

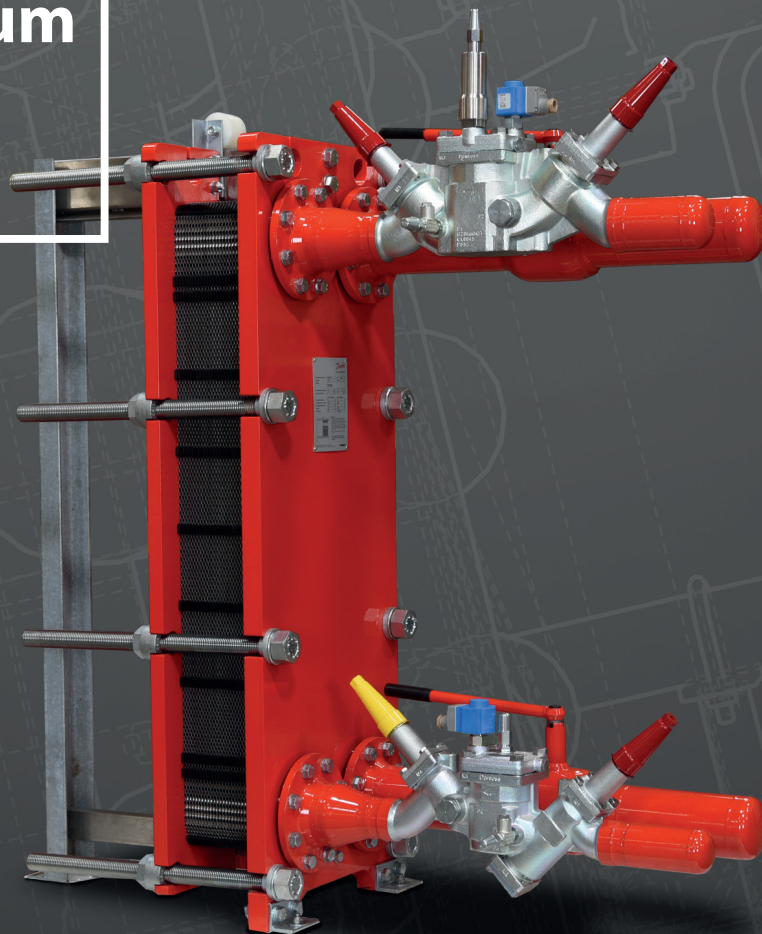
Danfoss Cooling | Semi-welded plate heat exchangers

## More than a heat exchanger

At Danfoss, we are extending our wide portfolio for industrial refrigeration to include plate heat exchangers. The new series of semi-welded plate heat exchangers is optimized for industrial applications and include extensive improvements.

With Danfoss, you get much more than just a high-quality heat exchanger. You also get all the benefits from partnering with a world-leading supplier in industrial refrigeration. All to help professionals achieve and maintain a safer and more energy efficient operation.

**Helium**  
leak tested



# Meet **application needs** with **maximum performance**

The semi-welded plate heat exchangers from Danfoss are designed for ammonia systems and can be used for the following applications:

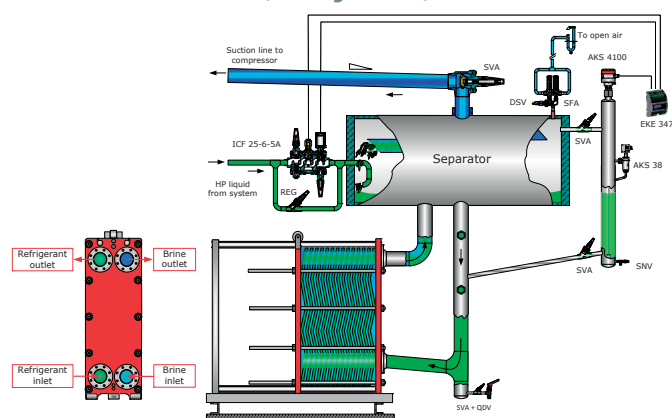
- **Condensers**
- **Flooded and pumped evaporators**
- **Sub-coolers**
- **Desuperheaters**
- **Oil coolers**

The product range includes several sizes SW19-SW59, with more to come, and can handle temperatures ranging from -40°C up to 120°C (-40°F up to 248°F) and pressure ranges up to 25 bar (300 psi). Plate materials include stainless steel AISI 304, AISI 316, and Titanium and come in various plate thicknesses (0.5 - 0.7 mm) to match specific duty and design requirements.

