GENERAL CATALOG





The Thermal Solution Company

Using plate type heat exchangers as our core technology, we provide thermal solutions to our customers all over the world.



HISAKA WORKS / Konoike Plant



HISAKAWORKS S.E.A. (Malaysia)



HISAKA WORKS (CHINA) CO., LTD. (China)



UX-160, one of the largest plate heat exchangers in the world

Use it "surely."
Use it "more."
Use it "longer" into the future.
HISAKA continues
to supply reliable
plate heat exchangers.

HISAKA WORKS, LTD. is the largest plate heat exchanger manufacturer in Asia.

By manufacturing and selling plate heat exchangers used in applications such as heating, cooling, sterilization, pasteurization, heat recovery, and condensation in various industrial processes for chemicals, food, air conditioning, marine, pulp and paper, steel / metal and automobile and related. We contribute to the effective use of resources and the improved efficiency of production facilities. We are also actively engaged in overseas expansion. We have established network in Malaysia, Thailand, Singapore, China, South Korea, Indonesia, Vietnam, the Philippines, and Saudi Arabia, and also provide technology to ARSOPI THERMAL (Portugal).



40,000 ton press, one of the largest in the world



Fully-automated 20,000 ton press



High-speed, automated 4,000 ton press

Design Plate Heat Exchangers Online

Since we delivered our first domestically-produced device in 1953, HISAKA plate heat exchangers have been used in all kinds of industries as compact heat exchangers with maximum efficiency. In order to meet more diverse and more sophisticated needs, we have arranged a rich variety of models, from small models of 0.18 m²/unit to large models up to 3,400 m²/unit.

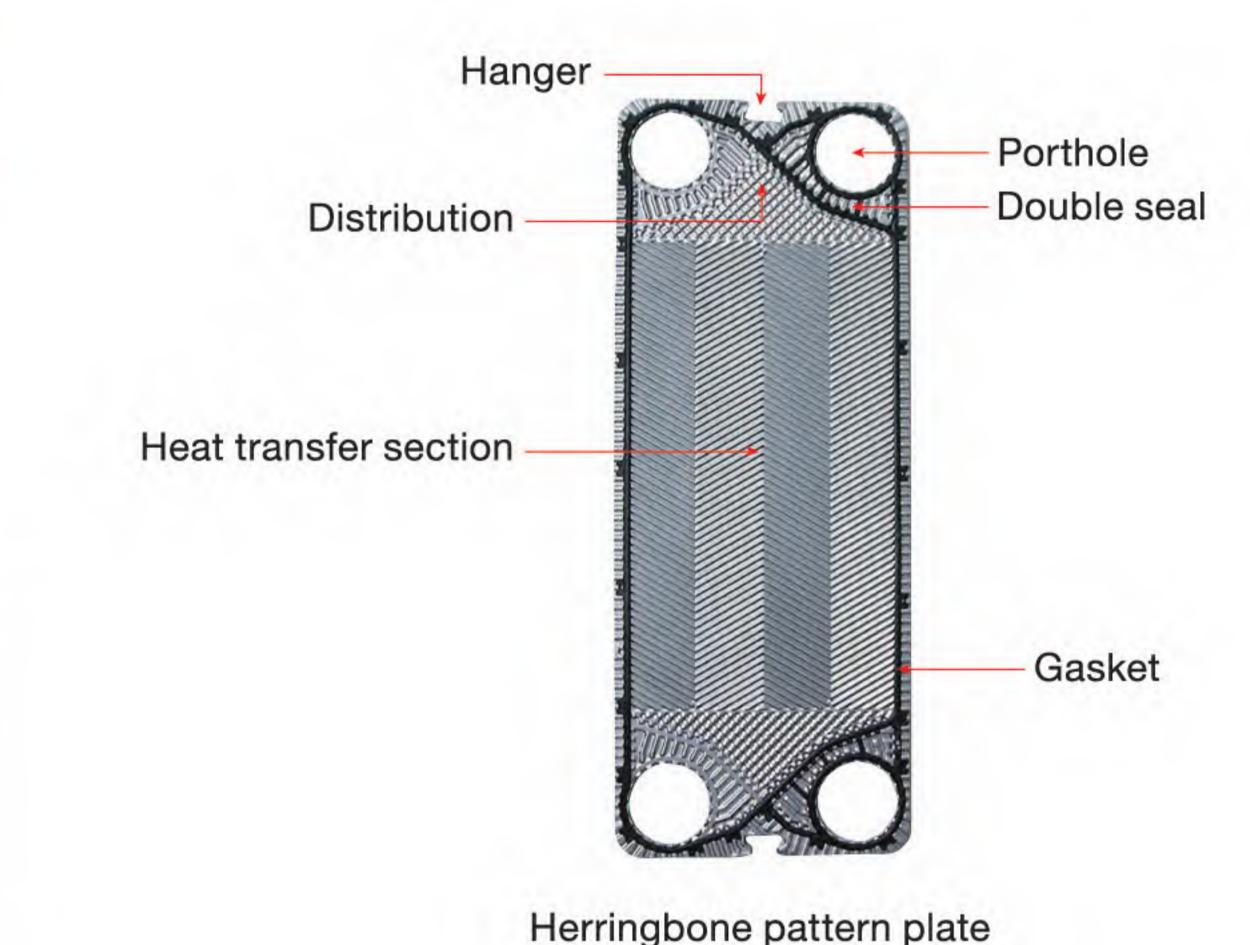
Basic Structure

Heat transfer plates are made by pressing thin sheets of corrosion-resistant metal such as stainless steel or titanium, then set them with seal gaskets and hang and pile them on the guide bar. Then, plates are tightened with bolts between the fixed frame and the movable frame. Here, there is a certain gap between the heat transfer plates that allows liquid to flow. The liquid inlets and outlets are in the fixed frame or the movable frame.

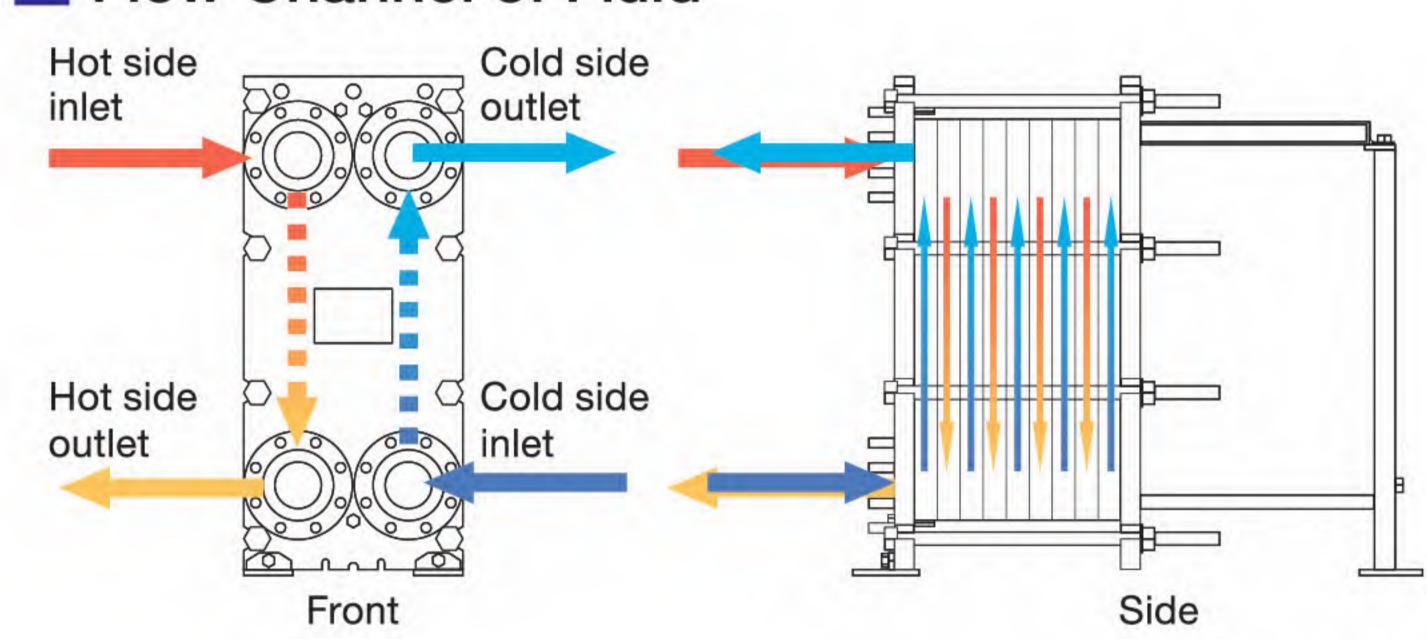


Heat Transfer Plate

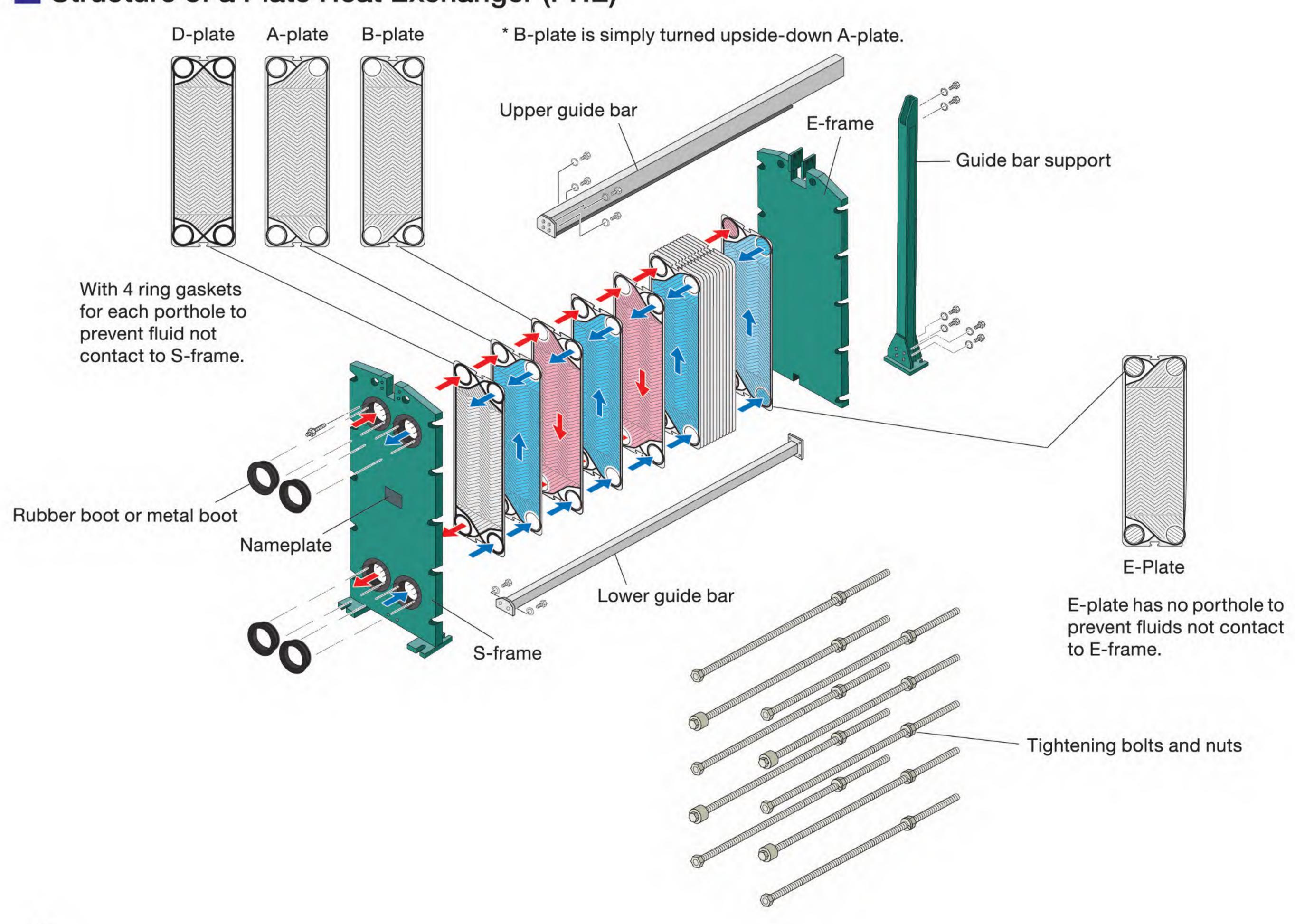
Each heat transfer plate is corrugated to various patterns to increase its strength and surface area. Furthermore, the corrugation makes high turbulence and thereby achieves high heat transfer coefficient. Portholes are formed in the plate's four corners. The gasket is set into the groove around the plate edge to seal in the fluid. (Refer to P7.)



Flow Channel of Fluid



Structure of a Plate Heat Exchanger (PHE)



Standard Operational Data

Processing capacity: 0.1 m³/h to 7,300 m³/h

Working pressure: max. 4.0 MPaG

Working temperature: max. 180°C

Heat transfer area: 0.18 m²/unit to 3,400 m²/unit Plate material:

Stainless steel: 304, 316, 315J1, 317, Etc.

Titanium: TP270, TP270-Pd

High nickel alloy: C-276, C-22, B, G

Nickel: NNCP, NLCP

Other: Domestic and international standard materials

Gasket materials:

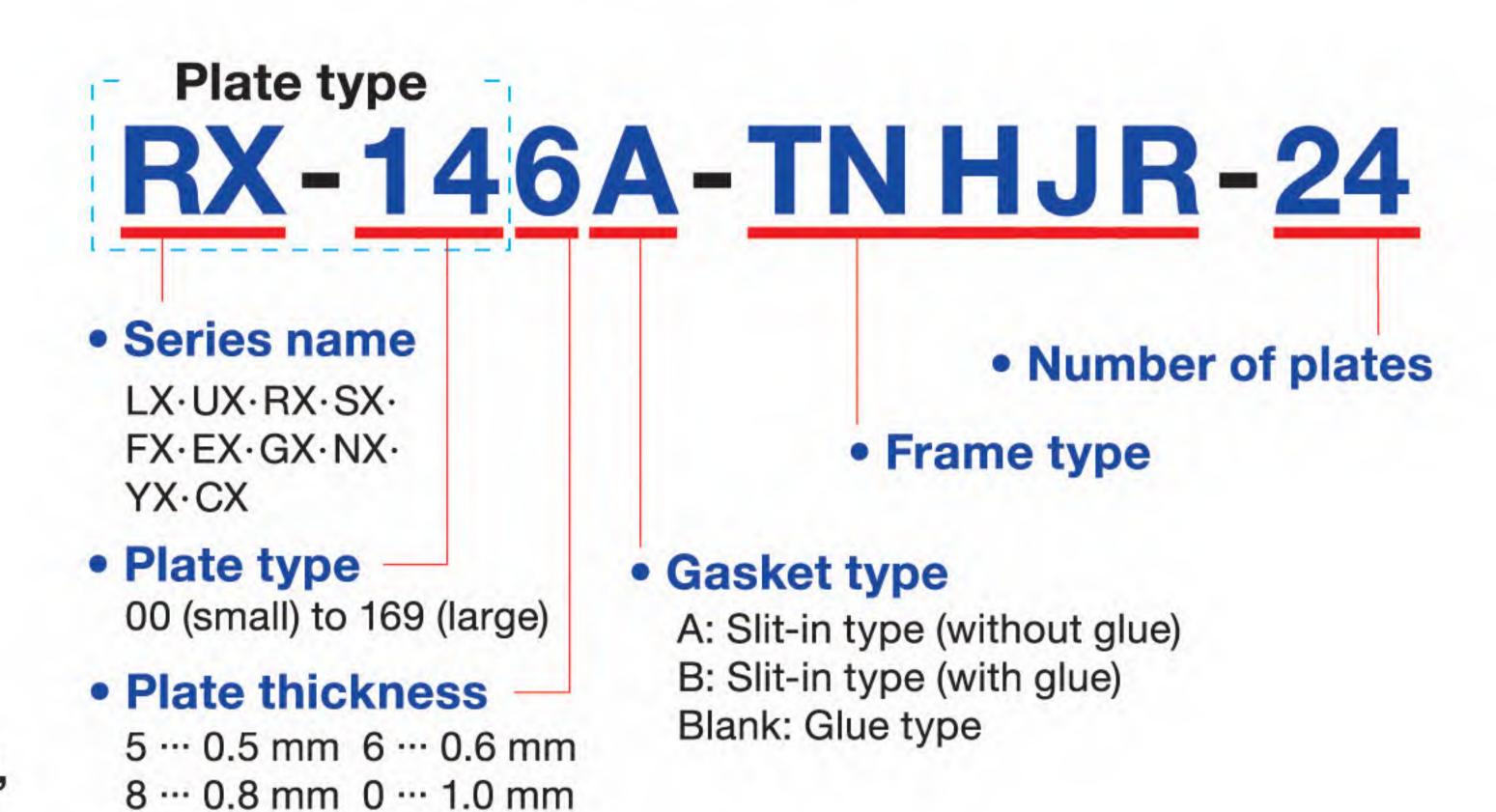
NBR, IIR, EPDM, FPM, Silicon,

TCG (PTFE cushion gasket)

* The above data varies depending on the model, material, plate thickness, and operating specifications.

PHE Model Numbers

The plate type, thickness, and number, and the frame type for HISAKA PHEs are indicated as below.



Pressure Vessel Code and Standard

Our company can design and manufacture plate heat exchangers subject to the following regulations and applications. As certain applications may not be possible depending on the model, material, plate thickness, and other factors, please be sure to inquire with us if regulations may apply.

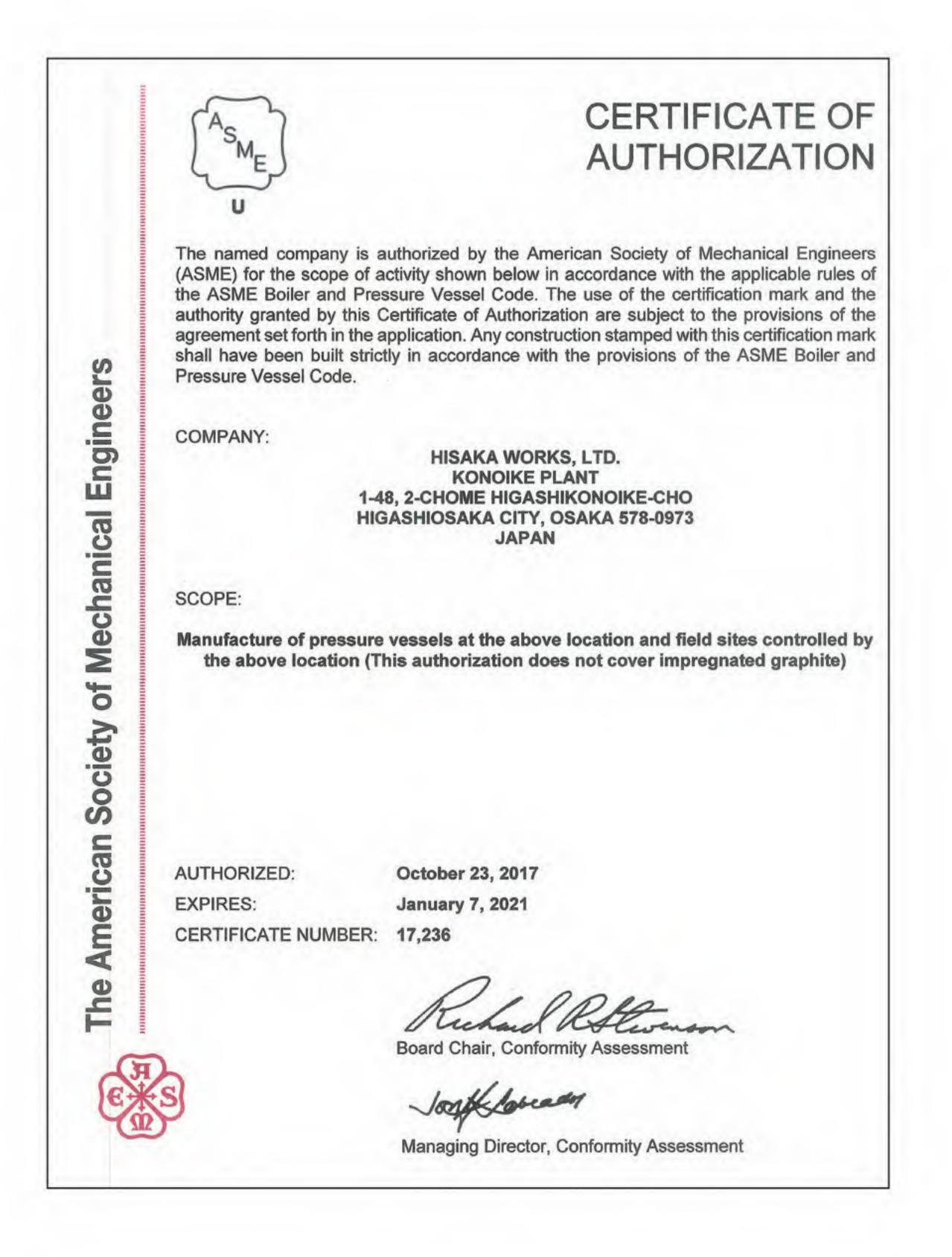
Overseas Standards

ASME W STAMP

We can design and manufacture plate heat exchangers in compliance with ASME (American Society of Mechanical Engineers standard).

ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.

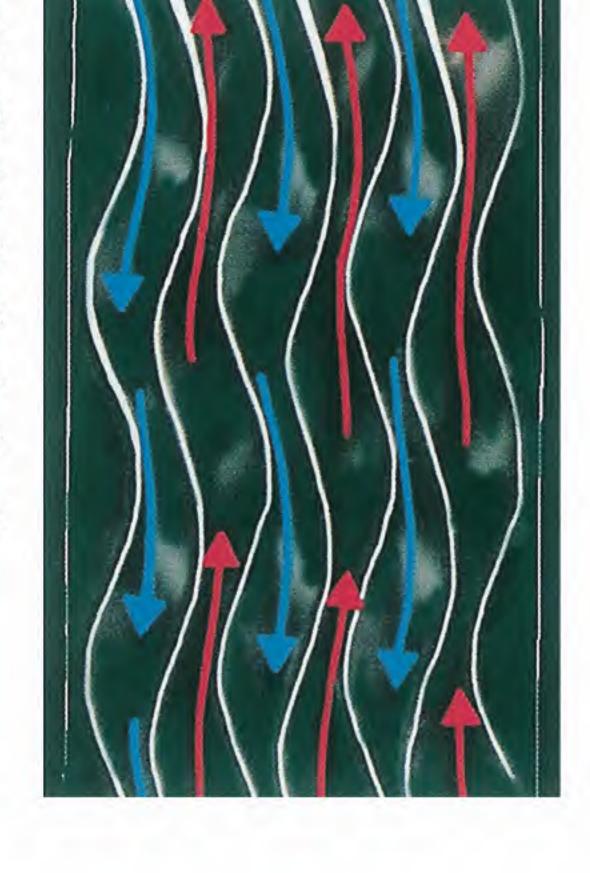
Note: As the design temperature may be subject to restrictions depending on the aforementioned plate material, plate thickness, and gasket materials, please be sure to inquire with us.



Features

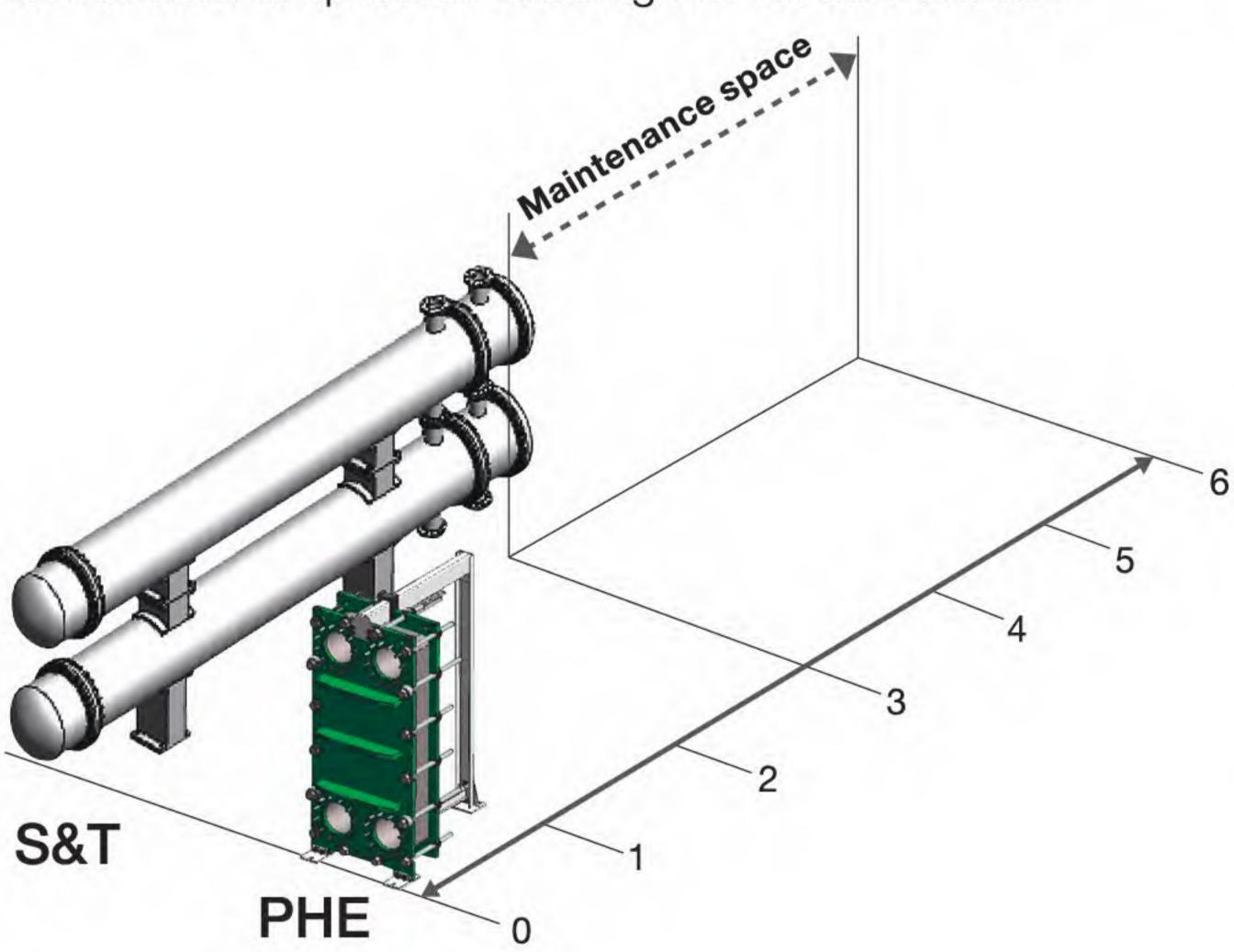
High Performance

The overall heat transfer co-efficient (U-value) ranges from 4,000 to 9,000 W/m² · °C in water application, since the plate corrugation provides a highly turbulent flow. This is one of the reasons why plate heat exchangers have such a high heat transfer coefficient. In addition, this turbulent flow also acts to prevent scales on the plate surface.



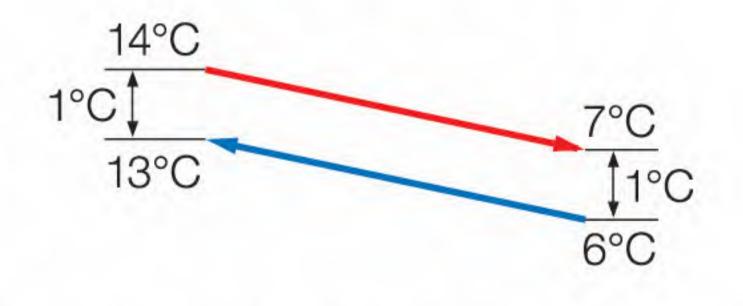
Smaller Footprint

The lightweight and compact construction reduces the installation space to 1/3 and the weight to 1/10 of S&T (shell & tube heat exchangers), respectively. In addition, the lightweight and thin heating plates and less liquid hold facilitate the installation work. The Plate Heat Exchanger can be disassembled for cleaning without piping work, while the S&T heat exchanger needs additional space for drawing out the tube bundle.



The terminal temperatures difference up to the limit.

The construction which permits heat exchanging in a perfect counter-current flow with very efficient heat



transfer makes it possible to approach a temperature difference between the hot and cold fluids of 1°C or less.

Line up

We have a rich variety from small to large plate heat exchanger. You can select the most suitable type for your specification requirements.

Easy Maintenance

Loosening the tightening bolts allows for simple disassembly. The heat transfer plates can be easily inspected visually, and cleaning is easy.

Steam available as the heat source

The use of a synthetic rubber gasket with a special composition enables the use of steam as a heat source, that is, an operating temperature range up to 180°C.

Minimal heat radiation

Heat radiation from plate pack is blocked by the gasket, with only a minimal amount of heat radiation from the thin fin-shaped edge. Also, as the front and rear of plate pack is connected to the frame of each through an air layer, the heat radiation is minimal. Except in cases with an extremely small number of plates, it is less than 1% of the heat exchange amount.

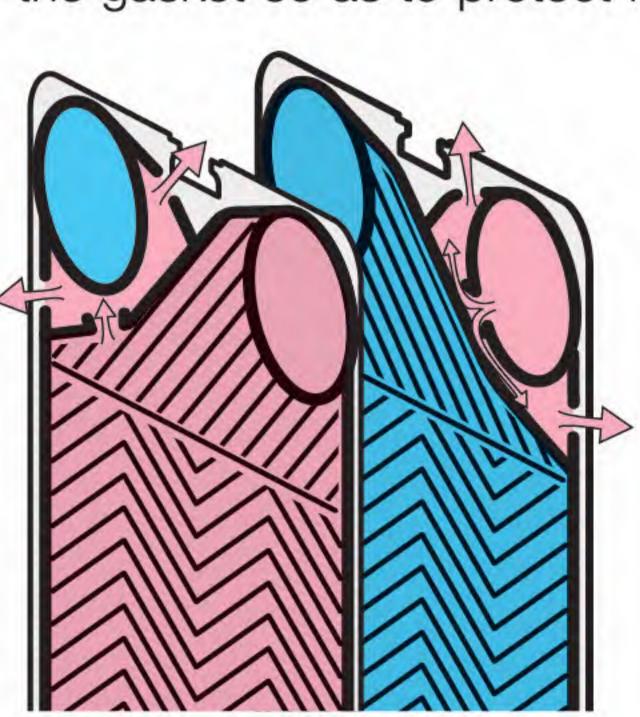
Short delivery time

We have a stock of plates in standard materials (SUS304 / 316 and TP270) and have standardized the construction to achieve short delivery time. However, regarding special materials such as high nickel alloy, NNCP, TP270-Pd, and the like, please inquire.

Prevention of Liquid Inter-mixing

Special consideration is taken for the gasket so as to protect it

from direct contact with the liquid. Furthermore, the gasket is a double-seal type so as to permit liquid draining outside the exchanger even in a case of a liquid leak caused by its deterioration.



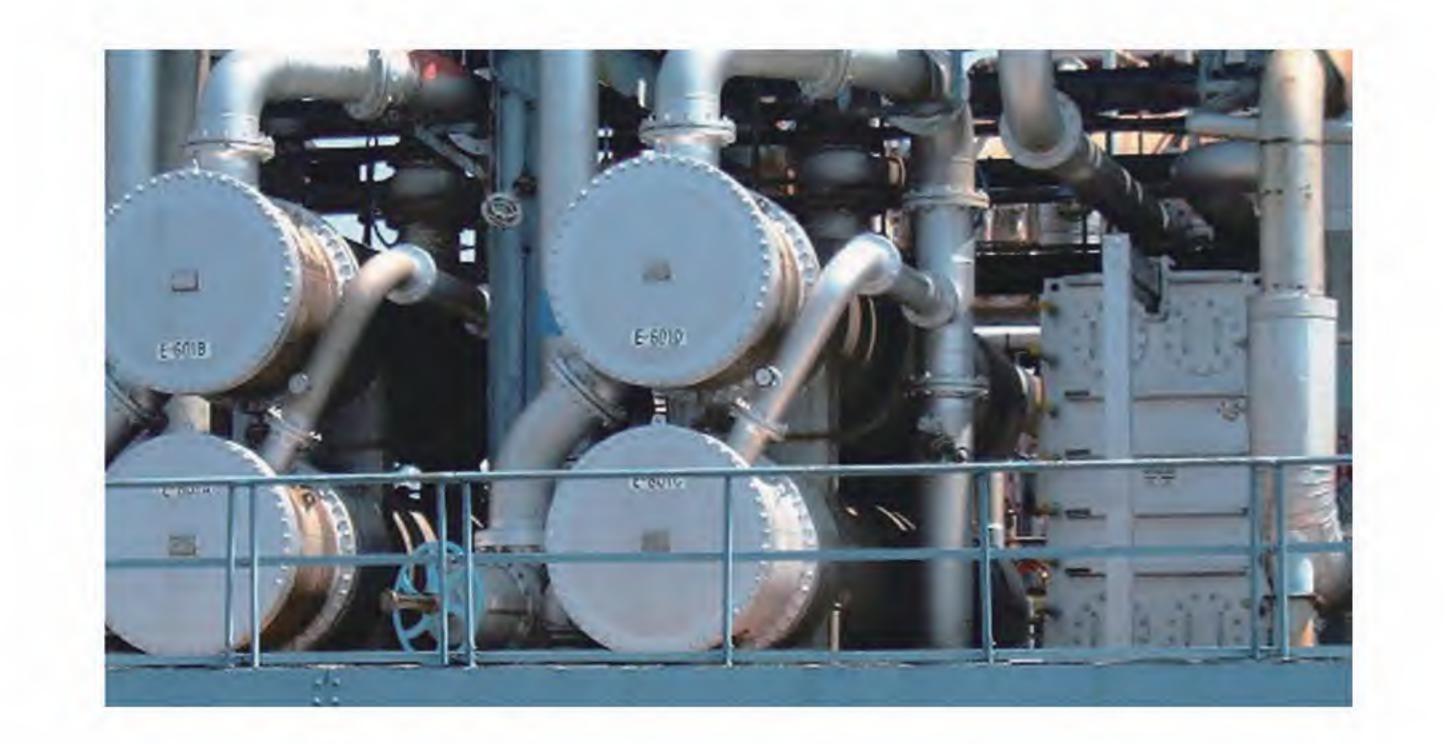


Plate Element Types

The plates are specially selected from various patterns so as to achieve optimum heat transfer area and cost effective heat exchanger type for each requirement. These plates include the corrugated pattern EX and FX series, the herringbone pattern RX, UX, LX, SX, and CX series, and the specific pattern GX and YX series.

Corrugated Pattern

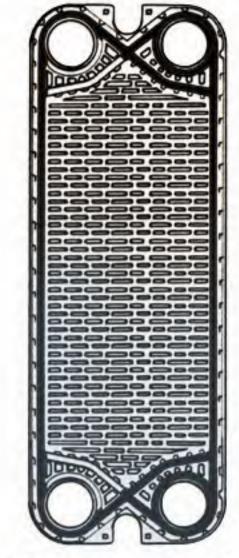
The corrugated pattern is also called the wash board pattern. It has less metal contact points between plates and allows for even liquids with fiber or sludge contents to flow easily without blockage. The FX series was developed exclusively for food application even beyond the conventional corrugated pattern. (Refer to P16)

Herringbone Pattern

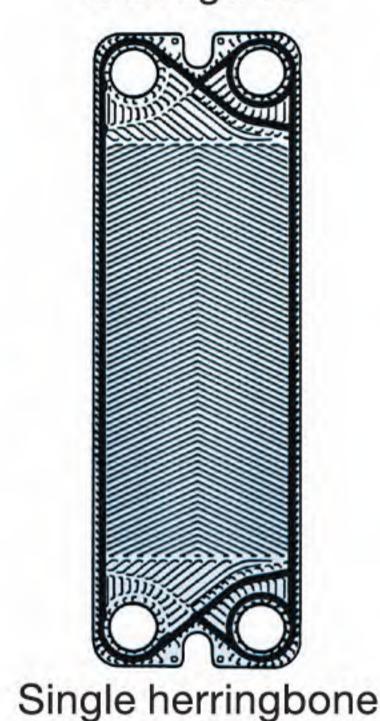
The "herringbone" pattern was named as the V-shaped press grooves resemble the bones of a herring. There are numerous contact points by pilling the V-shaped pressed plates, turning them 180° in an alternating pattern. This ensures high pressure resistance, and also the complex flow channels formed by the V-shaped press grooves get high heat transfer performance. Furthermore, including the decreased heat transfer resistance due to the thinner plate results in heat transfer performance three to five times higher than that of S&T heat exchangers.

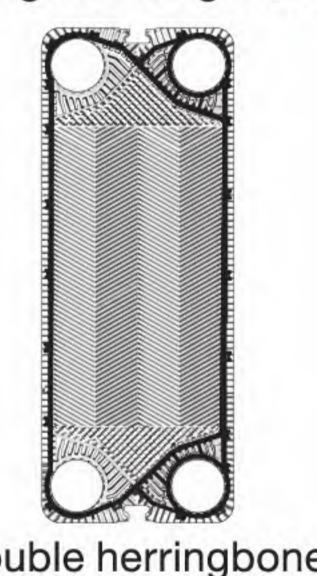
A herringbone pattern with a W-shaped press groove is called a "double herringbone" and is an improved version of the V-shaped herringbone.

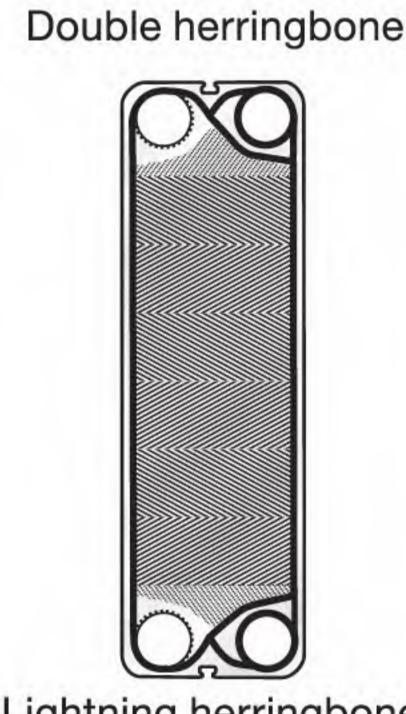
The "lightning herringbone" is a herringbone for higher NTU duty.



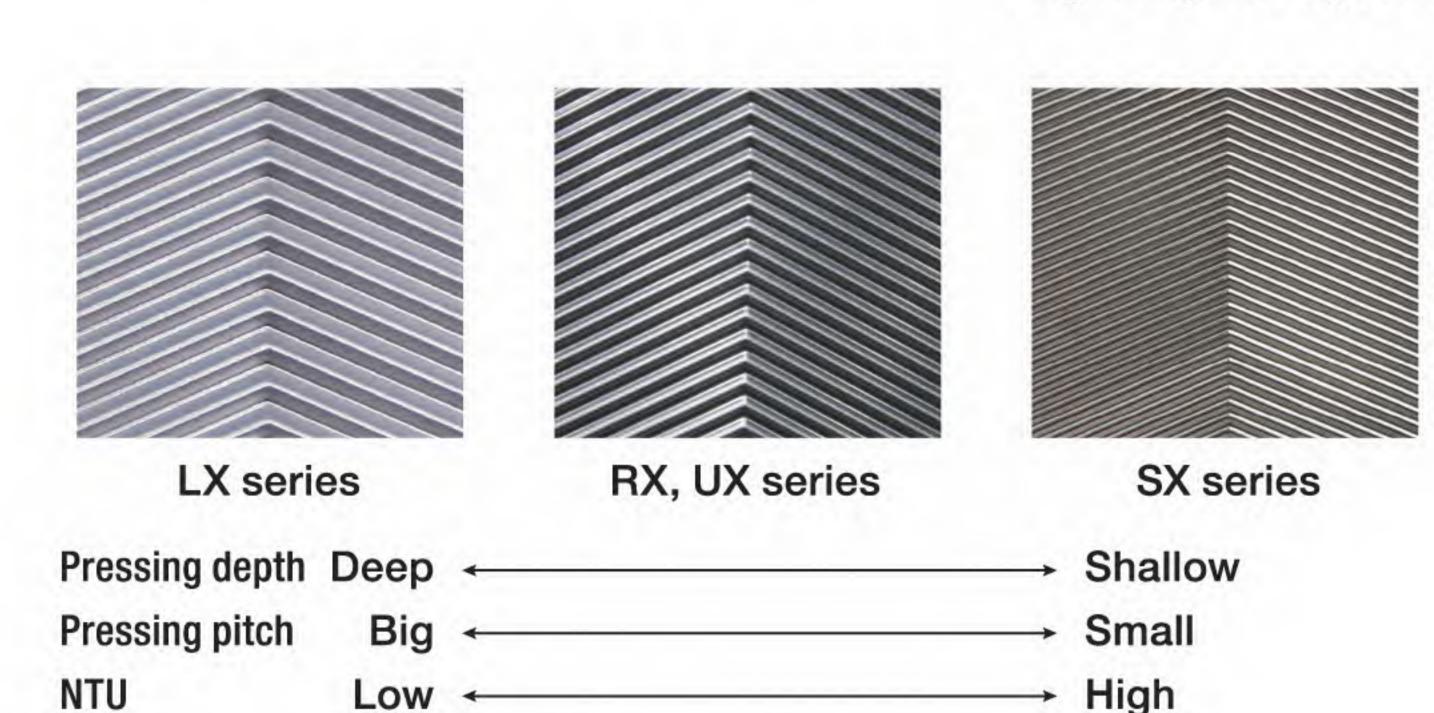
Corrugated







Lightning herringbone



Specific Patterns

In addition to the above plates, we also develop high-functionality plate patterns, such as multi-gap, exclusive condensation use.

