

ENGINEERING TOMORROW

Danfoss Climate Solutions Brazed Plate Heat Exchangers

## Ultra-efficient brazed heat exchangers for a wide range of applications

Featuring the revolutionary Micro Plate™ technology – innovation transferred





# Adaptable to you

At Danfoss we believe in driving innovation to create heating solutions that meet your needs more closely and with greater flexibility. Today, by reengineering the core technology that makes a real difference to performance, our new range of brazed heat exchangers delivers unmatched heat transfer and energy efficiency.

#### 21st century performance

Even though significant improvements have been made across the heat transfer technology, traditional brazed heat exchanger plate design has remained the same for over 40 years. At Danfoss we recognise that times have changed and your needs have grown alongside the demands of your systems and the people they serve.



In order to provide you with better and more flexible heat exchanger solutions, we've developed an entirely new approach to plate design. Our brazed heat exchangers with new stateof-the art Micro Plate<sup>™</sup> technology feature next generation efficiency and performance – giving you more from your liquid-to-liquid applications.

## The Micro Plate<sup>™</sup> revolution

Using our Micro Plate<sup>™</sup> technology, Danfoss heat exchangers outperform other solutions on the market with better **thermal and hydraulical performance.** 

The unique plate design means your application can even be individually recalibrated to match your specifications – so you choose what's best for your system



## **Designed for HVAC & Refrigeration**

Danfoss is known worldwide as an innovation leader within the heating industry, with unrivaled expertise in HVAC.

We have applied this knowledge to our new brazed heat exchangers with a complete range of types suitable for virtually every liquid-to-liquid application and network. Whether your system has varying or constant pressure and large temperature swings, we have the perfect solution for you.



## A world of applications

## Enabling efficient heating and cooling systems

Wherever heat is exchanged from one liquid medium to another, Micro Plate<sup>™</sup> brazed heat exchangers can dramatically improve system efficiency. Below are four examples of systems, which can be significantly improved by their use:

## 1. Chiller applications – Single and Dual Circuits (specific models)

Chiller applications include AC Chillers & Refrigeration Chillers for Industrial Process, HVAC Comfort Cooling/Heating, Commercial Chillers and Residential Heat Pumps.

#### 2. District heating and cooling – Double Wall Available (specific models)

In district heating and cooling systems, Micro Plate<sup>™</sup> heat exchangers are used in the hydraulic interface between the distribution network (primary side) and the building application (secondary side) in residential buildings of any size.



**3. Decentralized DHW preparation** In multifamily buildings, Micro Plate<sup>™</sup> heat exchangers are optimal for use in decentralized systems where each flat has its own hydraulic module, also known as flat stations.



4. DX Evaporators
5. Condensers
6. DX Subcoolers
7. Heat Pumps
8. Liquid to Liquid Cooling/Heating



## 9. Special Applications

- Supermarket Systems
- Ice Making Machines
- Environmental Chambers
- Hydraulic Oil Cooling
- Beverage, Beer & Wine Cooling





## Innovative Danfoss Micro Plate™ technology



Brazed Micro Plate<sup>™</sup> heat exchangers are a revolutionary technology from Danfoss. Characterized by their unique pattern, our innovative new plate design outperforms other solutions on the market with significantly lower pressure loss and vastly improved heat transfer.

- Up to 10% enhanced heat transfer rate
- Increased lifetime

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- Substantial cost and energy savings
- Better selfcleaning
- More flexible and compact design

### Asymmetric design

Micro Plate<sup>™</sup> technology can also offer a great flexibility in designing heat exchangers for applications with highly asymmetric flow-rates on primary and secondary sides.

Utilizing the asymmetric Micro Plate<sup>™</sup> design will allow up to 15% better heat transfer coefficients compared to other chevron style brazed plates.



# High performance and long lifetime

Compared to traditional heat exchangers, Micro Plate<sup>™</sup> technology delivers exceptional performance, efficiency and flexibility.

For the first time, you can now create a system individually suited to your application. By varying the number, size and placement of dimples, Micro Plates can be adapted for optimal heat transfer and minimal pressure drop – so you decide what's best for your needs.

### Micro PlateTM advantages:



#### 10% enhanced heat transfer

New type of plate pattern in microplate technology creates completely new type of channel. Dimple pattern makes nozzle-diffuser channel, which has bigger turbulence and less scaling than traditional chevron channel.