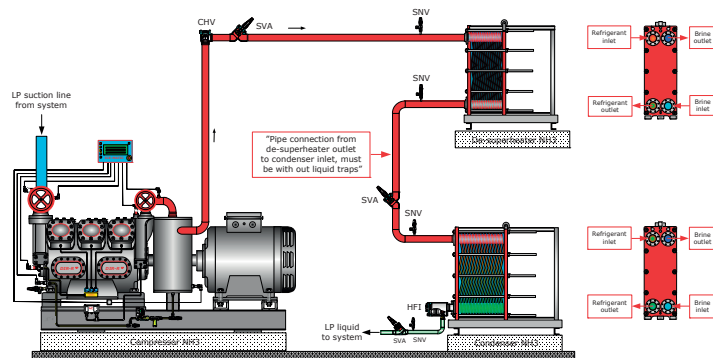
Leveraging the wider portfolio of Danfoss valves and controls and our long-standing refrigeration knowledge, you can turn to Danfoss to help optimize your semi-welded plate heat exchanger configuration and valve selection to best match your specific application and overall system design requirements. A solid layout and correct material selection are key to optimize safety and performance. Experienced application experts and engineers can support and challenge your process for optimized solutions. In addition, our advanced product configuration and selection tools provide guidance and recommendation on best product fit, par example recommending valve sizing, pipe dimensions, and pipe velocities.

In addition to the the semi-welded plate heat exchangers Danfoss offers a wide range of products for these applications such as: ICF valve stations, ICV control and regulating valves, manual valves (SVL), HFI float valve, liquid level sensor (AKS4100) and gas detectors.

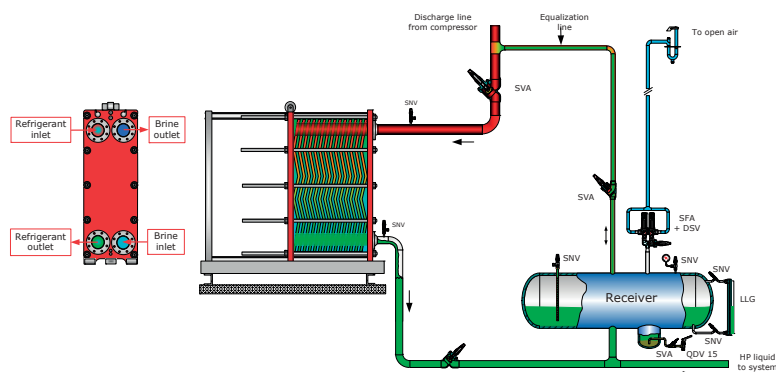
**Flooded Evaporator  
(Cooling of brine)**