\mathbf{N} TU (θ)

NTU = 3 is heat recovery performance of 75%

The heat transfer characteristic of each plate are expressed using NTU (Number of Transfer Unit, θ) and are defined as follows.

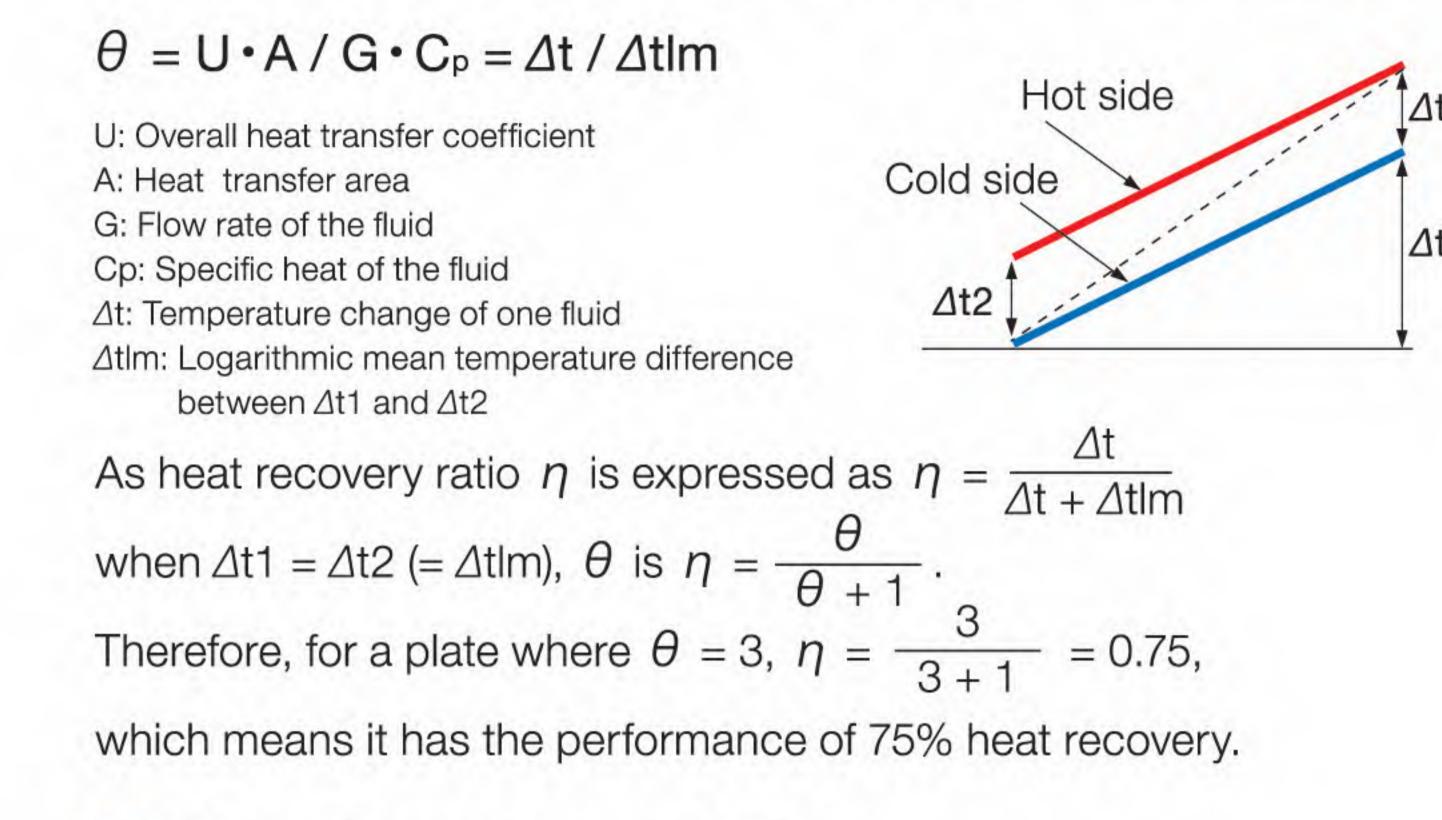
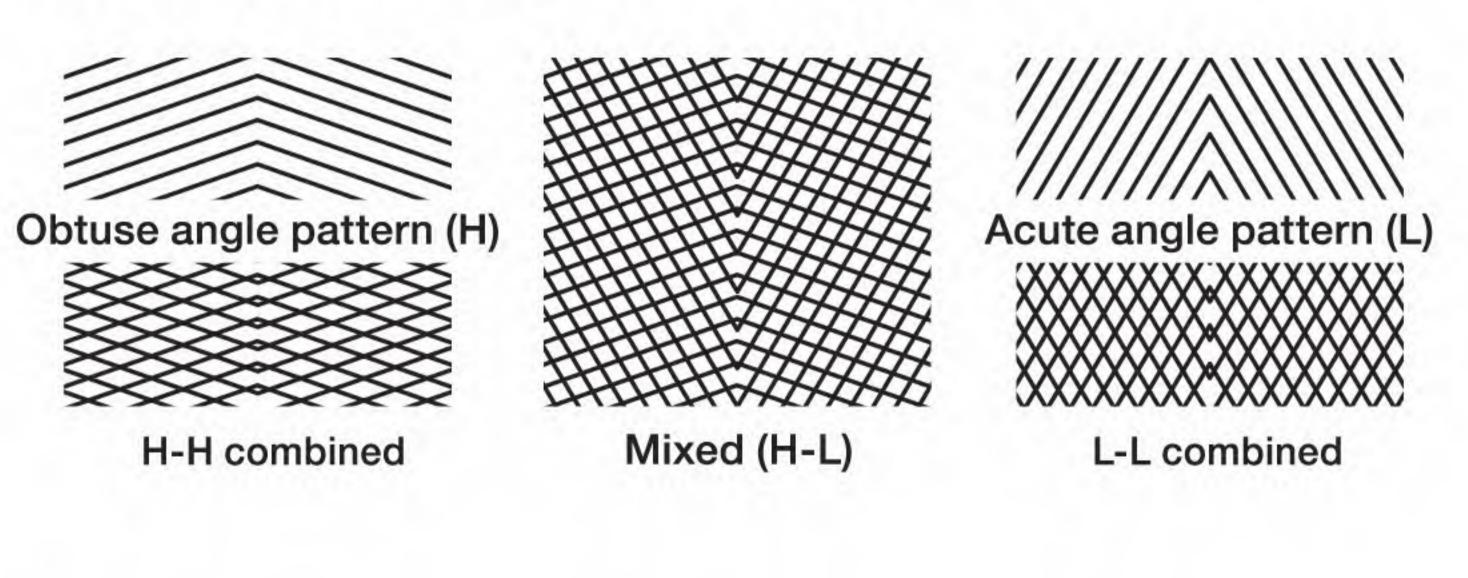
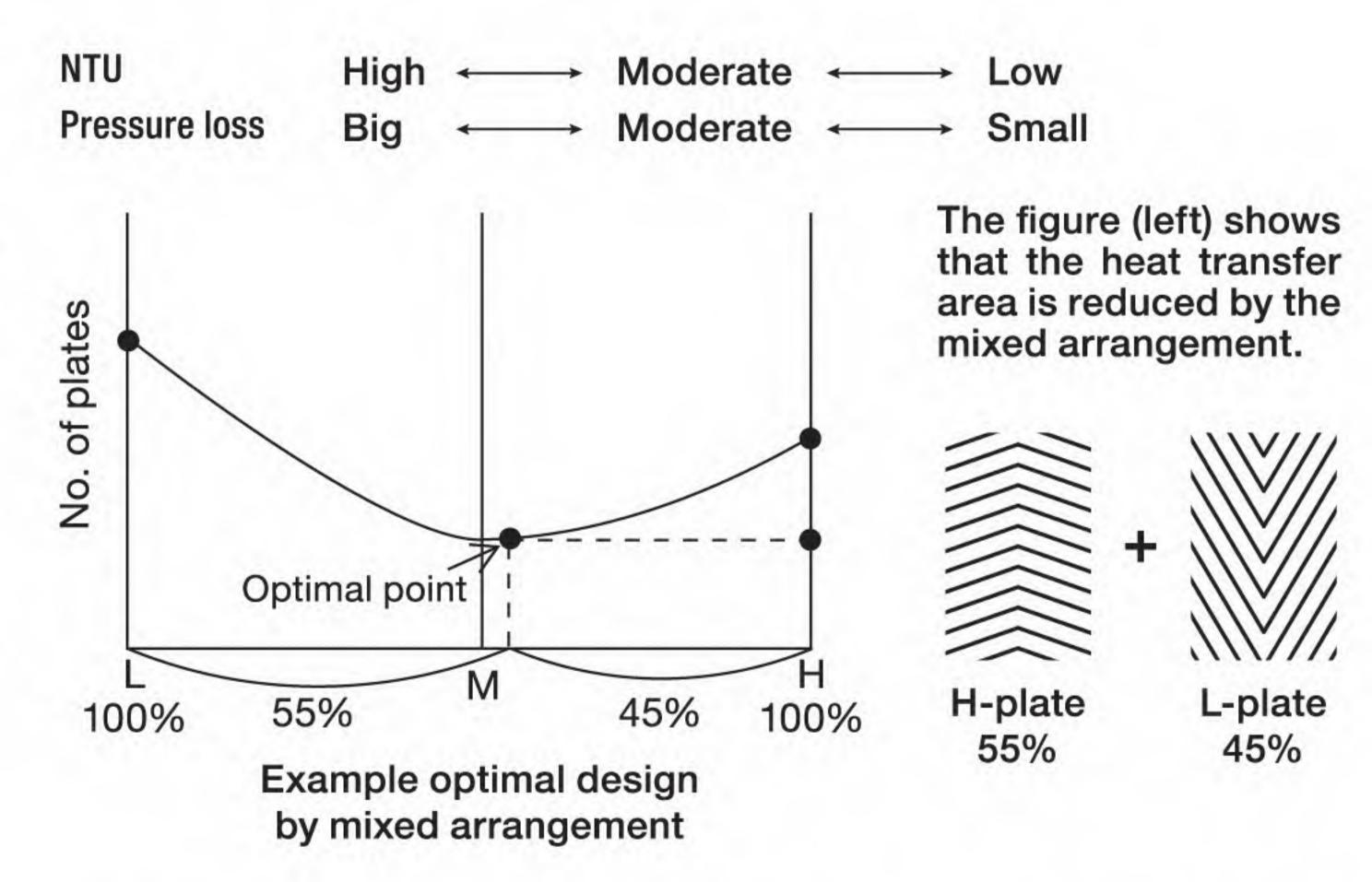


Plate Patterns and NTU

There are two types of herringbone pattern plates; one where the V (W) angle is obtuse (H-plate), and one where it is acute (L-plate). Combining H-plates and L-plates can allow for three types of different flow channels; H-H, H-L, and L-L. Our optimal design method which combines plates, known as the "mixed arrangement," can decrease the heat transfer area by approx. 25% compared to designs with a single plate.





This case shows a mixed arrangement wherein there are 55 H-plates and 45 L-plates for a total of 100 plates.

Two plates form one channel, so there are 45 M channels (H-L) and 5 H channels (H-H). The number of plates is significantly reduced compared to a case with only H channels case.

Gaskets

Gaskets used in plate heat exchangers must have durability in various liquid qualities and temperature / pressure conditions. Hisaka has prepared the following gasket materials in order to support a wide variety of applications.

Standard material: NBR, EPDM (ethylene propylene rubber), IIR (butyl rubber) Special material: FPM (fluororubber), silicon, PTFE cushion gasket

1. Slit-in Gasket (Glue-free type)

These plate gaskets do not need glue. The slit-in gasket is especially recommended for those applications where frequent replacement of the gasket is required. Further, without the glue, glue odor is reduced. The slit-in type gasket is suitable for applications such as water treatment or food processing.

(D-plate gaskets and distance piece gaskets use glue. Also, some plates do not support slit-in gaskets.)

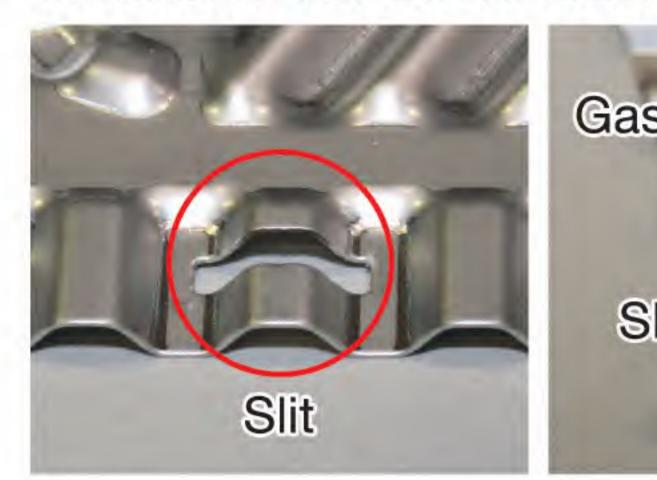
2. NEW-EPDM (N-EPDM)

Usually, EPDM gasket is selected either for high temperature or aggressive fluid applications. Although EPDM gaskets are high quality, rubber gaskets lose elasticity as time passes. A cutting edge N-EPDM gasket, newly developed by Hisaka, was introduced. The N-EPDM gasket improves both the heat and chemical resistance. The life-time is two times higher than conventional EPDM. Originally invented specifically for the CO2 chemical recovery process, the N-EPDM is useful for other applications with many advantages.

3. PTFE Cushion Gaskets (TCG)

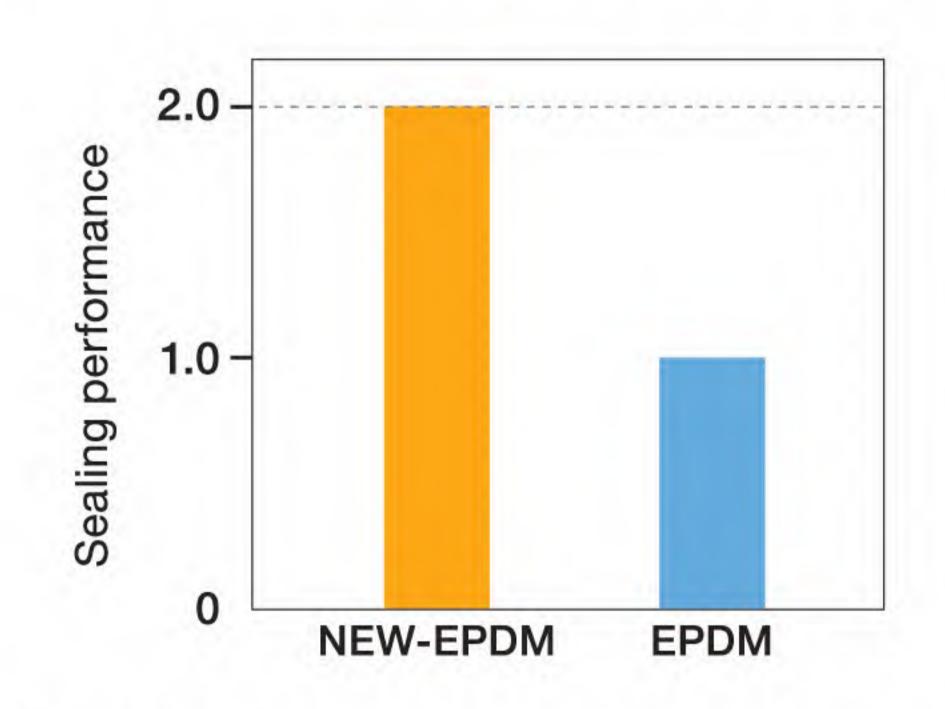
Through our own development, HISAKA has pioneered PTFE Cushion Gaskets for the Plate Heat Exchanger. It is normally used in applications where conventional synthetic rubber would have limitations due to the corrosiveness of the fluid being handled. With this new development, the Plate Heat Exchangers can be applied in a wider variety of applications than before due to the chemical resistance and the durability of PTFE. Due to the elastic core of the TCG gasket, it does not require strong tightening torque during the assembly of the unit. Thus, it reduces the risks of plate deformation by over tightening. A TCG gasket can be used for one side only, if the noncorrosive fluid is running in the other side where a conventional gasket can be used.

Installation of Slit-in Gaskets



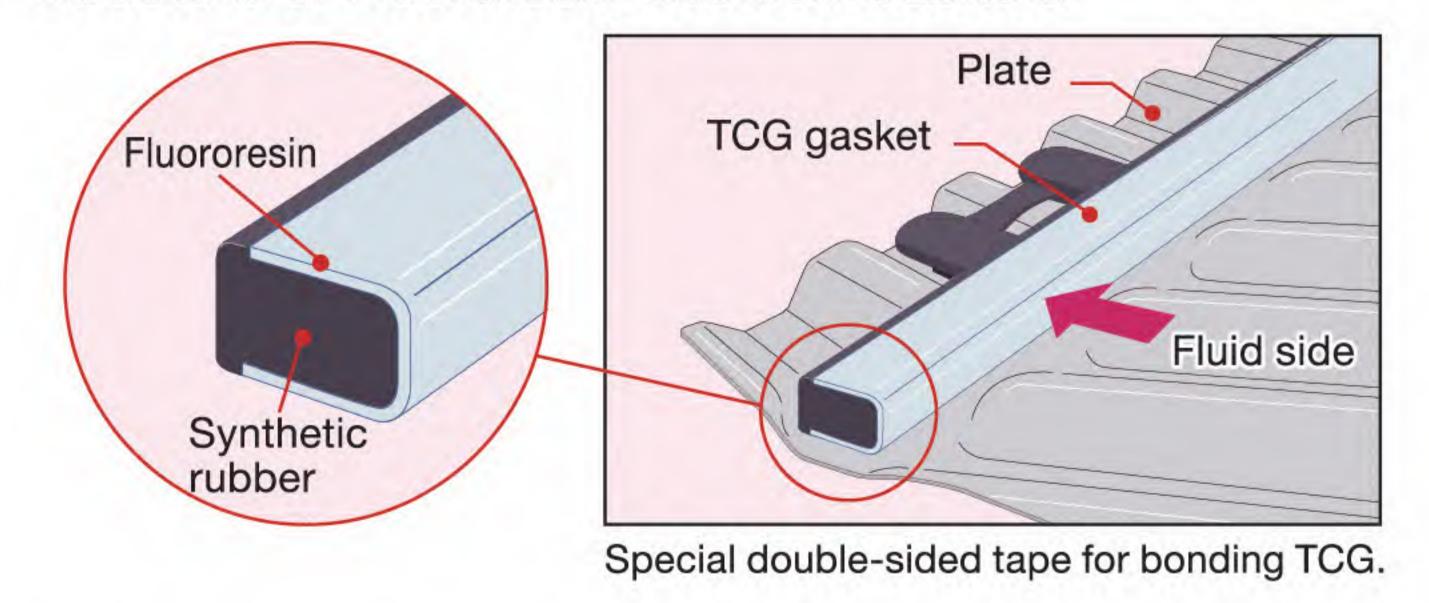


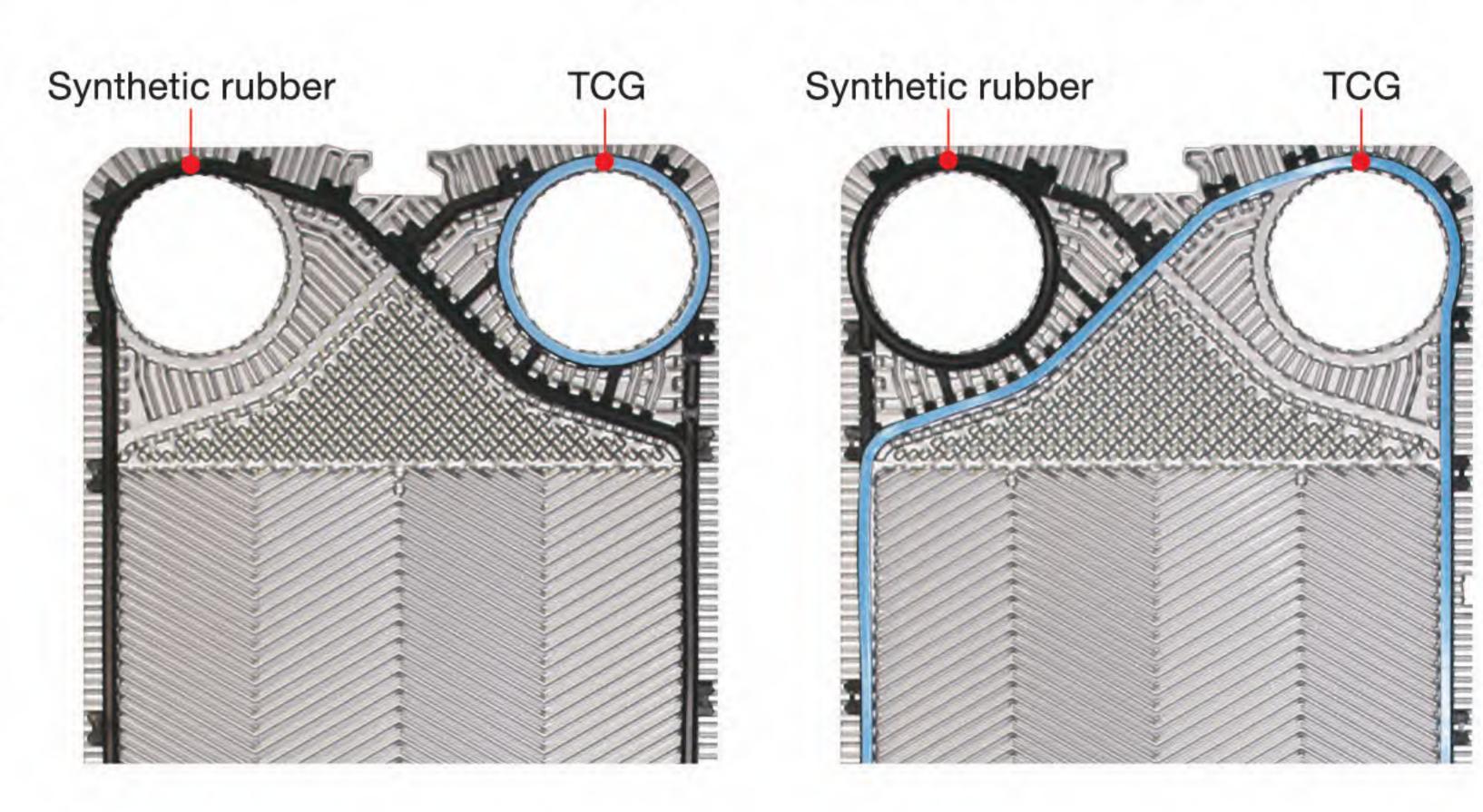
Life time of NEW-EPDM and EPDM (180°C)