In nozzle velocity of liquid increases, in diffuser it decreases. That leads to local pressure oscillations inside the channel, which helps to thin down boundary level and create bigger turbulence on the surface of heat plate, preventing dirt to stick to HEX plates.





#### Longer lifetime

In microplate brazed points are flat, which increases the brazing area between the heat plates. This ensures all pressure loads are distributed to bigger area, which decreases the stress in the heat plate.

Micro Plate<sup>™</sup> heat exchangers have a broad, flat brazing surface which adds stability to their construction.

### **Better flow distribution**

The improved water flow distribution in microplate leads to even velocity profile of liquid on the plate, decreasing amount of stagnation zones on the plate. Minimising stagnation zones is essential to achieve high efficiency of heat transfer with minimum loss of pressure. Optimised flow distribution areas allow microplate Heat exchangers to effectivly use areas around porthole for heat transfer, which is increasing efficient Heat transfer area of each plate. So heat transfer area is almost equal to physical area of the heat plate.





# **BPHE broad portfolio**

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Platform	B3-012	B3-014	B3-018	B3-020	B3-027	B3-030	B3-052
Outline, inch	2.8 x 7.3 [in]	3 x 8.1 [in]	3.5 x 9.1 [in]	2.8 x 12.4 [in]	4.4 x 12.3 [in]	3.7 x 12.8 [in]	4.4 x 20.7 [in]
Outline, mm	72 x 186 [mm]	77 x 207 [mm]	90 x 231[mm]	72 x 314 [mm]	111 x 311 [mm]	95 x 325 [mm]	111 x 527 [mm]
Capacity, kW	0 - 5 kW	0-7 kW	2 - 10 kW	2 - 10 kW	2 - 16 kW	2 - 30 kW	10 - 70 kW
Capacity, RT	0 - 1.5 RT	0 - 2 RT	0.5 - 3 RT	0.5 - 2.8 RT	0.5 - 4.5 RT	0.6 - 8.5 RT	3 - 20 RT
Design pressure, psi	145 or 435 psi	435 or 653 psi	435 or 653 psi	435 or 580 psi	435 or 653 psi	435 or 653 psi	435 or 653 psi
Design pressure, bar	10 or 30 bar	30 or 45 bar	30 or 45 bar	30 or 40 bar	30 or 45 bar	30 or 45 bar	30 or 45 bar
Max. threaded connection	3/4″	3/4″	3/4″	3/4″	1" & 1/4"	1″	1" & 1/4"



30 bar

3″

30 or 45 bar

3″

20 bar

3″

30 bar

2″

30 or 45 bar

2″

30 or 45 bar

2"

# MPHE chiller & heat pump portfolio

					••	••		••		•
12		17		22	30	34	39	44		55
3 x 6.1 [in]	3.7 >	x 7 [in]	3 x 1	2.3 [in]	3.7 x 12.6 [in]	4.6 x 11.4 [in]	4.6 x 13.1 [in]	4.7 x 14.8 [in]	4.3 x	20.7 [in]
76 x 154 [mm]	94 x 1	79 [mm]	76 x 312 [mm]		95 x 320 [mm]	118 x 289 [mm]	118 x 332 [mm]	119 x 376 [mm]	109 x 5	525 [mm]
0.5 - 6 kW	2 -	15 kW	3 - 30	2 - 20 kW	3 - 20 kW	2 - 20 kW	5 - 50 kW	2 - 15 kW	10 - 65	5 - 40 kW
0.14 - 1.7 RT	0.5 - 4.3	0.8 - 4 RT	0.8 - 8.5	0.8 - 6 RT	1.4 - 8.5 RT	0.5 - 5.7 RT	1.4 - 14.2 RT	0.5 - 4.3 RT	2.8 -	18.5 RT
711 psi	711 psi		435 or 653 psi		435 or 653 psi	508 psi	711 psi	508 psi	435 or 653 psi	
49 bar	49 bar		30 or 45 bar		30 or 45 bar	35 bar	49 bar	35 bar	30 or 45 bar	
Chiller Portfolio	Chiller	Heat Pump	Chiller	Heat Pump	Heat Pump Portfolio	Heat Pump Portfolio	Chiller Portfolio	Heat Pump Portfolio	Chiller	Heat Pump