**Liquid cooled Condensers  
(Heating of brine)**



**Liquid cooled Desuperheater  
(Heating of brine)**





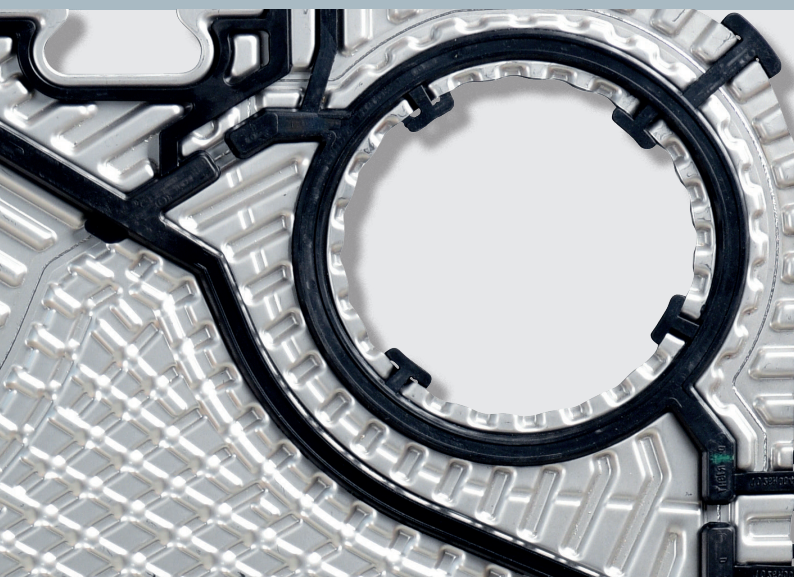
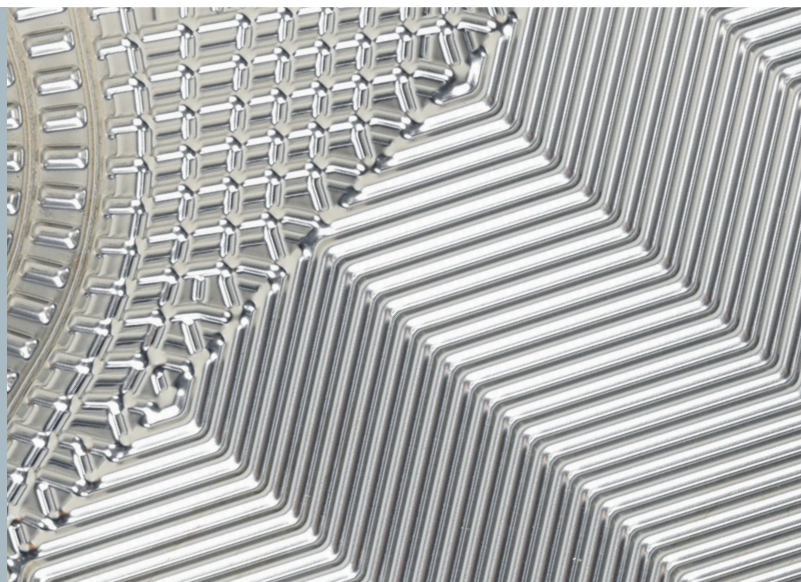
# Semi-welded. **Full efficiency.**

The new range of semi-welded plate heat exchangers has been carefully designed and upgraded to ensure optimal performance, maximum safety and easy maintenance, including a new and highly efficient plate design, a reinforced and double-barrier gasket system, and an improved frame design.

The new range of semi-welded plate heat exchangers comes with several upgrades that not only add more value to your application but also to your business.

## **New plate design** delivers excellent heat transfer capabilities

- Improves plate strength and stability thanks to the optimized plate geometry across the entire plate
- Improves thermal performance due to optimized plate geometry supporting high turbulent flow
- Repositioned welding track for improved quality



## **New gasket system** improves plate pack stability

- Ensures high gasket stability and optimal plate alignment due to new gasket and gasket groove design
- Improves sealing effect and prevents gasket-blow out
- Reduces the risk of contamination due to the double gasket barrier that will drain potential leakages outside the plate pack
- Glue free gasket system for easy maintenance

## **Solid frame design** eases service and maintenance

- Improves accessibility to the plate pack with the non-corrosive nylon roller that makes it easy to slide the follower along the carrying bar
- Makes the assembly of the heat exchanger fast and safe thanks to fixed bolt heads and lock bushes which prevent the nut and bolt head from rotating when opening and closing the unit



# You get **much more** than a **heat exchanger**

**Our new range of semi-welded plate heat exchangers is supported by extensive application knowledge. Because finding the right plate heat exchanger to match your application needs requires a lot of expertise.**

At Danfoss, we offer you comprehensive knowledge on industrial refrigeration which, in combination with our high product quality and diversified product range, offers you the optimum conditions to find the best possible solution to match your needs.