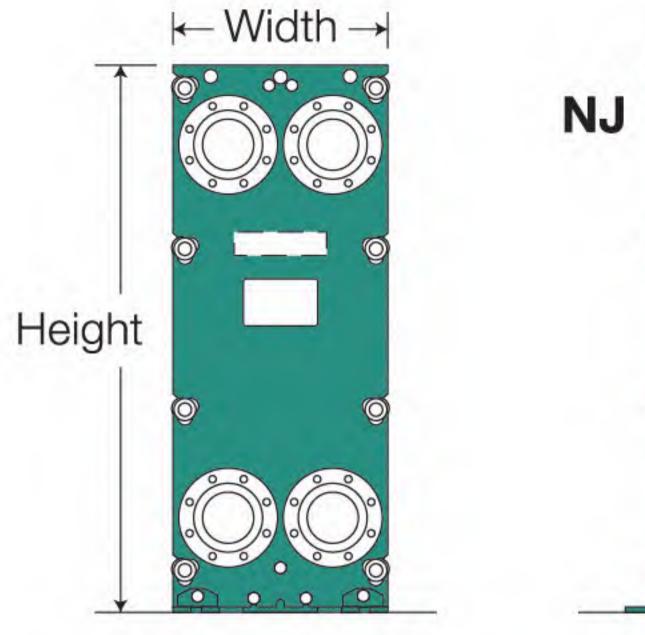
The above compares the sealing performance of the conventional EPDM and the NEW-EPDM. The NEW-EPDM can realize a better heat resistance compared to the conventional EPDM and achieves long time operation.

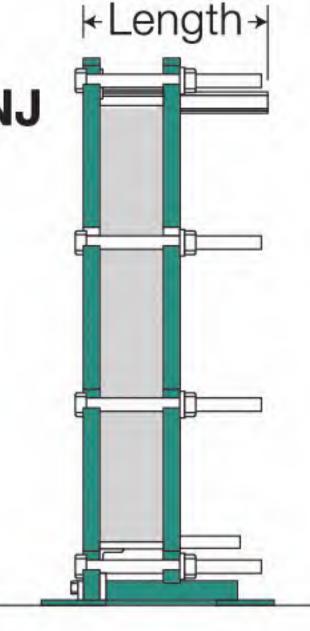
Structure of Fluororesin Cushion Gaskets

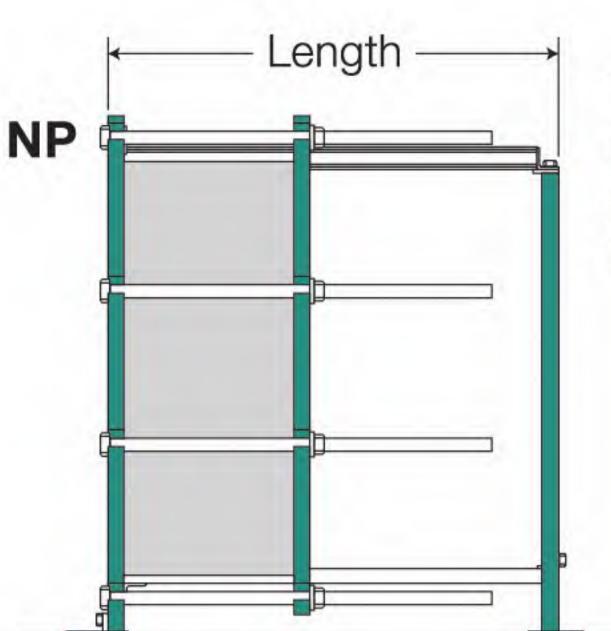




Dimensions and Weight







The standard frame is connection type.

Piping is connected directly to the S-frame / E-frame using the stud bolts / nuts on the connection holes of the frame.

For the frame model number, refer to P5.

	Installation height	Installation width			He	at transfer a	rea and inst	tallation leng	th / weight (Top: Installa	tion length	(mm) / Botto	m: Weight (k	(g))				
Model	(mm)	(mm)	0.2m ²	0.4m ²	0.6m ²	0.8m ²	1m²	5m ²	10m²	15m²	30m ²	60m²	100m²	200m²	500m ²	800m²	1,200m ²	1,600m²
RX-00	488	242					400 50											
RX-10	1,177	460					396	396	396	836	1,036							
		100					345	380	427	478 816	615 816	1,216	1,416	1,616				
RX-30	1,900	650								1,086	1,222	1,530	1,924	2,932				
RX-50	2,231	950									913	1,113	1,513	2,113	3,513			
DV 70	0.504	000									1,983	2,289	2,708 1,760	3,730 2,260	6,169 4,010			
RX-70	2,584	900										2,620	3,030	4,150	7,880	4.01.0		0.000
RX-90	3,140	1,370											1,762 5,890	2,012 6,950	3,012	4,012	5,512	6,262
LX-00	857	350					418	518										
							170 396	210 396	836	1,336								
LX-10	1,066	460					310	364	433	508								
LX-30	1,675	650							1,000	816 1,050	1,016	1,616	2,216					
1 7 50	2,045	810							1,000	1,000	913	1,113	1,513	2,313				
LX-50	2,045	810									1,920	2,350	2,900	4,310	4.010	5510		
LX-90	2,418	1,480										1,007 3,830	1,257 4,390	2,007 5,840	4,010 11,200	5,510 15,870		
SX-10	1,590	360					426	426	426	426	726	926	1,526					
							280	310	340	390 620	500 820	730 1,020	1,030	2,020				
SX-20	1,870	540								950	1,050	1,250	1,520	2,220				
SX-30	2,683	634									713 1,670	913	1,113 2,120	1,713 2,800	2,913 4.970	3,713 6,170	-	
CV 40	0.100	005									1,070	913	1,113	1,513	3,113			
SX-40	2,166	805										2,040	2,400	3,290	6,210	0.510		
SX-70	2,692	1,090												1,510 4,220	2,510 6,270	3,510 8,750		
SX-80	2,929	1,300											1,757	1,757	2,507	3,757	4,507	
													4,180	5,130	8,160 3,000	11,270 4,000	14,820	6,300
SX-90	3,410	1,290													8,800	11,200	15,300	18,700
UX-005	331	160	201	201	209	209												
UX-10	1,115	408					392	392	832	832	1,032							
OX 10	1,110	100					264	300	353	398 608	556 808	1,008	1,608	2,608				
UX-30	1,891	610								970	000	1,000	1,000	2,000				
UX-30L	2,434	582									712	912	1,112	1,712 2,000				
UX-90	2,020	1,300									1,110	1,270	1,400	2,000	2,757	4,007		
07-90	2,929	1,300													8,740	13,210		C E O -
UX-100	3,780	1,570													2,757 12,370	4,007 15,990	5,257	6,507 26,880
UX-130	4,300	1,570													2,262	3,012		
															13,110	16,520 2,852	21,830 3,732	26,520 4,632
UX-160	4,250	1,900													23,000	26,140	30,360	34,640
WX-10	1,222	500						400 449	832 499	1,032 546	1,333 716							
WX-50	2,233	820						110	100	0.10	, 10		1,513	2,443				
117.30	2,200	OLU											3,123	4.190	3,300	4,600		
WX-90	2,829	1,450													7,100		-	
CX-00	915	346					310	410	510									
CX-10	005	240					160 328	180 328	210 638	838								
1 . A = []	895	346					170	209	267	325								
OX 10						3		000	000	1000								
CX-20	1,114	470						636 370	836 400	1036 440								

Note: The dimensions and weight are subject to change without notice.

Plate Types and Dimensions

			Frame standard type			
Type	Main specification	ons	Width and Height	NJ type	NP type	
	Max. flow rate / unit	~20m³/h				
	Max. working pressure	2.0MPaG		402		
RX-00	Max. working temperature	180℃				
	Max. heat transfer area / unit	1m ²	© 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
	Connection Dia.	20A				
	Max. flow rate / unit	197m³/h		388~405	<u>+</u> 828~1,345 →	
	Max. working pressure	2.7MPaG				
RX-10	Max. working temperature	180℃				
	Max. heat transfer area / unit	30m²				
	Connection Dia.	100A	 ←460 →			
	Max. flow rate / unit	445m³/h	1 50 0 102		← —606~2,836—	
	Max. working pressure	1.8MPaG	08			
RX-30	Max. working temperature	180℃	850~1.			
	Max. heat transfer area / unit	200m²				
	Connection Dia.	150A	-650→			
	Max. flow rate / unit	923m³/h			913~3,513	
	Max. working pressure	2.1MPaG	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z			
RX-50	Max. working temperature	180℃	85~2,9			
	Max. heat transfer area / unit	500m²				
	Connection Dia.	200A	-820~950→			
	Max. flow rate / unit	1,286m³/h			1,760~5,760 –	
	Max. working pressure	1.3MPaG	- 284			
RX-70	Max. working temperature	150℃	434~8			
	Max. heat transfer area / unit	500m²				
	Connection Dia.	250A	+ 900→			
	Max. flow rate / unit	3,167m³/h			1,762~7,012 -	
	Max. working pressure	1.6MPaG	4 000			
RX-90	Max. working temperature	130℃	066 °3.			
	Max. heat transfer area / unit	1,600m²	is			
	Connection Dia.	400A	1,370→			

Note: The above data are subject to change without notice.

Plate Types and Dimensions

Type	Main appoificati	ana	Frame standard type			
Туре	Main specification	ons	Width and Height	NJ type	NP type	
	Max. flow rate / unit	69m³/h		←418~518→		
	Max. working pressure	1.8MPaG				
1 V 00	Max. working temperature	180℃	857			
LX-00	Max. heat transfer area / unit	5m ²				
	Connection Dia.	50A	4 350 →			
	Max. flow rate / unit	197m³/h		388~396	 828~1,336	
	Max. working pressure	1.6MPaG				
LX-10	Max. working temperature	180℃	990'			
	Max. heat transfer area / unit	15m²				
	Connection Dia.	100A	460→			
	Max. flow rate / unit	481m³/h			606~4,221—	
LX-30	Max. working pressure	1.25MPaG	575~1,675-			
	Max. working temperature	180℃				
	Max. heat transfer area / unit	100m²				
	Connection Dia.	150A	650			
	Max. flow rate / unit	791m³/h			713~3,313—	
	Max. working pressure	1.25MPaG				
LX-50S	Max. working temperature	180℃	27 - 1.2 - 27 - 1.2 - 27 - 2.3			
	Max. heat transfer area / unit	150m²	4			
	Connection Dia.	200A	810			
	Max. flow rate / unit	791m³/h	1 59 200		713~3,313—	
	Max. working pressure	1.25MPaG	4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
LX-50	Max. working temperature	180℃	995~2. 0			
	Max. heat transfer area / unit	200m²				
	Connection Dia.	200A	810			
	Max. flow rate / unit	3,230m³/h			1,007 to 5,760—	
	Max. working pressure	1.6MPaG	2.418			
LX-90	Max. working temperature	130℃	2,318 to 8			
	Max. heat transfer area / unit	800m²	di Contraction de la contracti			
	Connection Dia.	400A	1,480			

Note: The above data are subject to change without notice.

Plate Types and Dimensions

T			Frame standard type			
Type	Main specification	ons	Width and Height	NJ type	NP type	
	Max. flow rate / unit	80m³/h			426 to 1,526	
	Max. working pressure	2.0MPaG				
SX-10	Max. working temperature	100°C	1,590			
	Max. heat transfer area / unit	100m²				
	Connection Dia.	50A	+360+			
	Max. flow rate / unit	220m³/h			←620~2,020→	
	Max. working pressure	3.0MPaG				
SX-20	Max. working temperature	100℃	0.1870			
	Max. heat transfer area / unit	200m²				
	Connection Dia.	100A	-540→			
	Max. flow rate / unit	445m³/h			713 to 3,713 —	
	Max. working pressure	3.0MPaG				
SX-30	Max. working temperature	100℃	-2,683			
	Max. heat transfer area / unit	600m ²				
	Connection Dia.	150A	-634 -			
	Max. flow rate / unit	940m³/h	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		<u>←</u> 758~3,757 —	
	Max. working pressure	2.4MPaG				
SX-40	Max. working temperature	110°C (100°C for some cases)	2,166			
	Max. heat transfer area / unit	500m²				
	Connection Dia.	200A	-805→			
	Max. flow rate / unit	1,337m³/h		1,51	0~4,510	
	Max. working pressure	3.0MPaG				
SX-70	Max. working temperature	100℃	2,692			
	Max. heat transfer area / unit	800m ²				
	Connection Dia.	250A	← 1,070~1,090 →			
	Max. flow rate / unit	2,424m³/h			1,510~4,510 —	
	Max. working pressure	2.0MPaG	7.192			
SX-80	Max. working temperature	180℃	29 to 4			
	Max. heat transfer area / unit	1,600m²	6. C.			
	Connection Dia.	350A	<u>1,300</u>			
	Max. flow rate / unit	2,565m ³ /h		1,7	762~6,262 — — — — — — — — — — — — — — — — — —	
	Max. working pressure	2.0MPaG	3,410-	A I I I I		
SX-90	Max. working temperature	130℃	310~3			
	Max. heat transfer area / unit	1,600m²	3,33			
	Connection Dia.	350A	1,290			

Note: The above data are subject to change without notice.

Plate Types and Dimensions

Type	Main specificati	ons	Fra	me standard ty	pe	
Type	Iviain Specificati	OHS	Width and Height	NJ type	NP type	
	Max. flow rate / unit	15m³/h	160	205~209		
UX-005*	Max. working pressure	0.5MPa				
	Max. working temperature	150℃	© ©			
	Max. heat transfer area / unit	0.828m ²				
	Connection Dia.	20A	000			
	Max. flow rate / unit	97m³/h		385~400	← 825~1,440—	
	Max. working pressure	2.5MPaG				
UX-10	Max. working temperature	150℃				
	Max. heat transfer area / unit	30m ²				
	Connection Dia.	50A	+ 408 +			
	Max. flow rate / unit	285m³/h			598~2,821 —	
	Max. working pressure	2.2MPaG	168.			
UX-30	Max. working temperature	180℃	841~1			
	Max. heat transfer area / unit	200m²				
	Connection Dia.	100A	← 610 →			
	Max. flow rate / unit	285m³/h	582		712~2912	
	Max. working pressure	2.0MPaG				
UX-30L	Max. working temperature	160℃	45 []			
	Max. heat transfer area / unit	400m ²	72			
	Connection Dia.	100A				
	Max. flow rate / unit	2,314m ³ /h			1,760~5.760—	
	Max. working pressure	1.7MPaG	626			
UX-90	Max. working temperature	150℃	250~5			
	Max. heat transfer area / unit	800m ²				
	Connection Dia.	350A	1,300 →			
	Max. flow rate / unit	4,948m³/h		2,	262~8,262	
	Max. working pressure	1.3MPaG	3.780			
UX-100	Max. working temperature	100℃	630~3			
	Max. heat transfer area / unit	1 600m²	e i			
	Connection Dia.	500A	1,570 →			
	Max. flow rate / unit	4,948m³/h		2.	262~8,262	
	Max. working pressure	1.3MPaG	1.30			
UX-130	Max. working temperature	100℃	270~7			
	Max. heat transfer area / unit	1,600m²	4.			
	Connection Dia.	500A	1.570 →			
	Max. flow rate / unit	7,300m³/h		Up to 8	3,900	
	Max. working pressure	2.3MPaG	S20 S20			
UX-160	Max. working temperature	100°C	Up to 4			
	Max. heat transfer area / unit	4,300m²				
	Connection Dia.	600A	Up to 1,900			

Note: The above data are subject to change without notice. *UX-005 is available in Malaysia standard frame

Plate Types and Dimensions

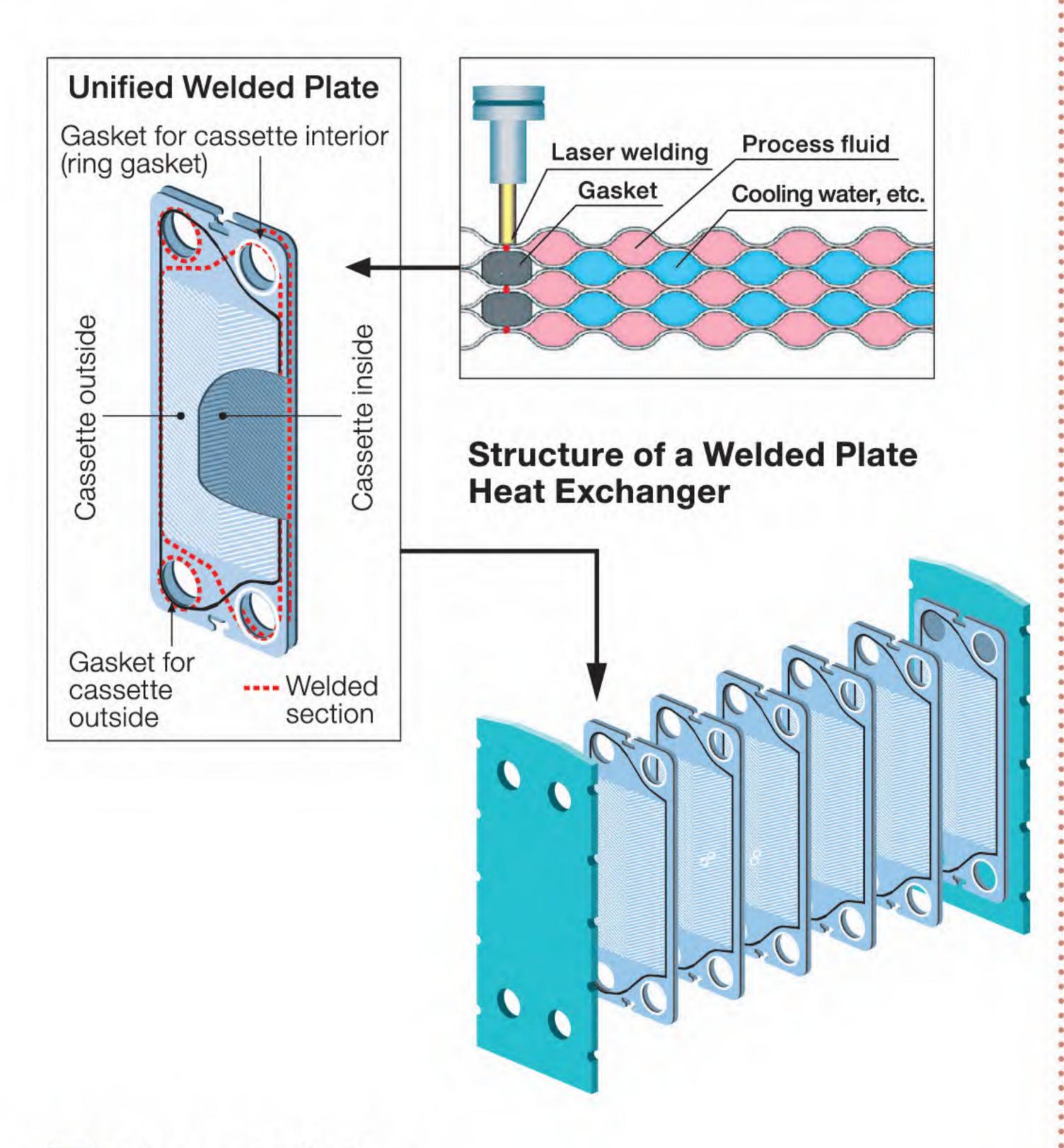
T			Frame standard type				
Type	Main specificati	ons	Width and Height	NJ type	NP type		
	Max. flow rate / unit	209m³/h		392~506	832~1,851		
	Max. working pressure	4.8MPaG	22.2.				
WX-10	Max. working temperature	180℃					
	Max. heat transfer area / unit	30m ²					
	Connection Dia.	100A	→ 000 → 500 →				
	Max. flow rate / unit	791m³/h			1,002~3,352		
	Max. working pressure	4.1MPaG					
WX-50	Max. working temperature	180℃	- 2,233				
	Max. heat transfer area / unit	200m²					
	Connection Dia.	200A	-820→				
	Max. flow rate / unit	2,208m³/h			1,760~5.760		
	Max. working pressure	2.3MPaG	60				
WX-90	Max. working temperature	150℃	2,82				
	Max. heat transfer area / unit	800m²					
	Connection Dia.	350A	← 1,450 →				
	Max. flow rate / unit	80m³/h	346	310 ~ 510			
	Max. working pressure	3.20MPa					
CX-00	Max. working temperature	150℃	g 0 0				
	Max. heat transfer area / unit	12.3m ²					
	Connection Dia.	50A					
	Max. flow rate / unit	108m³/h		325~336	635~846		
CX-10*	Max. working pressure	1.9MPaG					
Vertical	Max. working temperature	150℃	6 6				
Horizontal	Max. heat transfer area / unit	15m²					
	Connection Dia.	50A	<u>→ 2012 ~ 210</u> → 346 →				
	Max. flow rate / unit	170m³/h	< 470		628~1345		
	Max. working pressure	2.85MPa					
CX-20	Max. working temperature	150℃	4 0 0				
	Max. heat transfer area / unit	27m ²					
	Connection Dia.	100A					

Note: The above data are subject to change without notice.

