Tough conditions demand extreme durability

Semi-welded plate heat exchangers for refrigeration applications

The Alfa Laval range

For heavy duty operations
Alfa Laval offers a comprehensive range of semi-welded plate heat exchangers for most types of refrigerants and fluids. These plate heat exchangers combine the flexibility and serviceability of the gasketed units with the assurance against leakage of the welded units.

On the welded side they are particularly suitable for ammonia, with flexible modular design that can handle fatigue stresses and ice formation.

The units – depending on size – can handle temperature ranges from -45°C to 150°C and pressure ranges up to 55 bar. Plates can be made of stainless steel (according to standard AISI 254, 304, 316). Titanium and plate thickness varies between 0.5-1.0 mm to fit most fluids with best performance.

Key features

- High COP factor achievable – due to thin heat transfer material and optimised plate geometry
- Continuous turbulent flow – due to plate geometry that is optimised for 1- and 2-phase duties
- Low filling of refrigerant fulfills critical charge demands
- Low environmental impact – made of recyclable materials
- Low weight and space – thanks to compact construction
- Pressure and temperature fatigue resistant, no damage caused by freezing – due to the design of Alfa Laval gaskets
- Optimised plate geometry – for compact size and cost efficiency
- Options available: insulation, drip tray, protection sheet and U-Turn separator

Applications
Semi-welded plate heat exchangers from Alfa Laval can be used for the following applications:

- Condensers, for applications up to 55 bar
- Flooded evaporators
- DX evaporators
- Cascade systems (including CO_2)
- Desuperheater/gas coolers (for e.g. heat recovery)
- Economizers/subcoolers
- Oil coolers

Technical Data															
Plate type	M6MW		M10BW				MK15BW			T20BW		T20MW		MA30W	
	Frame type:		Frame type:				Frame type:			Frame type:		Frame type:		Frame type:	
Design pressure															
16 bar	FGR		REF	FDR			FGR			FG		FG		FG	
25 bar		FDR													FD
30 bar			REF	FDR				FDR			FS		FS		
40 bar					FT				FT						
55 bar						FX									
Height, H (mm)	920		1110	981			1486			2202*, 2183**		2202*, 2183**, 2333***		2940, 3140***	
Width, W (mm)	320		470				650			780		780		1170	
Min standard length, L (mm)	555	565	555	810	765	1003	1200	1215	925	1235	1290	1235	1290	1620	1625
Max standard length, L (mm)	1605	1615	2355	2410	2365	3353	3000	3015	3325	4535	4590	4535	4590	5820	5225
Vertical connections distance, VC (mm)	640		719				1044			1478		1478		1811	
Horizontal connections distance, HC (mm)	320		225	231			298			363		363		561	
Connection size (mm)	OD62	OD62	DN100	DN100	DN100	DN100	DN150	DN150	DN150	DN200	DN200	DN200	DN200	DN300	DN300

Note:All data in the table are according to PED. Data according to other standards like ASME or ALS is available on request.
* Double flanged carrying bar, ** RHS-profile carrying bar, *** Reinforced carrying bar, >LC=3600 mm

Alfa Laval RefTight™ – unique system for the longest gasket lifetime

Design principle of the gasket system
In order to reach maximum smoothness for best sealing, Alfa Laval has developed a unique gasket system design specifically for plate heat exchangers used in refrigeration applications. The Alfa Laval RefTight™ system is available for M10-BW, MK15-BW and T20-BW models.

The heart of the design lies in having the weld positioned separately outside the ring gasket groove. The separate ring-form gasket groove ensures equal sealing force over the whole gasket.

The efficient O-ring shape makes it possible to use compact plate technology in applications with higher pressure and temperatures. Due to this special design it is also possible to use different materials for ring and field gaskets. This ensures that gaskets are a perfect fit for both media used, securing the perfect solution over the complete temperature span – from -45°C to 150°C.

Therefore, gasket lifetime is longer with this solution than any other available on the market.

Service intervals can also be extended, resulting in cost savings for the end-user. The possibility to choose the most suitable gasket material also secures a lower permeation, which is important for applications in sensitive facilities such as hospitals, supermarkets and other public buildings.

Key benefits:

- Gasket material dependent on fluid, refrigerant and oil. Gaskets are always separated
- Ring gasket symmetric for even gasket forces
- Even thickness over the ring gasket to avoid material stress
- Glue-free gaskets to achieve even forces and for easy replacement
- For best sealing, the gasket groove should not be welded but smooth and clean
- Groove to be supported evenly around the ring to perform in high pressure applications
- Long gasket lifetime gives longer service intervals

Selection of proper gasket material
Gaskets are made from highly resistant materials, attached for easy replacement by a glue-free construction. Using the unique Alfa Laval RefTight™ refrigeration gasket system it is possible to use two different materials for ring and field gaskets ensuring a perfect fit for the fluid type.

The graphs are gasket selection guides based on temperature and pressure data, shown separately for the welded and gasketed side. The first graph helps to find the proper ring gasket material for the welded side usually used with the mix of ammonia (NH_3) and compressor oil. The second graph helps to find the proper field gasket for the gasketed side usually used with water-like media.

Data shown are only informative, for an accurate selection please contact Alfa Laval.

Note:
Gasketed side, field gaskets (water-like media)
- EPDM
- CR (M10-BW and MK15-BW NH_3 for chilling/freezing in cascade)
- NBR
- NBRL T

Note:
Welded side, ring gaskets (NH_3 and Oil)
- FEPM AL (MK15-BW up to 40 bar, M10-BW up to 55 bar)
- HNBR (all units up to 25 bar, MK15-BW up to 40 bar, M10-BW up to 40 bar)
- CR (all units up to 25 bar, MK15-BW up to 40 bar, M10-BW up to 55 bar)
- NBRL T (all units up to 25 bar, MK15-BW up to 40 bar, M10-BW up to 40 bar)
- Saturation curve for ammonia

Alfa Laval in brief

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

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