And that is why, we are proud to say that you get more than just a plate heat exchanger when working with Danfoss – you get all the benefits from partnering with a world-leading supplier in industrial refrigeration



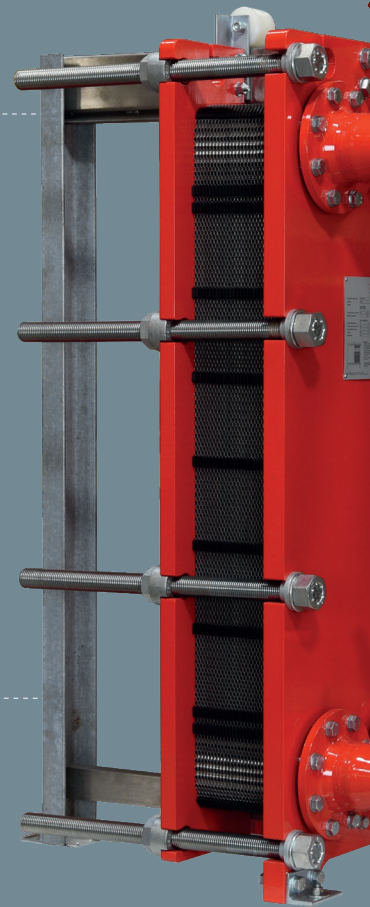
## **Application knowledge**

- Turn to Danfoss for application knowledge and product insights for best-fit solution to match your specific application and overall system design requirements
- Optimize safety during design phase by solid layout and correct material selections
- Solutions designed for long-life and sound service and maintenance plan

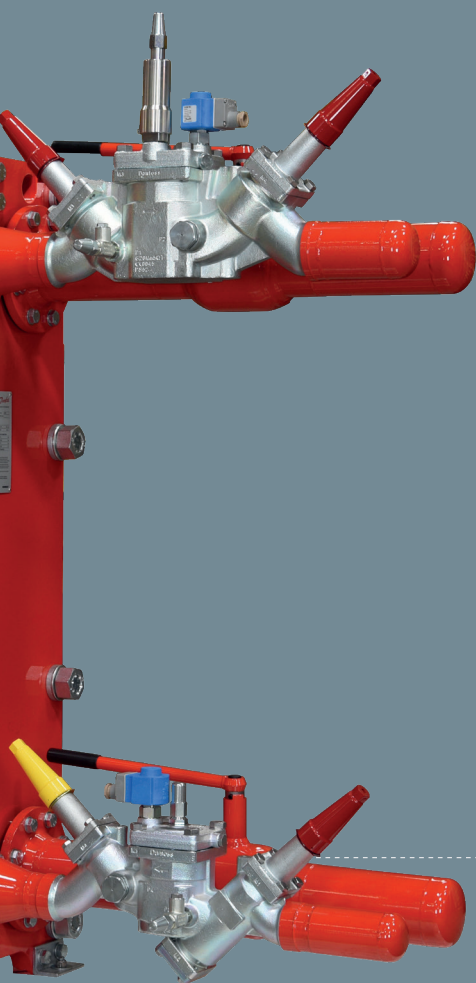


## **Diversified product range**

- Streamline supplier management by combining high quality valves, controls and heat exchangers from Danfoss
- Increase application efficiency with high quality products and proven designs







#### Excellent heat transfer capabilities

- High heat transfer coefficient and efficient flow distribution due to optimized plate design/geometry
- High shear-stress capabilities to help prevent fouling and ensure good cleanability of your plate heat exchanger
- Thermal performance proven and verified on a full-scale, one-stage industrial refrigeration system



#### Reliable design - operational safety

- Re-enforced gasket system provides improved sealing effect and prevents gasket blow-out
- Reduced risk of contamination due to double gasket barrier draining potential leak outside of the plate pack
- Proven and verified design through mechanical and life-time testing



#### Product configuration

- Explore and configure solutions with the Danfoss HexAct product selection software
- Optimize your solution with support from our application and product experts