*CX-10 is both vertical and horizontal installation available.

Plate Heat Exchanger Lineup

Semi-welded Plate (WX)



Characteristics

- 1) A couple of plates are laser welded with o-ring at portholes between the plates. One fluid flowing through the inside of the cassettes and the other fluid flowing on the outside of the cassettes.
- 2 As disassembly is possible for each plate cassette, both sides of the plate cassette can be cleaned.
- 3 As plate cassettes is sealed by laser welding except the portholes, this product is fit for high pressure duty, Freon refrigerants or fluids that corrode synthetic rubber.
- There are two types of ring gaskets; a synthetic rubber, and PTFE gasket (TCG) with outstanding chemical resistance.

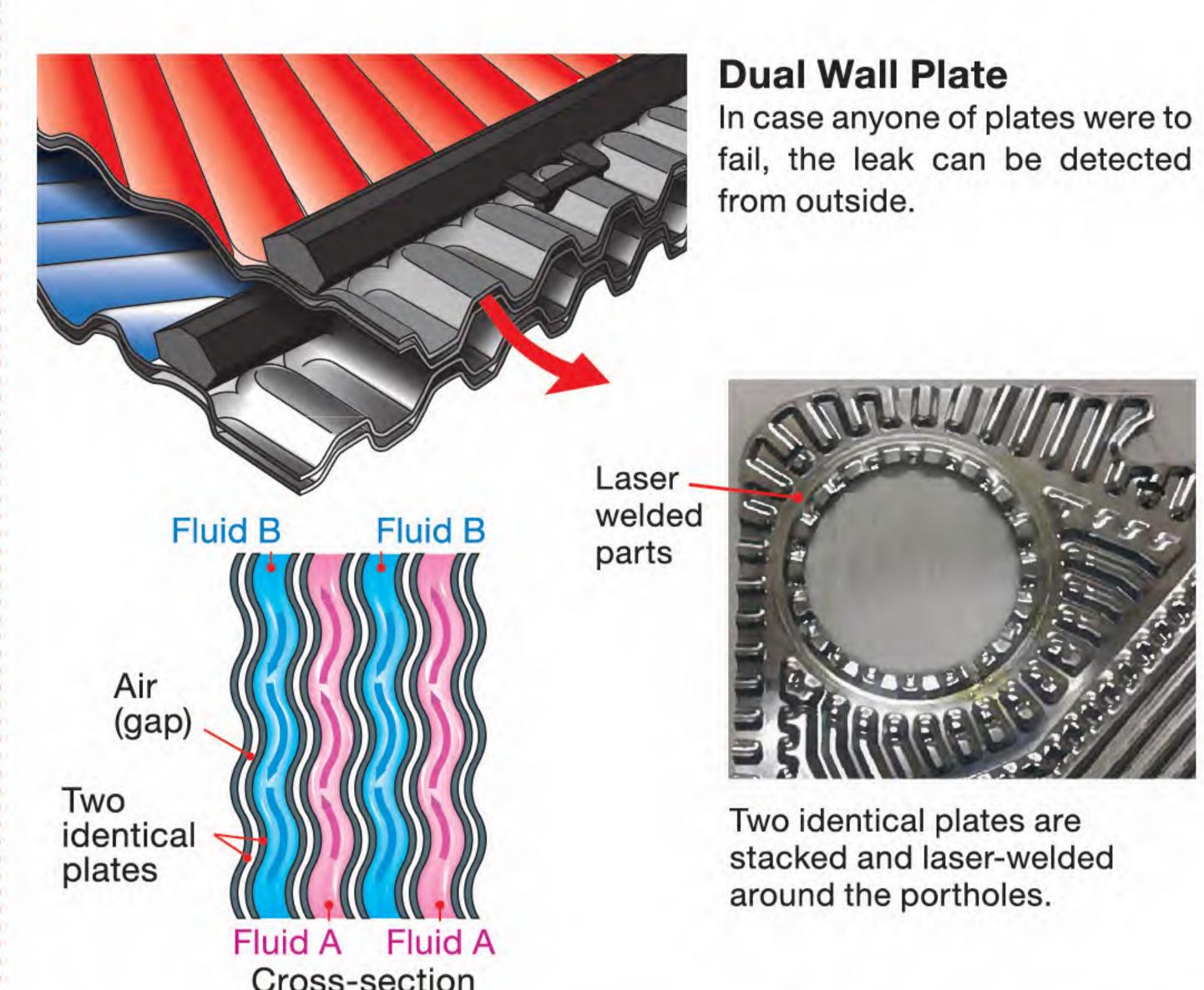
Applications

- 1 Heating / cooling of fluids that corrode synthetic rubber
- 2 Heating / cooling of dangerous fluids such as sulfuric acid
- 3 Heating / cooling for the duty exceeding the heat or pressure resistance of gasket-type plate heat exchangers
- 4 Heating / cooling in refrigeration cycles using refrigerant

Specification

	Conventional model	Welded model
Pressure resistance	Up to 3.0 MPaG	Up to 4.0 MPaG
Heat resistance	150°C	180°C

Dual Wall Plate



The dual wall plate heat exchangers use to achieve "relief and reliance" for preventing contamination of the two fluids.

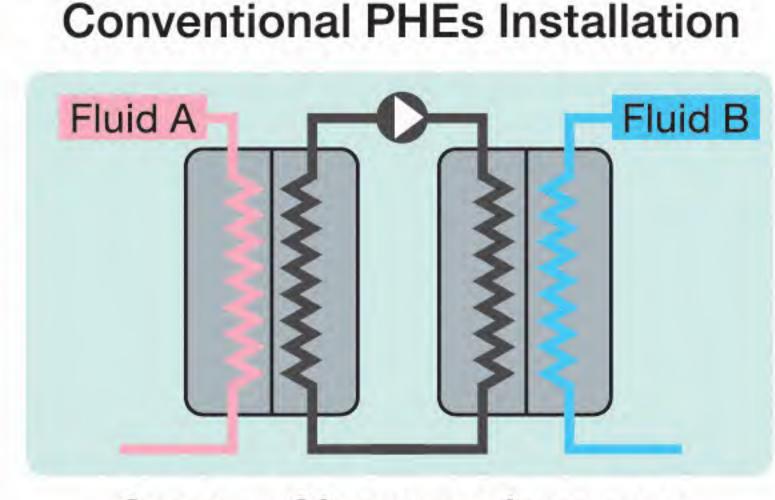
Characteristics

- 1 The dual wall design prevents any leaks from going farther due to the air gap and the second plate. In case any one of plates were to fail, the leak can be detected from outside because of leaking through the gap of the plates.
- 2 To prevent intermixing of the fluids, "Double seal gasket" (refer to P6) system is used. Any leakage of fluids across the gasket can be detected from the outside because the liquid escapes from the units.

Applications

- Ocoling of transformer oil, which might explode if mixed with the cooling water
- 2 Cooling of lubrication or hydraulic oil, which can damage the rotator or hydraulic equipment if mixed with the cooling water
- 3 Heating / cooling of food processing, where there must be no mixing of foreign materials in the product
- 4 Heating / cooling of fuel oil (marine gas oil: MGO) where fatigue breakdown due to highly frequent pulsation
- 6 Heating / cooling in bio-process where the process fluid may cause environmental pollution
- 6 Heating / cooling between fluids where mixing can cause a sudden chemical reaction or generate environmental pollutants

It is normally necessary to install two heat exchangers where it is dangerous if fluid A and fluid B are mixed. However, with the dual wall plate, this is possible with just one unit.



2 sets of heat exchangers in addition to extra pumps and piping.

Fluid A Fluid B

Dual Wall Installation

Only one PHE is enough for the duty.

Plate Heat Exchanger Lineup

EXOLUTION (DXC)



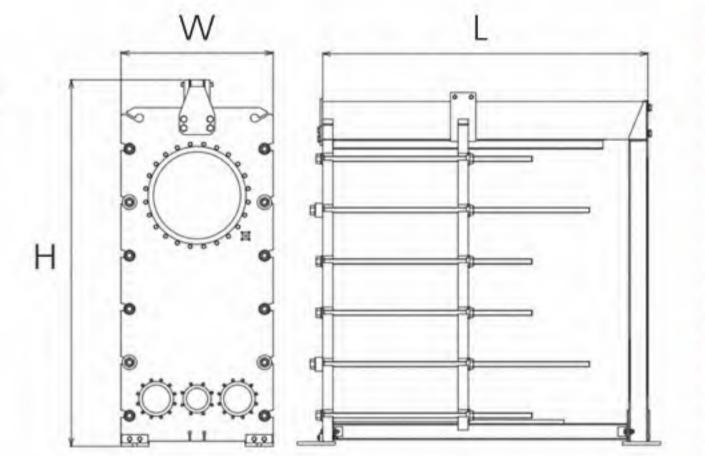
New proposal for condenser with high flow rate to save installation space

Characteristics

- The ultra-large diameter of φ650 enables processing of vapors up to 70,000 m³/h.
- 2 The high density of the heat transfer surface significantly reduces the size, weight and installation space of the equipment compared to Shell & Tube heat exchanger.
- 3 A special flow path structure is adopted, which is different on the condensation side and the cooling side. The system can achieve a low pressure drop suitable for vapor treatment.
- 4 The nozzle layout maximizes the heat transfer length and achieves high heat transfer efficiency.

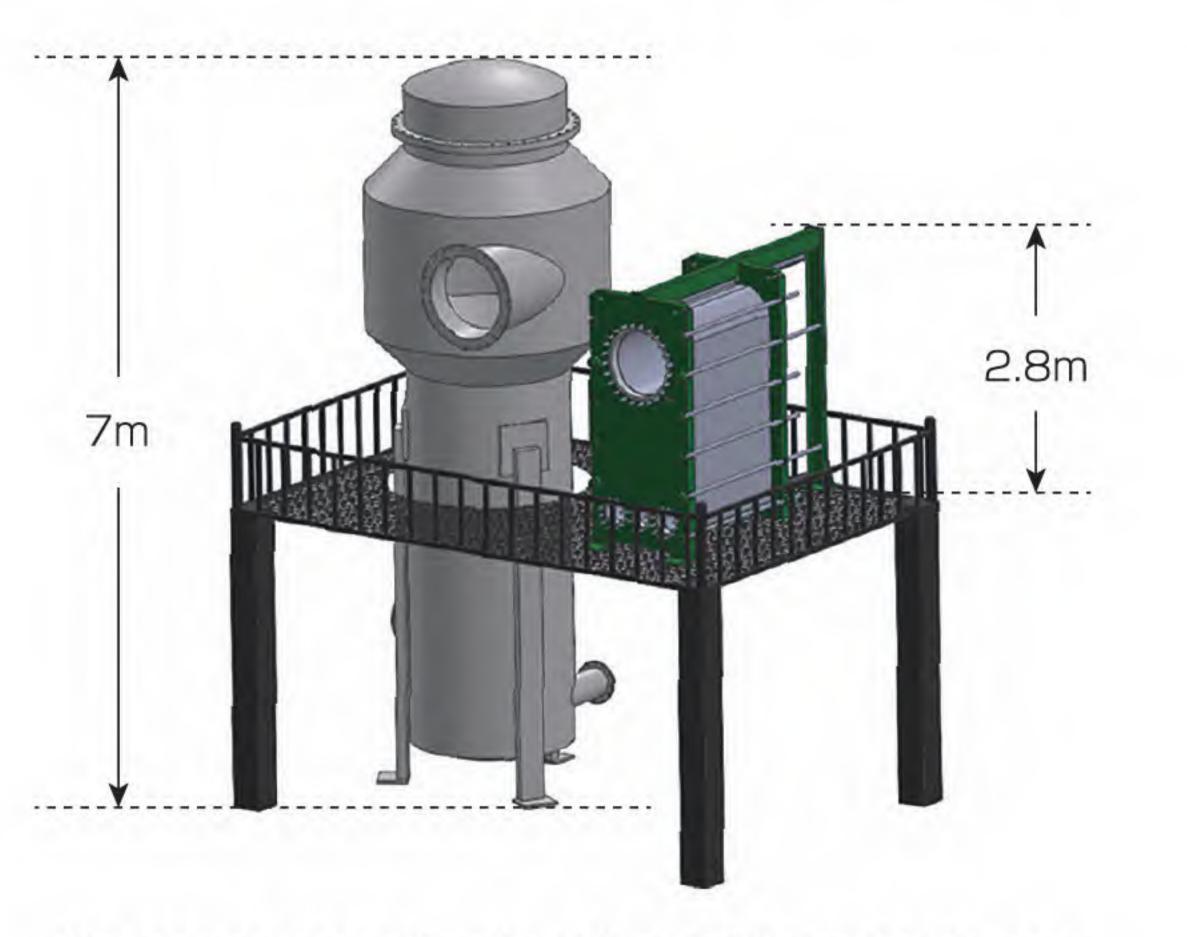
Applications

- 1 Vacuum vapor condenser
- 2 Concentration can condenser
- 3 Replacement of Shell & Tube heat exchanger, etc.



Scope of application

Plate Material	SUS316、SU316L、TP270	
Gasket Material	NBR、EPDM、FPM	
Maximum design temperature	150°C	
Maximum design pressure	0.9MPaG	
Equipment size (reference)	L1750~6250×W1150×H2775	



Size comparison with vertical Shell & Tube heat exchanger

Condenser / Gas Cooler (YX)

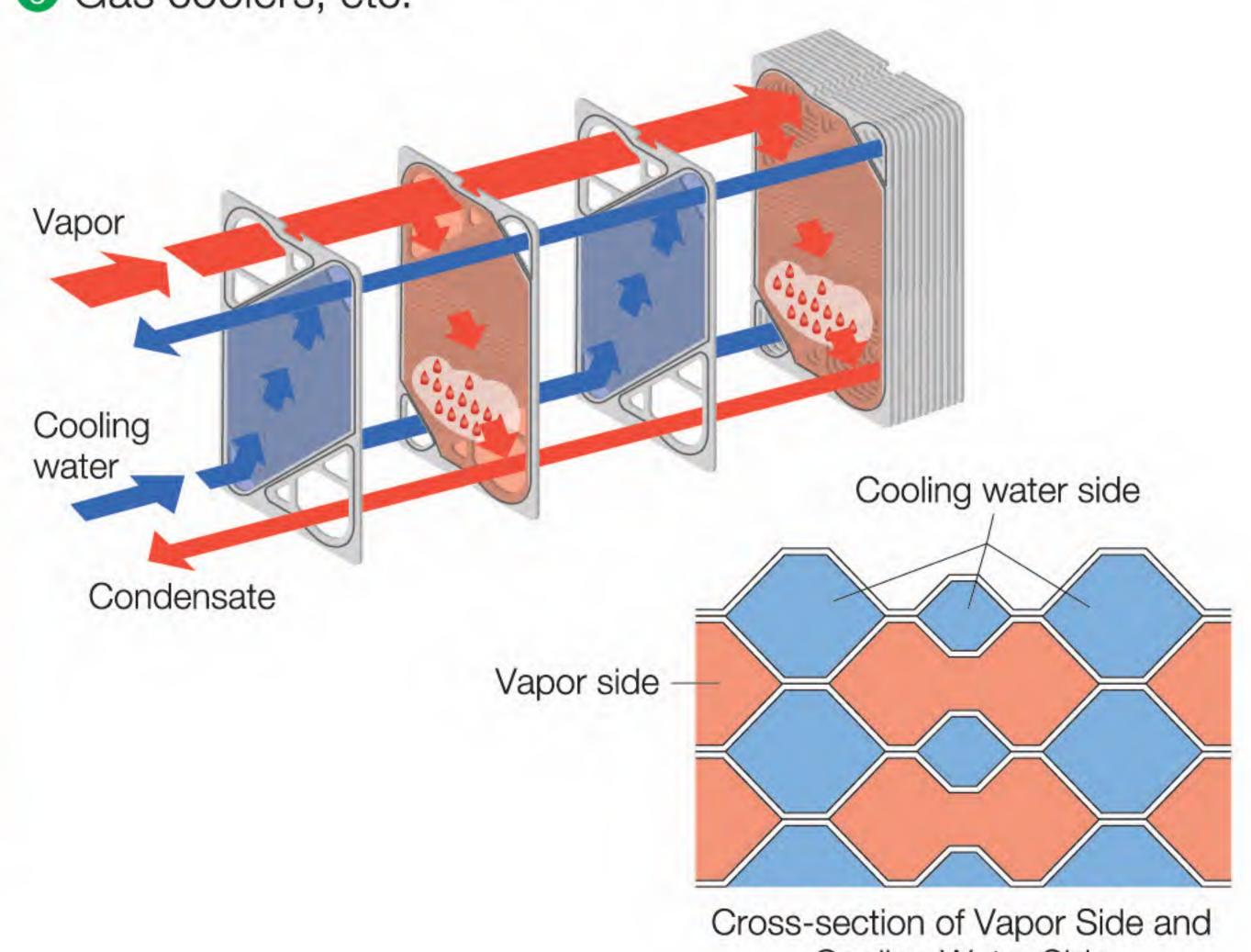


Characteristics

- 1 The heat transfer coefficient is about 2 times higher than that of shell & tube heat exchangers. The condensing surface is always secured and the heat transfer coefficient is improved because condensate is immediately drained out.
- 2 Special considerations are taken for the plate characteristics in order to achieve a much lower vapor pressure drop than conventional Plate Heat Exchangers.
- 3 The cooling water consumption is about half that of S&T heat
- 4) TCG gaskets are selectively used to permit a wide range of applications.
- 5 Less maintenance work, as the plates can be easily cleaned and inspected.
- 6 The vapor connection sizes holes are the same for the inlets and outlets, allowing for use as a cooling condenser for vapor with inert gas.
- 7 Various international Pressure Vessel Code and Standard such as ASME, JIS, CE available.

Applications

- 1 Overhead condensers for various distillation columns
- 2 Condensers / preheaters for evaporators
- 3 Condensers for gas drying / air conditioning
- 4 Heat recovery exchangers from exhaust steam
- 5 Gas coolers, etc.



EXOLUTION (NX-30)



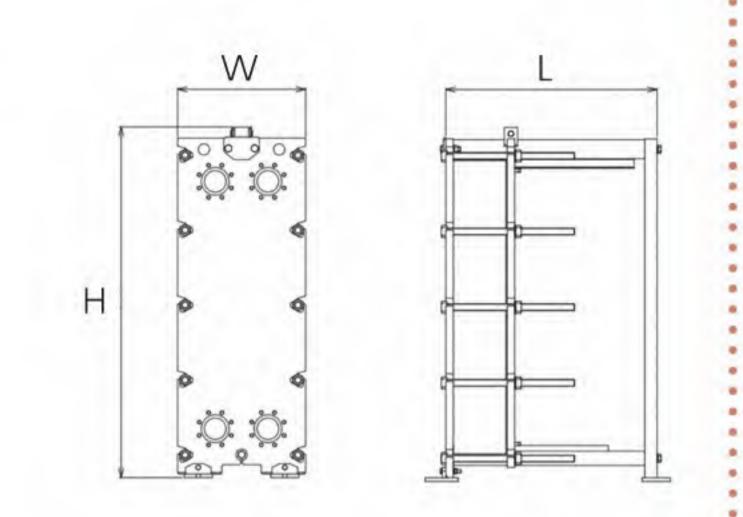
Longer service life due to special construction and safety provided by leakage control

Characteristics

- 1 Double seal line construction with a gasket on the outermost circumference. Oxidative deterioration of the inner gasket can be suppressed.
- 2 The plate thickness is 1.0 mm and a maximum test pressure of 4.0 MPaG has been achieved.
- 3 Even if leakage should occur with the inner gasket, the outermost gasket prevents external dispersal.
- 4 A longer service life of the gasket has been achieved. The replacement cycle of gaskets can be extended.