	62 117		118		129	212	262	
4.6 x 20.7 [in] 9.7 x		9.7 x 19.1 [in]	7.3 x 24.1 [in]		9.7 x 20.7 [in]	11.7 x 27.8 [in]	14.1 x 29.3 [in]	
118 x 525 [mm] 246		246 x 486 [mm]	186 x 613 [mm]		246 x 525 [mm]	296 x 706 [mm]	358 x 744 [mm]	
30 - 90	5 - 50 kW	50 - 250 kW	70 - 250	30 - 130 kW	50 - 300 kW	200 - 450 kW	300 - 800 kW	
8.5 -	25.6 RT	14 - 70 RT	20 - 70	20 - 57 RT	14 - 85 RT	55 - 130 RT	85 - 225 RT	
435 or 6	553/711 psi	435 or 653 psi	435 or 6	53/711 psi	711 psi	435 or 711 psi	711 psi	
30 or 45/49 bar		30 or 45 bar	30 or 45/49 bar		49 bar	30 or 49 bar	49 bar	
Chiller	Heat Pump	Chiller Portfolio	Chiller	Heat Pump	Chiller Portfolio	Chiller Portfolio	Chiller Portfolio	



## **Dedicated to your business**

At Danfoss, we are committed to finding the right heat exchanger solution for your district energy system, whatever your requirements. As a one-stop supplier, you get a dedicated partner who is on-hand 24/7, with offices and trusted service partners close by, worldwide.

#### Supporting your needs

Whether you are providing complete heat transfer systems or involved in the design of low energy applications, partnering with Danfoss is the best way to find the right heat exchanger solution, whatever your requirements.

#### **Engineering tomorrow**

We deliver superior heat exchanger solutions through a combination of best-in-class components, exceptional consultancy services and tailored support. As such we give you the tools and knowledge to deliver the best results for your customers today and to ensure that your business is best placed to meet their needs tomorrow.

#### **Customized plate heat exchangers**

Danfoss is also able to create custommade plate heat exchangers built to your specifications, including:

- Sizes and heat exchanger dimensions
- Heat transfer capacity and number of plates
- Connections: number, types
   and positions
- Packaging method

Contact us for more information about your customisation options.



## Dedicated to you

## A simplified, one-source solution

Keeping suppliers to a minimum means simpler processes and less costs. That's why we've created a comprehensive service solution where you only deal with us. And thanks to our full product range and tailored support programmes, you get all the options and choice you could want.

## A full spectrum of support

Not only do we provide the very best products in their categories, we also offer technical pre-sales support to help you to design the most efficient system for your heating network before you commit to any investment outlay.

Our comprehensive product range complies with international standards and our one-stop service means you receive value through dedicated customer care at every stage.

By integrating our processes into one solution, you get what you need, when you need it, with less time, money and management required.



## **Quality first**

Danfoss products are manufactured to the highest standards. Our facilities have been awarded all necessary certifications, and all our heat exchangers are performance-tested before shipment. Should you be unsatisfied with any purchase, we offer a full warranty service. Our quality management system certifications and compliances



Along with full compliance with EU directives and product approvals.

## Other solutions for your applications

# Gasketed plate heat exchangersStandard heat exchangersSanitary heat exchangersFree Flow heat exchangersWelded heat exchangersSpiral heat exchangersSondBlock heat exchangersFully welded heat exchangersSpiral heat exchangersSondBlock heat exchangersPlate & Shell heat exchangersSemi-welded heat exchangersEvaporator and condenserFresh water distillerFresh water distillers

## Heat transfer solutions that match your requirements.

Next-generation SONDEX® heat exchangers from Danfoss are designed with a single purpose in mind - to create optimal heat transfer.

Developing optimized solutions is a core value of our design philosophy and we have used our deep process knowledge and input from customers to create a second-to-none product portfolio.

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## Find the perfect match with our 5<sup>th</sup> generation selection software

Now the user-friendly selection software, makes it faster and easier than ever to find the right Danfoss heat exchanger for your needs.

Our intelligent software will help you to discover the most appropriate and competitive solution for your applications. A range of new features will allow you to significantly save time on big amount of calculations.

Simply follow the step-by-step guide and the selection software does the rest.

Start saving energy today at: www.hexact.danfoss.com

- Quick and easy to use
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- Revolutionary Multicalc mode (500 HEX selections in 15 minutes)
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