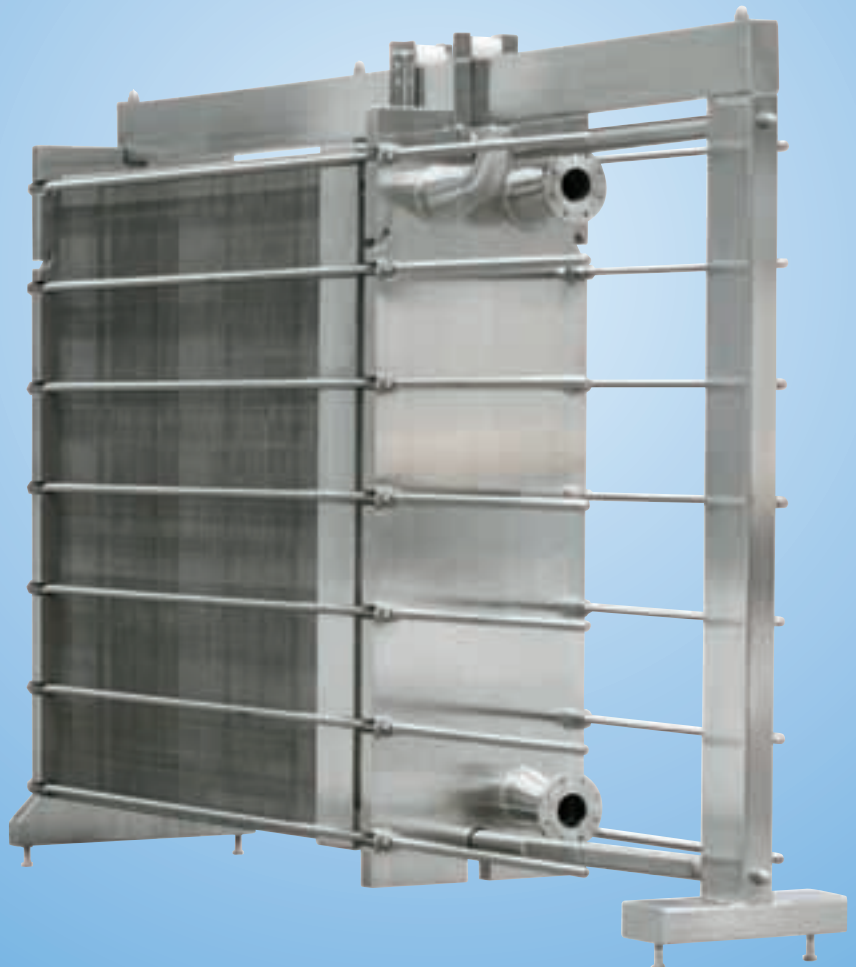


## Reliable quality control – F series

### thermowave Hygiene version

thermowave offers plate heat exchangers in a special hygiene version which have already proved their value in the drinks and foodstuffs industry in many cases:

The thermoline® F-series offers apparatuses equipped of particularly high quality, which ensure both the quality of the products being processed as well as being reliable with regards to corresponding production conditions and cleaning processes.



### thermoline® hygiene version

Plate heat exchangers from the thermoline® F-series are optionally available with frame plates cased in stainless steel or plates made from solid stainless steel which are assembled exclusively with stainless steel tightening bolts and nuts.

A first-class finish with a glass bead blasted surface really sets thermoline® apparatuses apart. We can also equip your apparatuses with smoothed surfaces on request.

## TL 50 – 1100 F

As plate heat exchangers are often flexibly used in the foodstuffs industry, we offer our thermoline® F-series apparatuses with height adjustable sanitary feet as well as rapid release connections, such as the dairy screwed pipe joint according to DIN 11851 and further connection variants.

National and international specifications on apparatus construction in food technology will of course be taken into account when choosing plates and gaskets for the thermoline® F-series.

plate type	dimensions (mm)							connections	max. operating pressure bar	max. heat transfer surface m <sup>2</sup>	total dead weight kg	max. volume per side dm <sup>3</sup>
	H	B	L	h1	h2	h3	b					
50	678	450	250-2000	194	363	0-110	125	DN 40	-1 to 25	33	120-600	36
90	880	450	250-2000	194	565	0-110	125	DN 40	-1 to 25	33	120-600	36
150	1140	450	250-2000	194	825	0-110	125	DN 40	-1 to 25	53	160-830	57
200	1124	575	500-2500	318	619	0-280	212	DN 80	-1 to 25	70	215-1100	190
250	1265	650	500-4000	316	774	0-280	256	DN 100	-1 to 25	82	510-1820	120
400	1712	575	500-4000	318	1207	0-280	212	DN 80	-1 to 25	115	390-2100	230
500	1745	650	500-4000	316	1255	0-280	256	DN 100	-1 to 25	280	690-4160	370
650	2000	900	500-4000	370	1153	0-280	305	DN 200	-1 to 25	300	700-4700	470
850	2340	900	500-4000	370	1693	0-280	305	DN 200	-1 to 25	500	1000-7000	700
1100	2410	1164	500-4000	453	1670	0-300	274	DN 250	-1 to 25	661	1900-9500	1125



## Your advantages

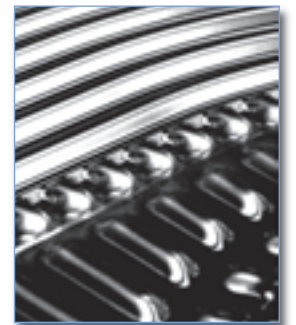
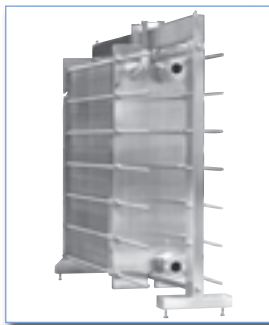
- compact design, low space requirements, low weight
- modular system offers high degree of flexibility, capacity adjustment by adding or removing plates
- easy to clean
- quick and low cost installation
- easy to maintain
- high specific thermal efficiency, suitable for low temperature differences
- excellent fouling resistance due to high turbulence and smooth surfaces
- high resistance to corrosion

## Working principle

The media involved in the heat exchange process, are fed into the plate pack via connections on the fixed and movable pressure plates. The arrangement of the plates creates two separate channel systems, enabling the two media to flow past and between each other without physical contact, leaving the exchanger again via connections in the pressure plates.