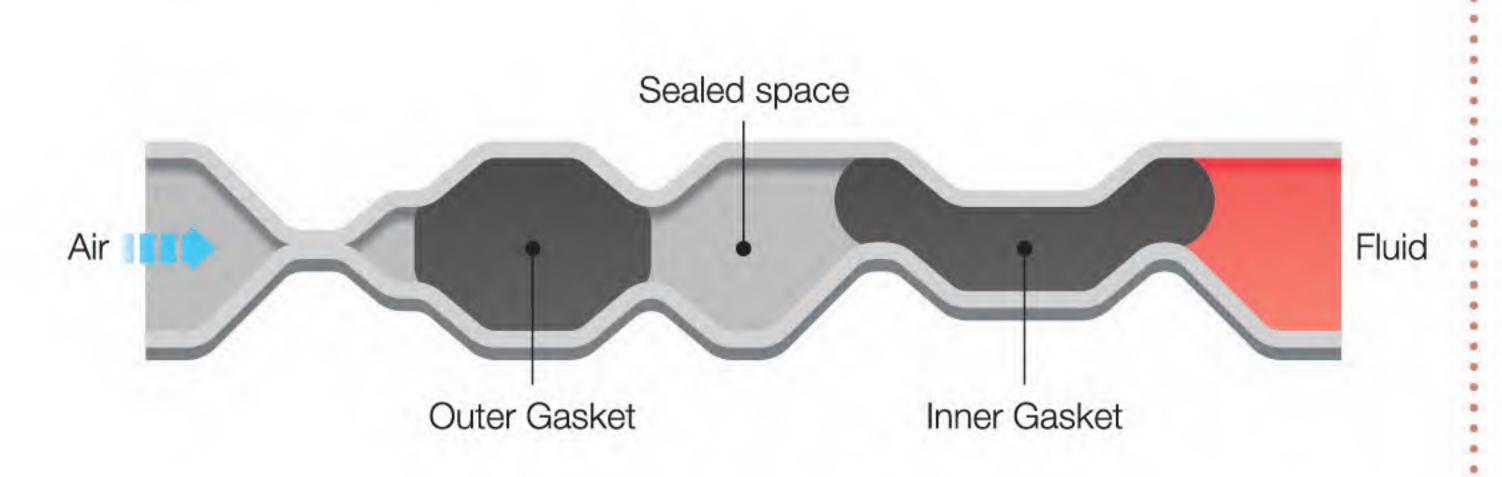
Applications

- 1 Heat recovery in the high temperature range
- 2 Indirect heat exchanger for binary power generation
- 3 Replacement of multi-tube heat exchanger, etc



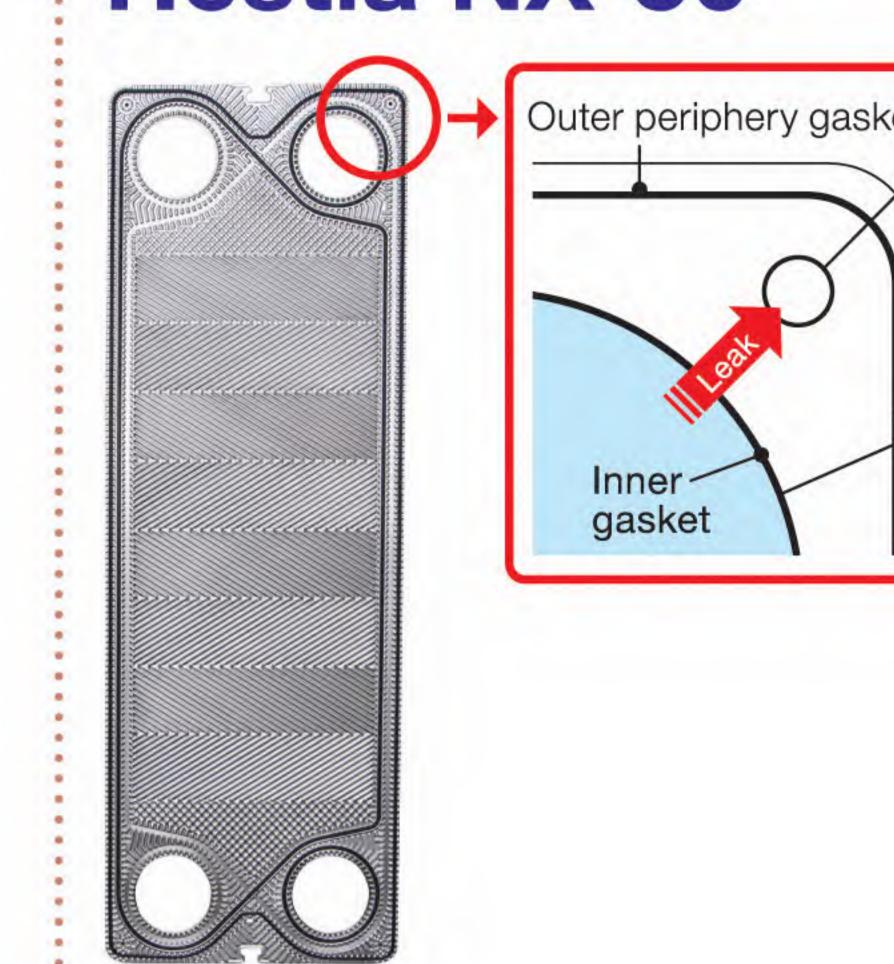
Scope of application

Plate Material	SUS316、SU316L、TP270、NW2200
Gasket Material	NBR、EPDM、FPM
Maximum design temperature	180°C
Maximum design pressure	3.2MPaG
Equipment size (reference)	L712~3912×W710×H1916



Double seal line construction

Double-lined Gasket Plate Hestia NX-50



Leak detection hole

Leak detection Even if a leak from the inner gasket occurs, a leak can

- Double-gasketed line design

Prevention of oxidation degradation This prevents oxidation degradation of the inner gasket due to outside air.

Prevention of dispersal

Dispersion of fluid to outside of the unit is prevented the fluid from reaching outside.

Characteristics

- 1 The double-gasketed line design provides a gasket line to the outermost periphery to inhibit oxidation degradation in the inner gasket (which serves as a seal) from outside air.
- 2 It prevents leakage dispersal. Should a leak occur in the inner gasket, this prevents the fluid from reaching outside.
- 3 To achieve high heat-resistance, the compounding ratio of the gasket has been improved.
- 4 The improved gasket groove and plate pattern increase seal pressure and ensure high pressure-resistance.
- 5 It achieves a life time 5 times longer than Hisaka's conventional Plate Heat Exchangers.
- 6 High heat-resistance and pressure-resistance allow for environments with high temperature of 250°C and seal pressure of 9.5Mpa or higher, which conventional PHE couldn't use.

Applications

1) High temperature / High pressure fluids

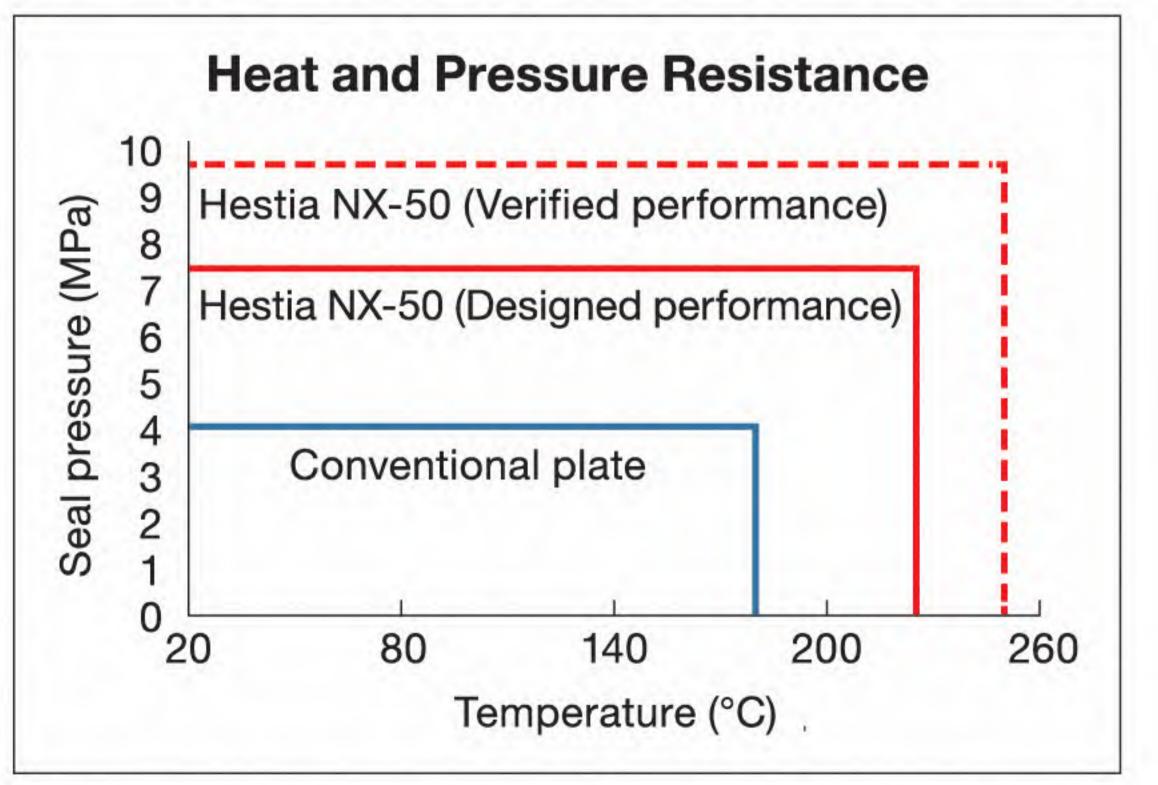
High temperature, high pressure heat exchangers around boilers or the like

Heat exchangers in conventional / nuclear power applications

2 Dangerous fluids

Heat exchangers for flammable and dangerous fluids in locations such as chemical plants

High-Heat / High-Pressure Resistance



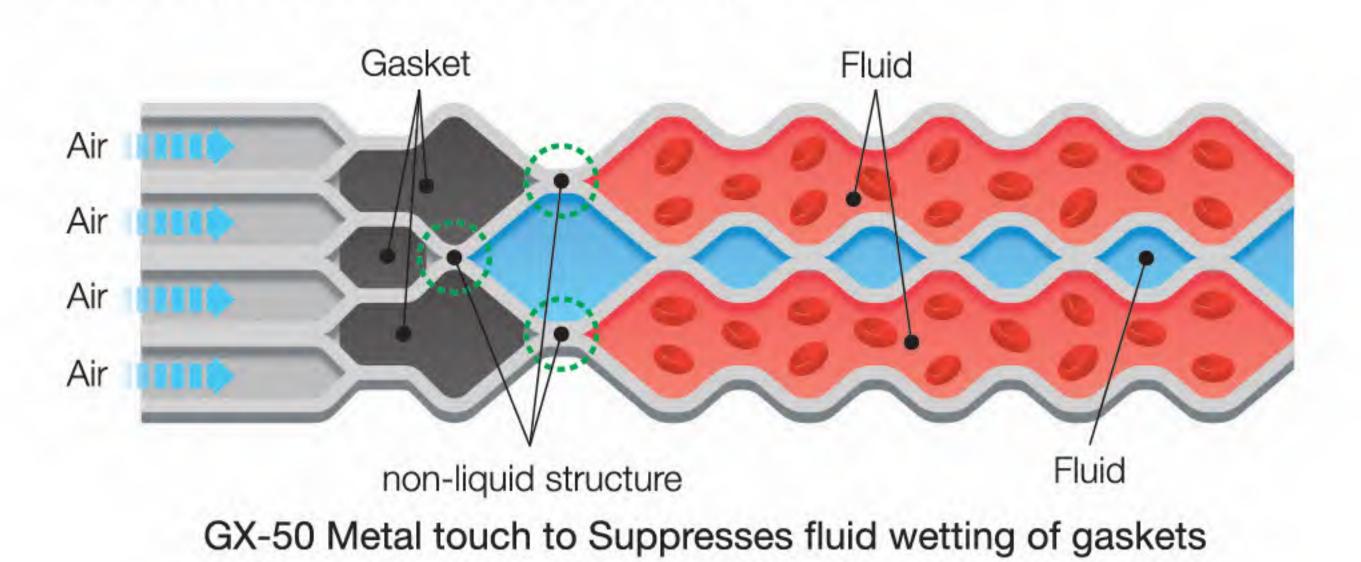
- * The Hestia NX-50 was developed jointly with Hitachi-GE Nuclear Energy, Ltd.
- * Patent pending

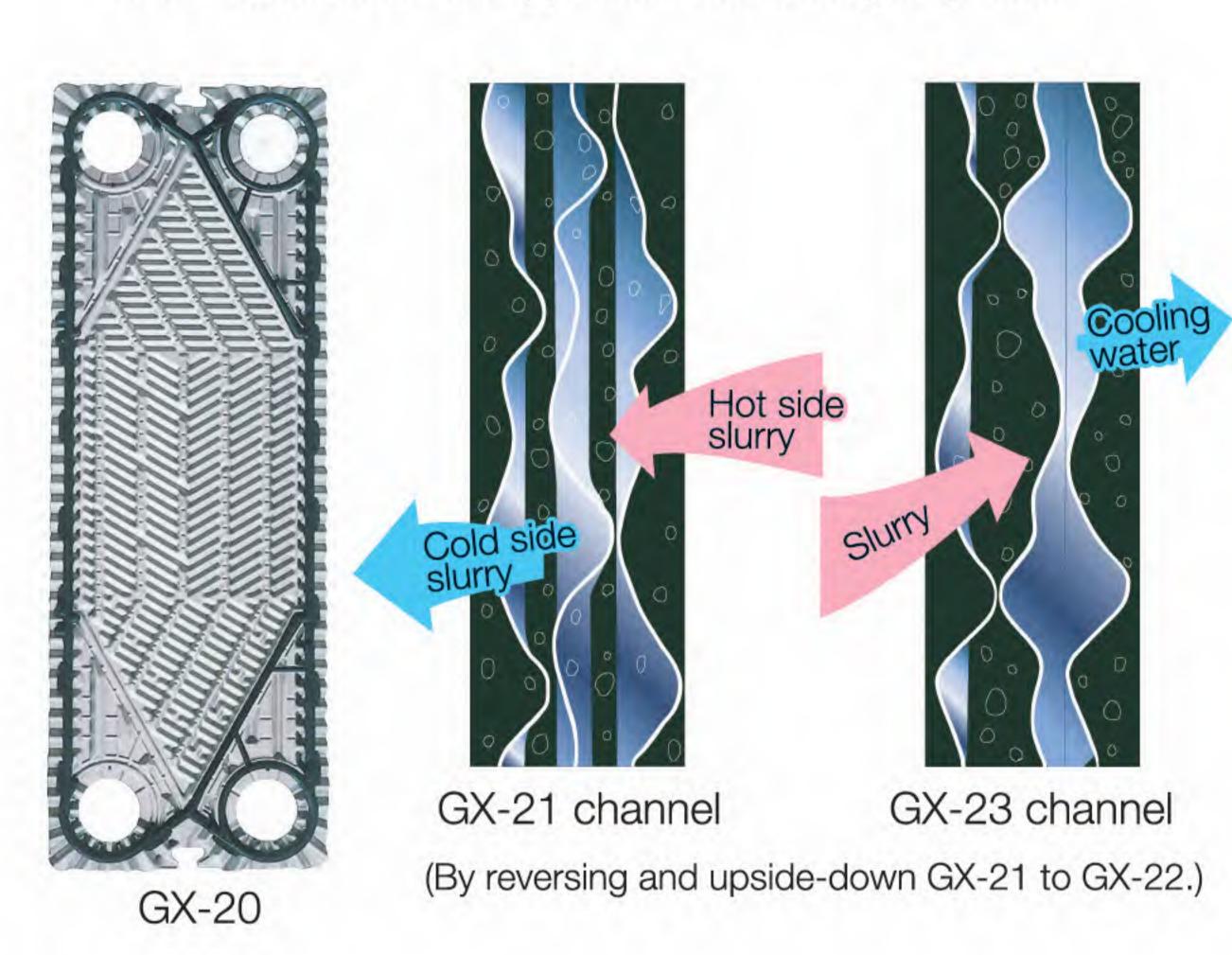
Cooling Water Side

Plate Heat Exchanger Lineup

Multi Gap Plate **EXOLUTION(GX)**

Clearing away clogging concerns and taking on the challenge of new heat recovery areas



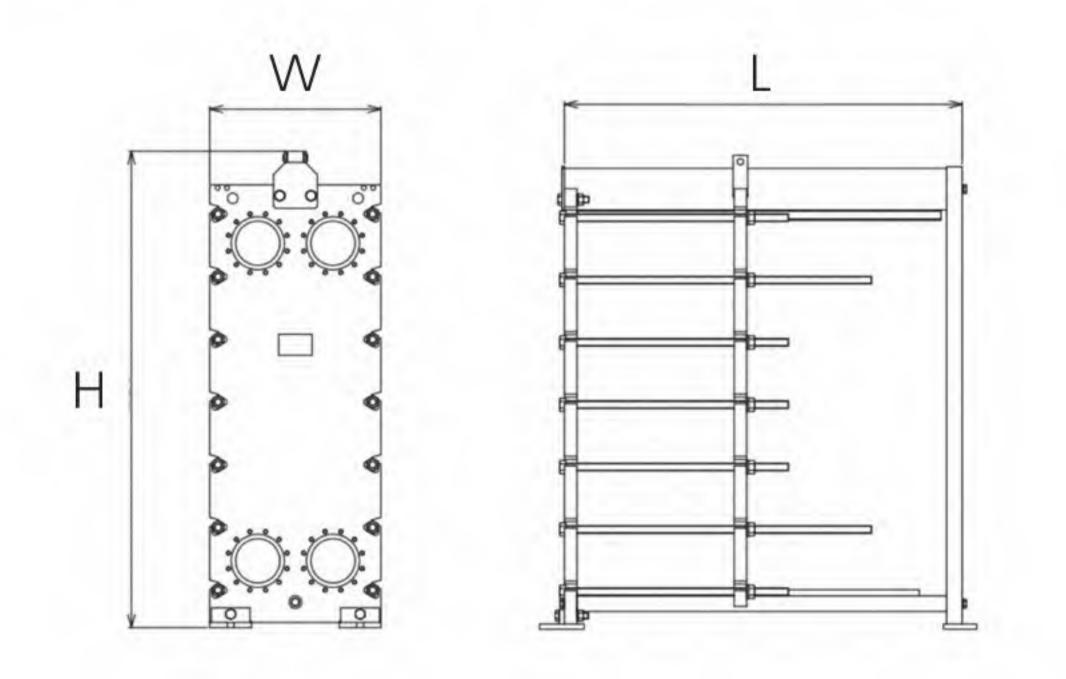


Characteristics

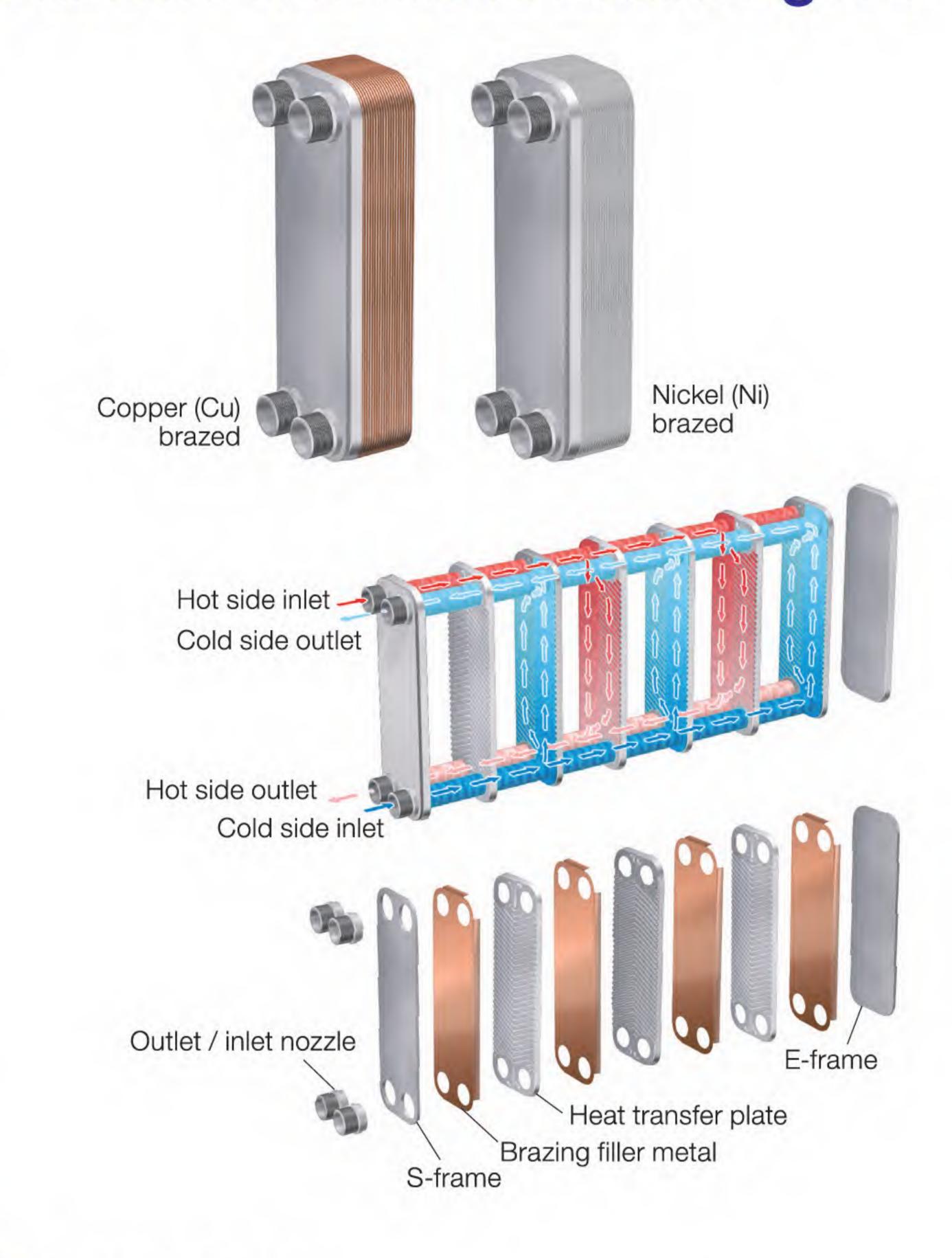
- 1 Smooth, stress-free flow for fluids containing solids.
- 2 The maximum gap is 20 mm for the GX-20 and 16 mm for the GX-50, which expands the range of applications for fluids containing solids.
- 3 GX-20 can be configured with three different flow gaps using a single plate combination, allowing the user to select the appropriate flow gap for the fluid.
- 49 GX-50 is also suited to increasing the service life of gaskets by reducing wetting of the gasket to almost zero.
- 5 Economical design is possible for specifications for the replacement of Shell & Tube heat exchangers with flow differences.