# Technical data

## Semi-welded plate heat exchangers SW19 – SW59 Range

Product data	Metric	Imperial
Refrigerants	Ammonia (R717)	
Min./Max. working pressure	16/25 barg	150/300 psig
Min./Max. temperature	-40°C/120°C	-40°F/248°F
Frame material	Painted carbon steel (Red, RAL3020)	
Connection size	DN65 (2½") up to DN200 (8")	
Connection classification	EN1092-1-PN16/25	ANSI B16.5 – Class 150/300
Capacity range	From 0,1 to 1,2 MW	From 34,121 to 4,094,570 Btu/H
Gasket system	Glue-free gasket system	
Connections material	Stainless steel and Titanium	
Plate material	AISI 304, AISI 316 and Titanium	
Plate thickness	0,5 mm Stainless Steel for 16 barg (150 psig) 0,6 and 0,7 mm Stainless steel and Titanium for 25 barg (300 psig)	
Field gasket	Various grades of NBR HT and EPDM HT	
Ring gasket	Various grades of NBR, EPDM, and Chloroprene	
Design code	CE (PED), EN13445	ASME VIII, Sec. 1

Size	SW19B	SW26A	SW40A	SW54	SW59
Port, mm (in)	65 (2.5)	100 (4)	100 (4)	150 (6)	200 (8)
Height, mm (in)	820 (32)	800 (31)	1208 (48)	1242 (49)	1208 (48)
Width, mm (in)	304 (12)	378 (15)	378 (15)	502 (20)	664 (26)

## Danfoss **genuine spare parts** for **reliable operation**

**The availability of reliable spare parts is essential for heat exchanger solutions handling critical processes and utility applications. By using original spare parts, you minimize the risk of unscheduled stoppages due to premature failure of non-original components and parts.**

Critical spare parts to service the Danfoss portfolio of semi-welded plate heat exchangers are always at hand when you need them. They include:

- Spare ring and flow gaskets to service or adjust your plate heat exchanger to maintain its performance
- Spare plate cassettes should you need to exchange cassettes or adjust the number of cassettes for your plate heat exchanger to meet extended or new application requirements.

### Accessories:

A range of accessories is available to further complement the safe and efficient operation and functionalities of the Danfoss semi-welded plate heat exchangers.

### Insulation jacket:

To prevent outside temperature impact, mounting an insulation jacket around plate heat exchanger can prevent energy loss and increase the efficiency considerably.

The Insulation jacket is made from PU foam encased by aluminium plate. Snap locks fittings make assembly and disassembly simple and ensure easy maintenance access.

A wide range of prefabricated standard sizes are available which are customized to fit the actual size of the plate heat exchanger. There is no bottom cover in the design of the insulation jackets. Custom-made solutions are available upon request.

### Drip tray:

Drip trays are used to collect condensed water during defrost or stand-still situations and prevent liquid to flow to the floor. They are available as insulated or drainable versions and made from either stainless or galvanized steel. Standard sizes are fitted to the actual size of the plate heat exchanger. .

### Spray screen:

For additional operational safety spray screens may be mounted on the plate heat exchanger to improve the protection of personnel and surroundings in the event of a leakage. Spray screens are available in stainless steel AISI 304 and are customized to fit the size of the actual plate heat exchanger.

### In-line filter:

In-line filter is used to prevent foreign objects and particles from entering and clogging the plate heat exchanger (e.g. from seawater, sea wheat, sea shells, etc.). It is used to filter the brine and help to prevent particles disrupting the performance of your system. The in-line filter is made from stainless steel (AISI 304).

### Ratchet spanner:

To ease the opening and closing of the plate heat exchanger Danfoss offers ratchet spanners which are designed to fit the nut size of the plate heat exchangers.



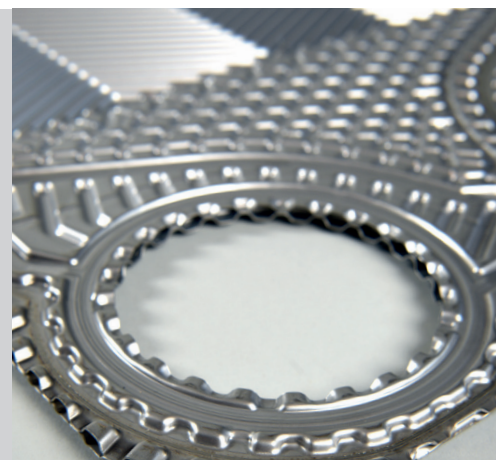
# Semi-welded. **Fully tested.**

All semi-welded plate heat exchangers are fully tested before they leave the Danfoss factory. Because, as dedicated engineers, we are not satisfied until we offer you products that match application needs and meet your highest expectations.