Plates with different patterns can be mixed in the heat exchanger in order to achieve optimum efficiency at a given pressure drop. By installing special distribution plates in the plate pack, the media can be conducted several times through the flow channels, and thus participate longer in the heat exchange process. Therefore, very high NTU rates, are achieved in a compact unit.

- 1 – fixed pressure plates
- 2 – starter plate
- 3 – heat exchanger plate with gasket
- 4 – end plate
- 5 – movable pressure plate
- 6 – upper carrying bar
- 7 – lower carrying bar
- 8 – support
- 9 – tightening bolt
- 10 – stud bolt connection



## Description of apparatus

thermoline® plate heat exchangers consist of a number of corrugated plates. The plate pack is mounted between a fixed and a movable pressure plate, positioned by an upper and a lower carrying bar, and compressed by several tightening bolts.

Gasketed plates and laser welded modules with various patterns are available for a wide range of applications.

The media can pass the heat exchanger either in cocurrent or countercurrent flow. Depending on the operating conditions, medium and temperature-resistant gaskets of the glued-on or clip-on version are used.

The laser welded module forms a hermetically sealed flow channel to the outside. The transition from one module to another is sealed by a ring gasket made of special materials.

## Range of products

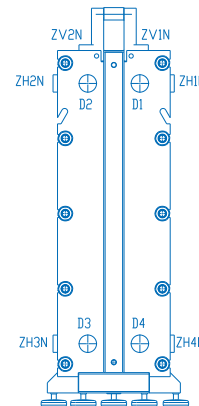
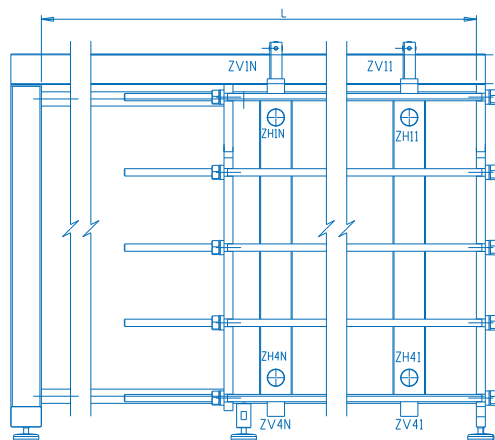
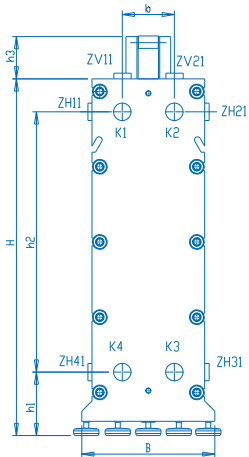
Plates with a variety of patterns, variable depths of stamping and different sizes are available.

### StandardLine plates

- thermodynamically soft pattern
- high flow rate
- low pressure drop
- wide range of applications
- suitable for viscous fluids and sensitive to shearing
- gentle treatment of products
- corrugation depths from 3.5 to 4.0 mm

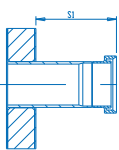
### PowerLine plates

- thermodynamically hard pattern
- high heat transfer coefficients
- high thermal efficiency
- low hold-up volume
- suitable for homogeneous and low viscous fluids
- corrugation depths from 2.0 to 2.5 mm

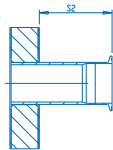


## Connections

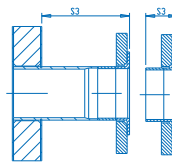
Special connections on request. Inlet / outlet connections at movable pressure plate.



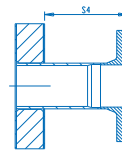
threaded coupling  
DIN 11851



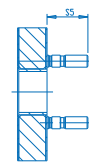
clamp ferrule  
DIN 32676



lapped flange  
(plain collar)  
DIN 2641 (PN 6)  
DIN 2642 (PN 10)  
DIN 2655 (PN 25)  
DIN 2656 (PN 40)



welding neck  
flange  
DIN 2631 (PN 6)  
DIN 2632 (PN 10)  
DIN 2633 (PN 16)  
DIN 2634 (PN 25)



stud bolts  
with lining

## Materials

**frame:** carbon steel painted, stainless steel - massive or clad

**connections:** stainless steel, carbon steel, Titanium, Hastelloy®, PTFE, elastomers

**plates:** 1.4301, 1.4404, 1.4529, 1.4539, 1.4547, Hastelloy®, Titanium

**gaskets:** NBR, EPDM, Chloroprene, Butyl, Viton, PTFE-encapsulated, elastomers

**Other materials on request.**

## Operating parameters

**design temperature:** -40° C to 170° C

**design pressure:** vacuum / 25 bar (g)

**connections:** DN 25 to DN 250

## Tests / Standards

thermoline® plate heat exchangers can be supplied in accordance with both local and foreign regulations.