Scope of application for GX-50

Plate Material	SUS316、SU316L、TP270、NW2200、HC276				
Gasket Material	NBR、EPDM、FPM				
Maximum design temperature	130°C				
Maximum design pressure	1.2MPaG				
Equipment size (reference)	L913~4913×W820×H2281				



Brazed Plate Heat Exchangers



Characteristics

- Brazed plate heat exchangers are brazed stainless steel plates by brazing filler metal such as copper or nickel.
- 2 It is high performance and allows for a small heat transfer area. 3 Due to the small heat transfer area and the thin material by
- sturdy brazed structure, light weight, and compact design are achieved.
- 4 With brazed structure, it provides a high level of sealing and outstanding heat and pressure resistance.
- 5 The brazed structure reduced material to minimum is fit for mass production and is economically outstanding.

Applications

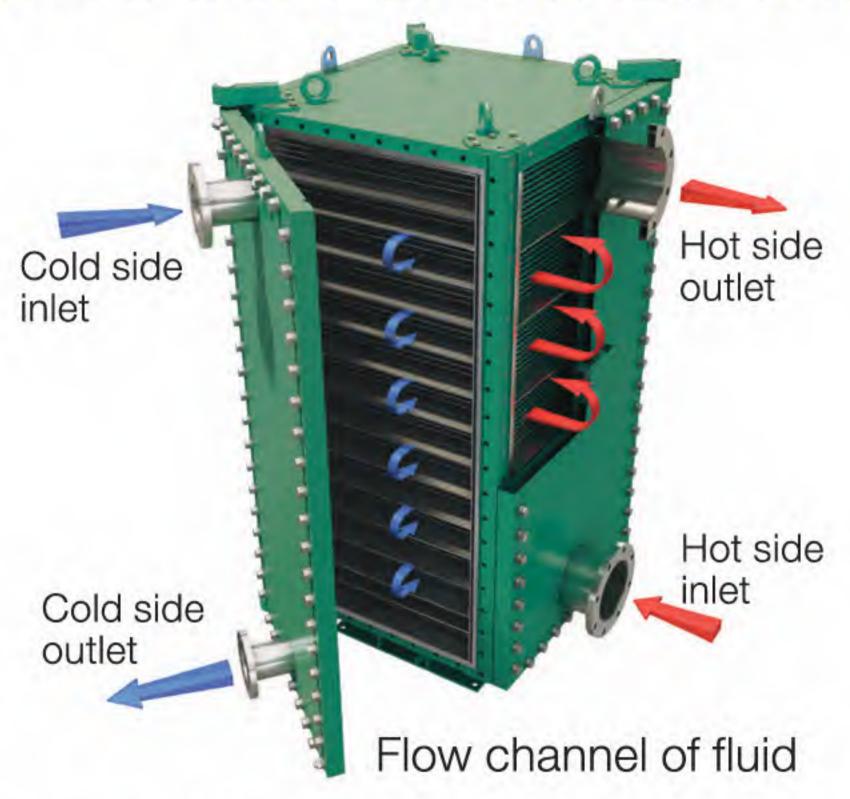
- 1 Vaporizers / condensers of refrigerant in compression refrigeration cycles (refrigerators / heat pumps)
- 2 Solution heat exchangers for absorption refrigerators
- 3 Industrial and home water heaters
- 4 Heat recovery heat exchangers for cogeneration systems or gas heat pumps
- 5 Oil coolers for hydraulic equipment
- 6 Heat exchangers for temparature control of various industrial equipment and medical examinations

Specification

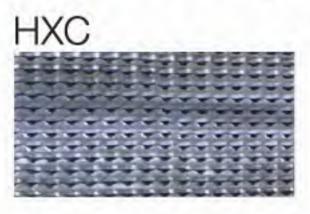
Design pressure: F.V. to 4.5 MPa Design temperature: -100°C to 200°C

The above mentioned varies by model. Please inquire with our company when planning.

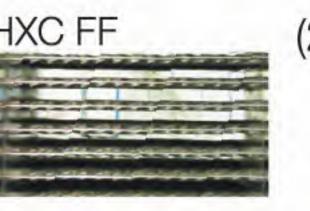
Welded Plate Heat Exchangers : General Ball Valve (HF5)



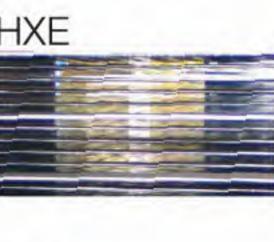
Variety of plate gap



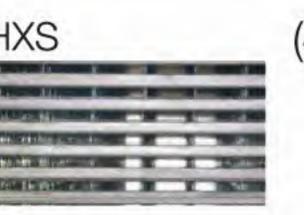
(1) Both sides lightly charged fluid Both sides corrugated channel.



(2) One charged fluid HXC Free Flow (FF) FF corrugated / corrugated channel.



(3) One side highly charged fluid FF / Dimpled channel.



(4) Both sides dirty fluids

Both side rectangular FF channel with studs.

*Free Flow: Wide gap and no contact point between the heat transfer plates

Characteristics

- 1 The press-molded plate is molded with a special corrugation pattern to ensure a high transfer coefficient.
- 2 It supports high temperatures and high pressures, showing its performance in a wide range of fields.
- 3 The seal gasket consists only of the side cover, so there are virtually no restrictions due to gasket materials.
- 4 As baffles can be installed to enable a multi-pass design, heat transfer performance is close to a counter-current flow, and has a flexible flow rate.
- 5 As the holding volume is small, the amount of fluid remaining in the unit is also small and only a small amount of CIP detergent can be used.
- 6 Easy mechanical cleaning by the cross flow channel structure.

Applications

- 1 Heat transfer process for higher efficiency than Shell & Tube heat exchangers
- 2 Heat recovery in high temperature / high pressure applications
- 3 Condensers
- 4 Vaporizers
- 5 Heat transfer process where a Gasketed PHE cannot be used They are also able to replace Shell & Tube heat exchangers in

other cases as well.

Specification

Max. working pressure	3.5 [MPaG]
Max. working temperature	Up to 350 [°C]
Connection size	50A to 600A
Max. heat transfer area	Up to 700 m²/unit
Plate material	Stainless steel, titanium, high nickel alloy

^{*} The above mentioned varies depending on the operating conditions. Please inquire with our company when planning.

Ball Valve Line Up



Characteristics

- Floating type general ball valve is a representative model of the valves manufactured by HISAKA.
- 2 Support various options for this product, including oil & water free treatment, buffing and others.
- 3 The valve can also be automated without disassembly while still on the piping.
- 4 For the valve cleaning level, even standard cleaning is equal or superior to simplified oil free treatment compare with other makers.

Specification/Pressure Class/Size inch (mm)

Port	Full Bore
JIS10K ASME CLASS150	1/2"(15A)-12"(300A)
JIS20K ASME CLASS300	1/2"(15A)-10"(250A)
ASME CLASS600	
Maximum Temperature	260°C (For standard seal material)
Connection	Flange
Face-to-Face	ASME B16.10
Allowable Seat Leakage Volume	No leakage

Material

Body	Stainless steel, Carbon steel, Cast iron, Ductile cast iron, (*) Special materials can be used, including Hastelloy, Nickle and Titanium	
Trim	Stainless steel, (*)Special materials can be used,including Hastelloy,Nickle and Titanium	
Seat	PTFE, Maxtite PTFE,Carbon-fiber reinforced PTFE PEEK (Poly Ether Ether Ketone BR (with back seat)	

Tank Bottom Ball Valve (TB5) Jacketed Ball Valve (HJ5)



Characteristics

- 1 This ball valve is developed for tank bottoms and is much superior in discharging efficiency, agitation performance, and operability to the flush valve, and gate valve, which are conventionally used.
- 2 Actuator possition can be changes by link type equipment.

Specification/Pressure Class/Size inch (mm)

podification, recoding diago, died internation,				
Port	Full Bore			
JIS10K ASME CLASS150	1"(25A)-12"(300A)			
JIS20K ASME CLASS300				
ASME CLASS600	-			
Maximum Temperature	260°C (For standard seal material)			
Connection	Flange			
Face-to-Face	Manufacturer standard			
Allowable Seat Leakage Volume	No leakage			

Material

Body	Stainless steel, Hastelloy alloy Stainless steel, Hastelloy alloy	
Trim		
Seat	PTFE, Maxtite PTFE, Carbon-fiber reinforced PTFE,Metal seat	



Characteristics

- This jacketed ball valve is used for temperature control line.
- With full bore design, this valve has high liquidity performance.
- 3 This jacketed ball valve uses a long bonnet at its gland part to protect thermal effect.

Specification/Pressure Class/Size inch (mm)

Port	Full Bore	
JIS10K ASME CLASS150	1/2"(15A)-12"(300A)	
JIS20K ASME CLASS300	1/2"(15A)-8"(200A)	
ASME CLASS600	<u>-</u>	
Maximum Temperature	260°C (For standard seal material)	
Connection	Flange	
Face-to-Face	ASME B16.10	
Allowable Seat Leakage Volume	No leakage	

Material

Body	Stainless steel		
Trim	Stainless steel		
Seat	Maxtite PTFE, PTFE, Carbon-fiber reinforced PTFE, Carbon seat, Metal seat		

Maintenance Menu

PHE Total Maintenance [Full Service Package] from pickup to assembly

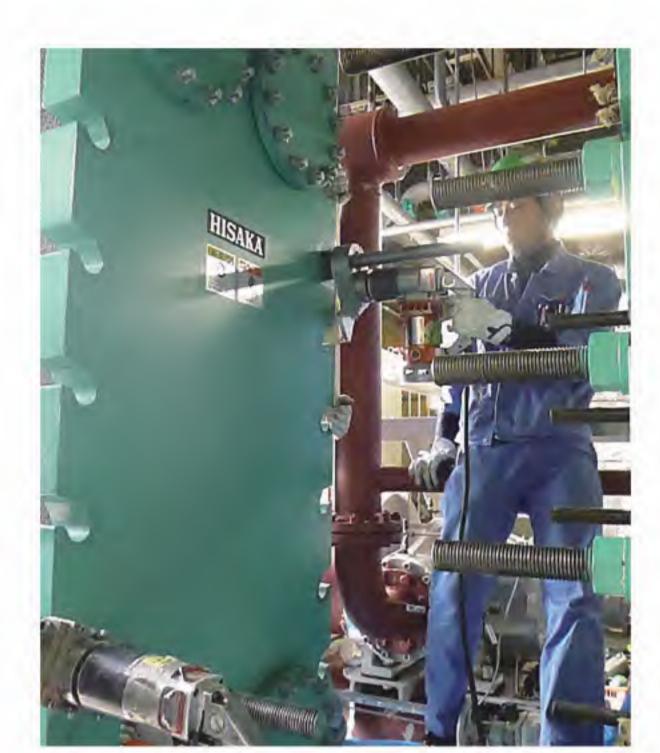
The Full Service Package is a total maintenance service in HISAKA. PHE disassembly, visual checks of plates, cleaning, regasketing, frame repairs, assembly, and final inspection are all performed by service centers, for the best possible performance and a long operating life time for PHEs.

We also offer the "Full Service Package" for plates only.

Return Containers for "Full Service Package" for plate only (Optional)



Return containers that precisely fit the plates that are currently in use are provided upon customers' request.



On-site Maintenance

HISAKA can send skilled service engineers to perform maintenance work at the customer's site. We use specialized tools, such as automatic tightening devices, to efficiently dissemble and assemble the PHE and high temperature hot water jet cleaning to remove to sticky oil residues, providing high quality maintenance service at the customer's site.

Cleaning In Place (CIP)

Disassembly and cleaning a PHE makes it possible to remove hard scale and clogging matters and to recover performance to nearly the same level as new. However, if disassembly and cleaning are not possible, HISAKA offers CIP using "Plate-Clean" at customers' site. Before scaling, CIP with Plate-Clean can restore performance by removing scale through washing and dissolving. This is effective in prolonging the disassembly cleaning cycle of the PHE. This is effective for extending the disassembly cleaning cycle of plate heat exchangers.

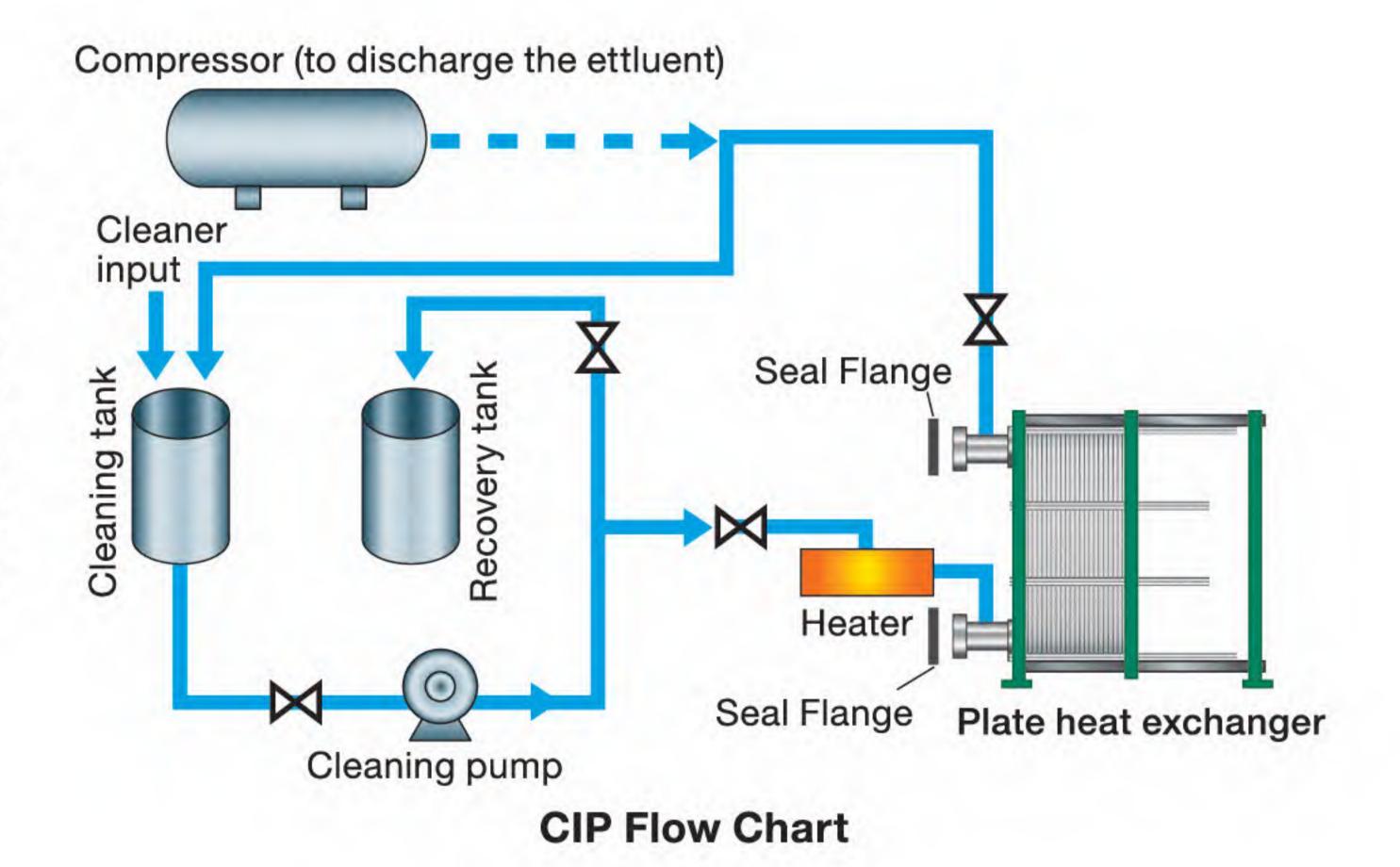


Plate-Clean

Plate-Clean is a special cleaner for PHEs. By circulating the cleaner inside the PHE, stubborn scale that forms on the cooling water, warm water, and steam sides can be easily removed by cleaning and dissolving without

disassembling the unit. Customers are no longer required to perform the hard work of removing scale.

Cleaner and Target Scale

Cleaner and	Target Scale	
	Product Name	Target Scale
Cleaner	Plate-Clean C	Calcium corbonate
	Plate-Clean S	Slime, mud
	Plate-Clean F	Iron rust

Plate-Clean Series







* Each type of Plate-Clean is also sold separately.

A reliable solution for Sea water Application delivered by professional manufacturer of plate heat exchangers.

When sea water is utilized with plate heat exchanger, the adherence of marine organisms, algae, shellfish, and dust in sea water into the plate heat exchanger and cause clogging, increased pressure drop, decreased flow rate, and insufficient performance. Therefore, stable long-term operation of plate heat exchangers can be achieved by taking anti-fouling measures to prevent adhesion of marine organisms and anti-debris measures to prevent clogging due to foreign materials in sea water.

Anti-debris measures Hi-TORNENDE

Strainer provided by plate heat exchanger manufacturers

HAS series Automatic back-flushing type strainer Automatic back-flushing mechanism that switches the sea water flow direction in the strainer element and discharges foreign materials



Click here to check the movie



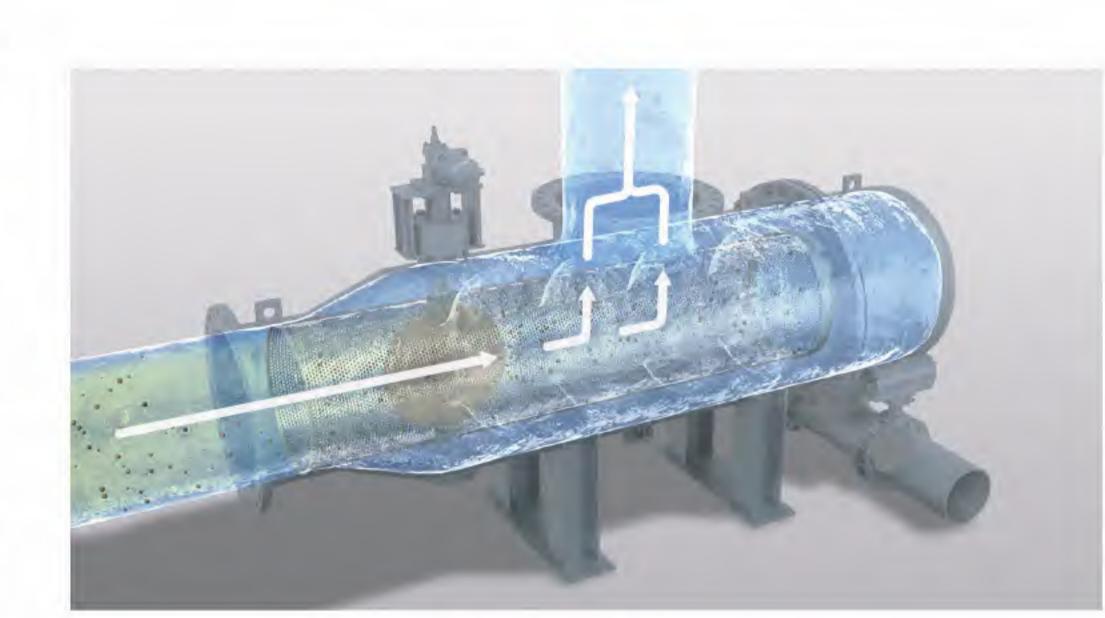
Structure

Punching metal elements remove foreign materials such as algae, shellfish, and dust in sea water.