## **Thermal performance testing**

The Danfoss semi-welded plate heat exchangers have a solid and reliable design which has been documented through thermal performance testing and mechanical and life-time tests.

- The thermal performance of the complete semi-welded plate range has been proven and verified on a full-scale, one-stage industrial refrigeration system
- The thermal performance tests have been performed across the entire semi-welded portfolio (i.e. plate sizes and plate patterns), for various plate-pack sizes at various capacities



## **Mechanical testing**

The entire Danfoss semi-welded portfolio including plate and frame designs across various plate and gasket materials has been mechanically tested to document its solid design and durability. The mechanical tests include:

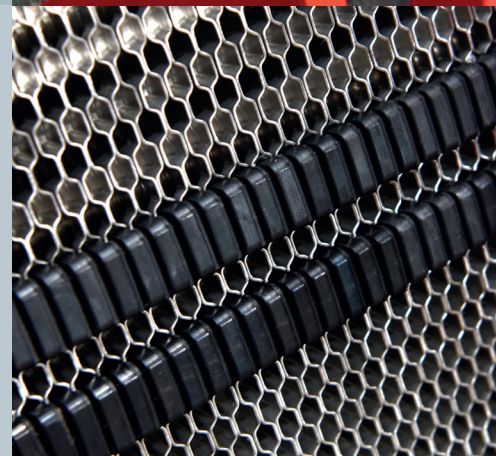
- Strength test according to PED and ASME requirements to document pressure ratings
- 48 hours vacuum test to document strength and heat exchanger sealing capability
- Fatigue test running 35.000 pressure-change cycles (from 5-25 bar) to test life-time durability



## **Cassette testing**

To ensure high and consistent product quality every semi-welded plate heat exchanger is helium leak tested to document correct gasket sealing and tightness.

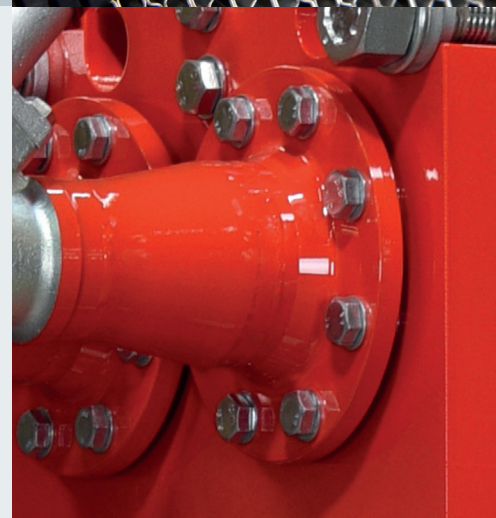
- Following laser welding, each plate cassette is helium (He) leak tested
- The helium leak testing is a calibrated system meeting Danfoss QA and performance procedures
- This ensures a high level of product quality and helps minimize potential product failure later in the in assembly process



## **Final product testing**

Once assembled, we perform several final product tests to ensure that the semi-welded plate heat exchanger live up to our high Danfoss standards.

- Hydraulic strength test is performed according to specified design codes (PED or ASME). Once completed, the semi-welded plate heat exchanger is dehydrated under vacuum and ready for helium leak test
- Internal Helium (He) leak test is performed across the ring gasket and the diagonal gasket
- External Helium (He) leak test is performed as an accumulated leak test to test the gasket sealing capability to the outside



# A **partnership** based on extensive **application knowledge**

Working with Danfoss means more. It means that you do not only get highly reliable, efficient, and innovative solutions – you also get to partner with a world-leading supplier in industrial refrigeration.

Our partnership gives you access to a wide range of benefits. From extensive application knowledge to a wide range of solutions and tools. With the new range of semi-welded plate heat exchangers, we expand our portfolio of valves, controls and sensors to strengthen our offerings for industrial refrigeration solutions.

## Do you want to discover more?

Visit [PHE.danfoss.com](http://PHE.danfoss.com) to find information on availability, features, and benefits of our new series of plate heat exchangers.

## Support Tools for Professionals



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