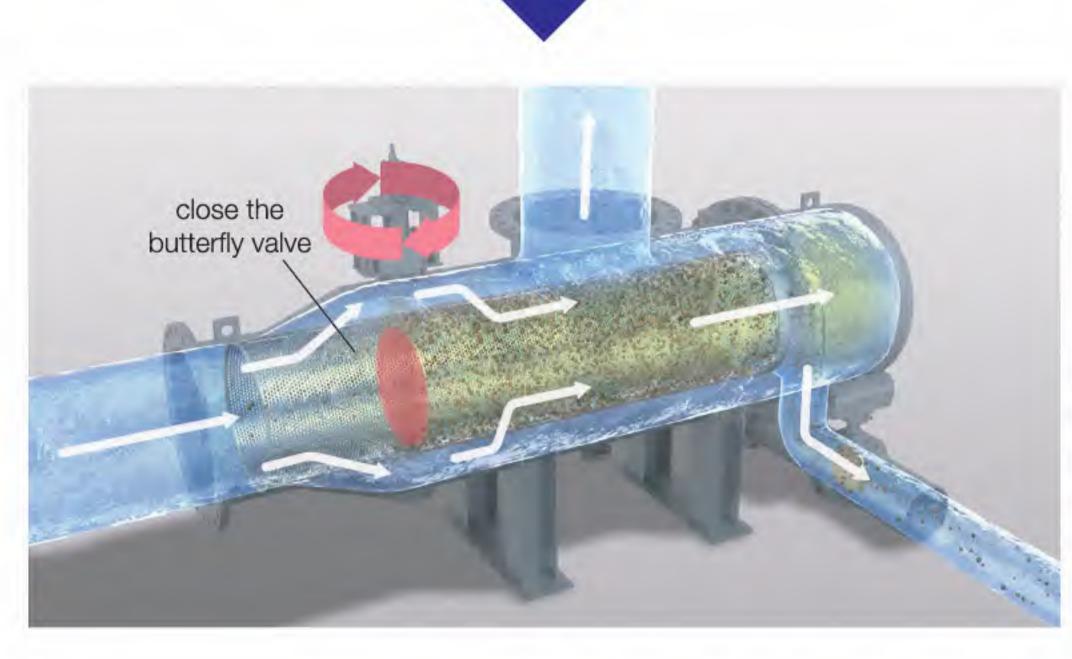
By switching the sea water flow direction in the element with a butterfly valve, foreign materials in the sea water accumulated in the element are discharged by back-flushing.

Features

- Use of cylindrical punching metal allows a lager filtration area.
- 2 Back-flushing is automatically performed using the differential pressure and timer setting.
- 3 Back-flushing requires 10% of the flow rate of sea water required for normal operation, allowing back-flushing to be performed during normal operation.
- 4 The element can be opened and cleaned without removing the main pipe during maintenance.



Foreign materials in sea water are removed by the element, and the filtered sea water flows out from inside to outside of element and is delivered to the plate heat exchanger.



Subsequently, the internal butterfly valve closes, removing foreign materials accumulated in the element from the outside to the inside.

HCS series Cyclone type strainer

A self-ejection mechanism, foreign materials are discharged only by opening the discharge valve



Click here to check



Structure

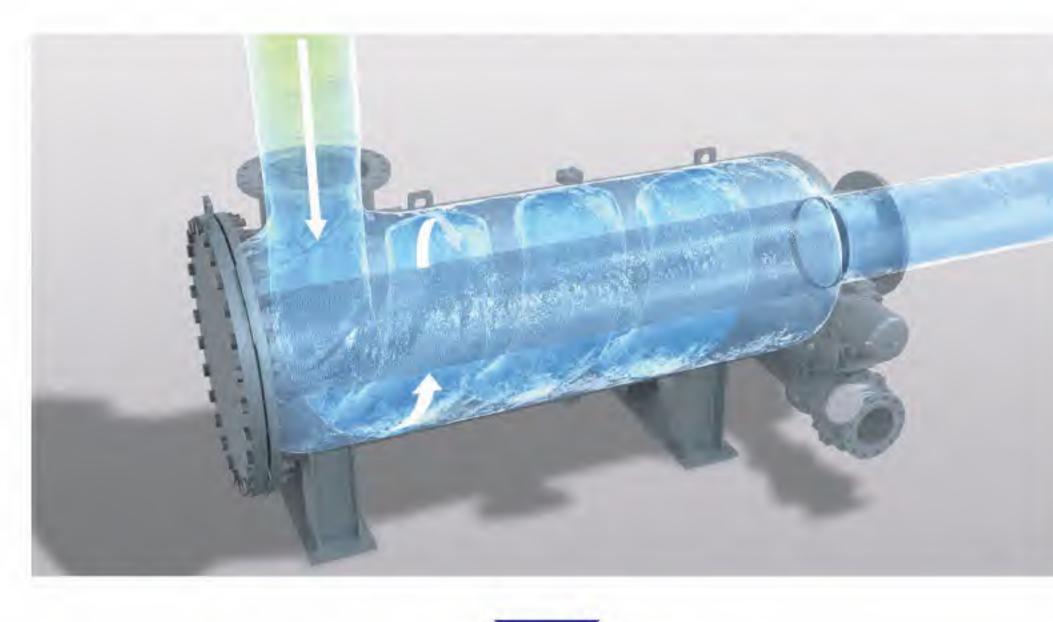
By sea water is flown from the contact direction of the shell body, a cyclone flow is generated outside the punching metal element, and foreign materials in sea water are removed by centrifugal force.

Foreign materials accumulated in the shell are discharged by opening the discharge

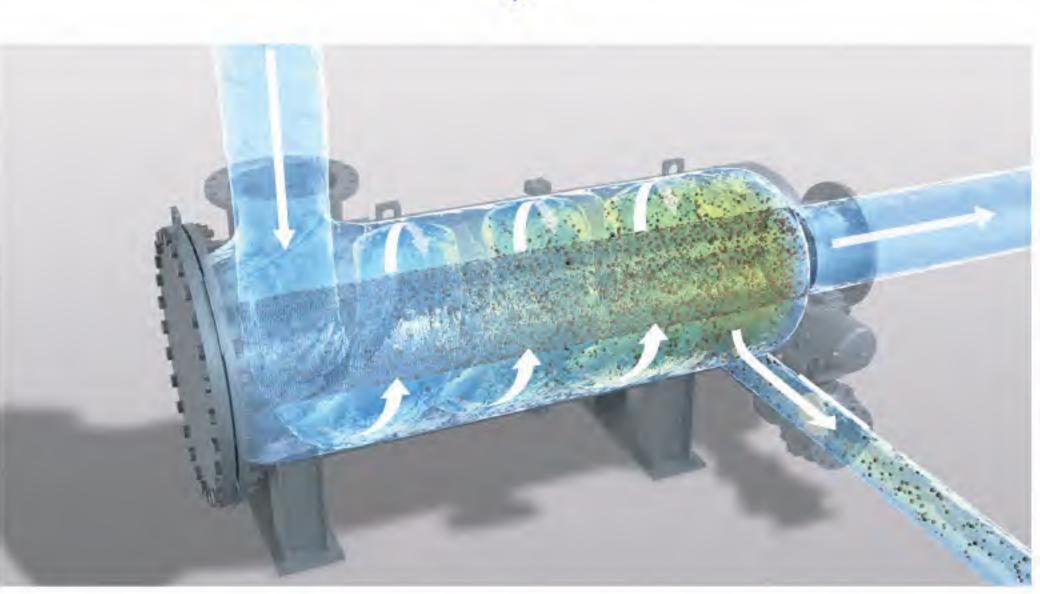
Approximately 10% of the total flow rate can be discharged at all times and it can be improved the operating performance of discharging foreign materials.

Features

- Use of cylindrical punching metal allows a lager filtration area.
- Ocyclone flow reduces adhesion of foreign materials on the element due to its self-cleaning effect.
- 3 Since the drive unit is only the discharge valve, the risk of drive failure du to damage or foreign materials adherence is reduced.
- 4 The element can be opened and cleaned without removing the main pipe during maintenance.



Sea water containing foreign materials flows into the strainer and swirling the outside of the element.



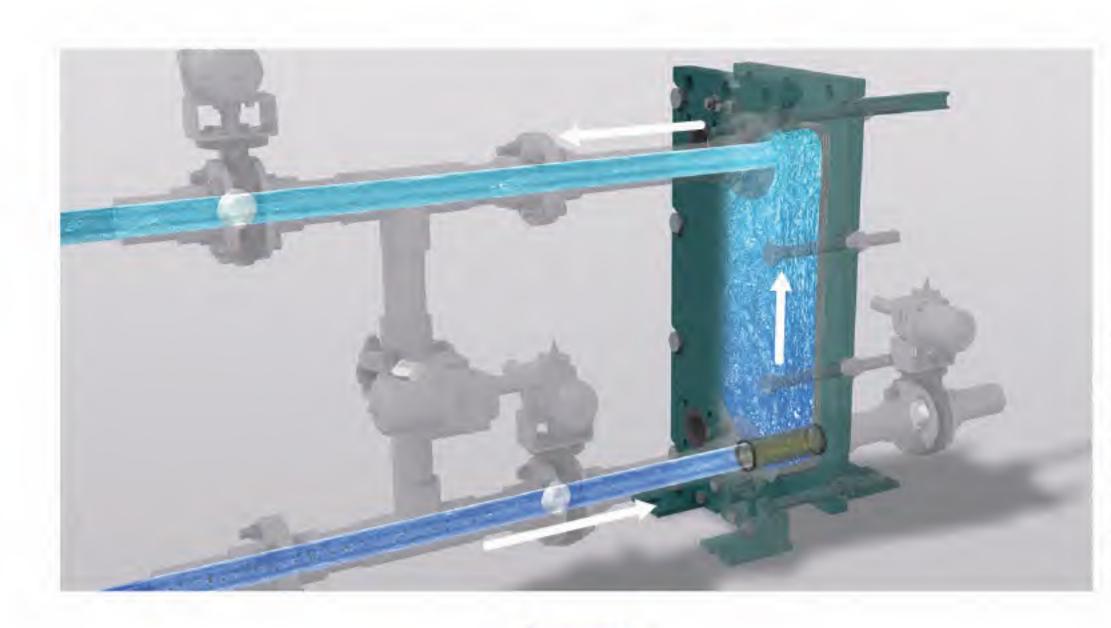
Foreign materials have been swirling inside are to be discharged from discharge port together with some sea water

HRS

HISAKA Automatic Back-flushing Blow System

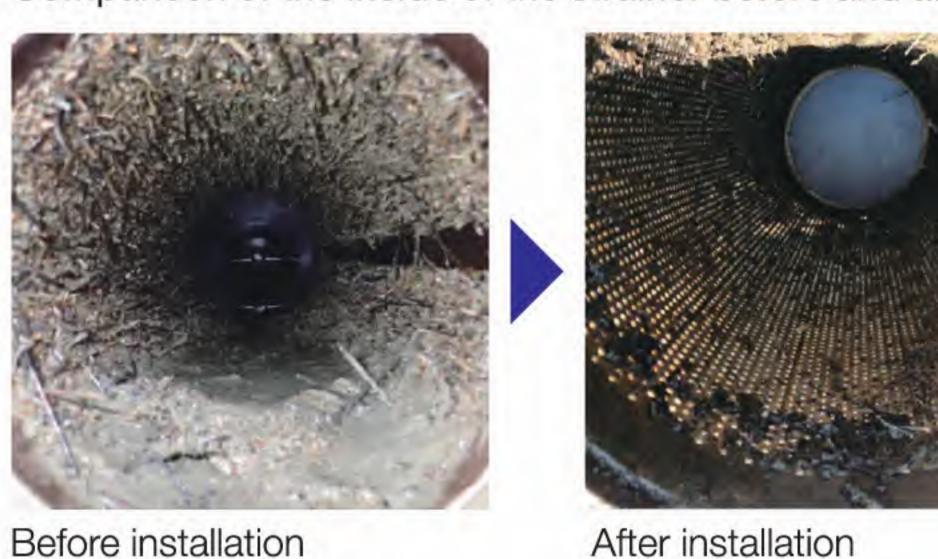
Foreign materials inside the inner strainer are removed by switching the valve.

By inserting an inner strainer into the port hole of the plate heat exchanger, foreign materials such as sea water dust and algae is removed. During operation of the plate heat exchanger, the sea water inlet and outlet are reversed by operating the valve to reverse the normal sea water flow, thereby blowing out foreign materials accumulated in the inner strainer.



The inner strainer inserted in the port hole of the plate heat exchanger removes dust and foreign materials in sea water.

Comparison of the inside of the strainer before and after installing HRS



to check

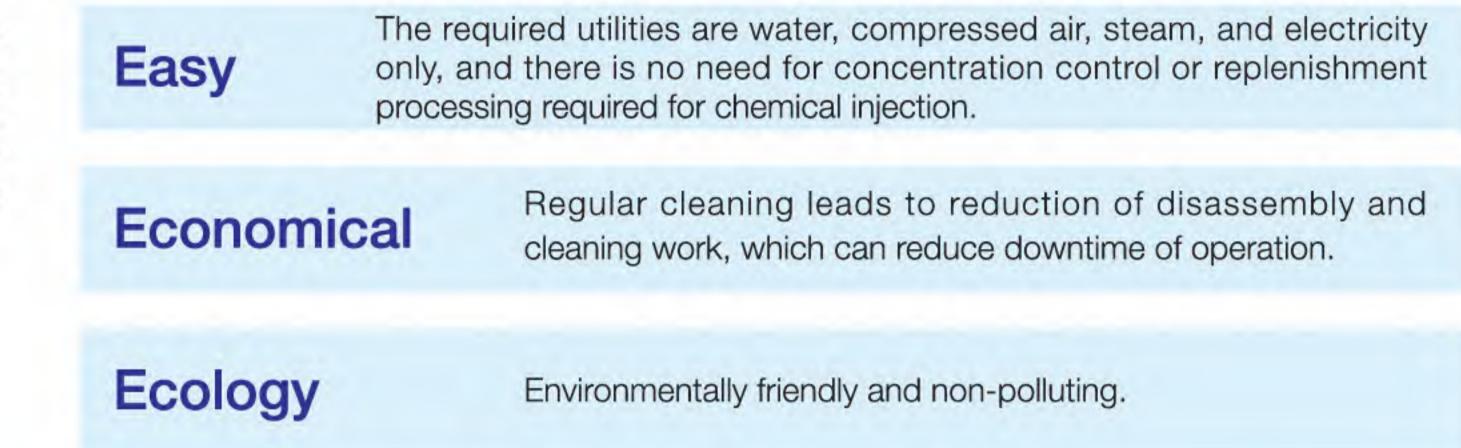


Click here

Foreign materials in the inner strainer are discharged by switching the valve to switch the normal flow to the back-flushing flow.

Anti-fouling measures | Hot Water Circulation System

Fungi and juvenile shells are killed when the environmental temperature rises due to the circulation of hot water, and even mussels, which are highly heat-resistant, are killed in 10 minutes at 45°C and in a few seconds at 50°C. Using this effect, 60°C hot water is kept in the plate heat exchanger for a certain period of time to prevent fouling by marine organisms.

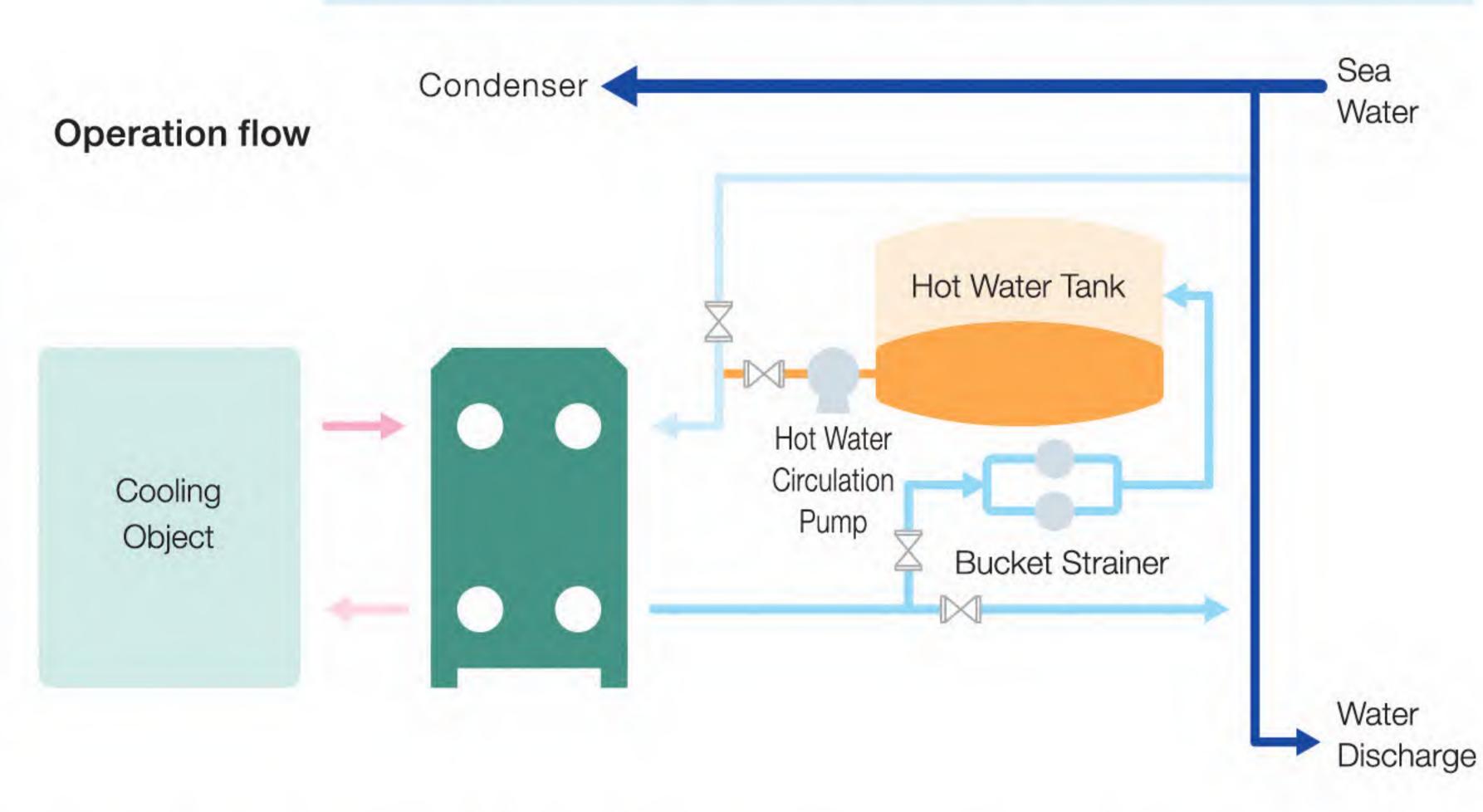


Features

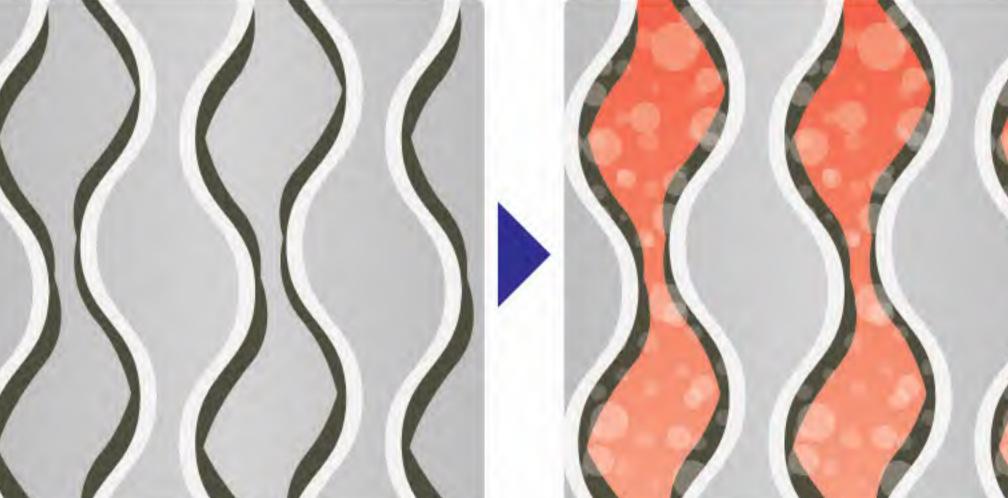
This is an environmentally friendly and pollution-free antifouling treatment, as no chemicals are used, eliminating the need for chemical control.



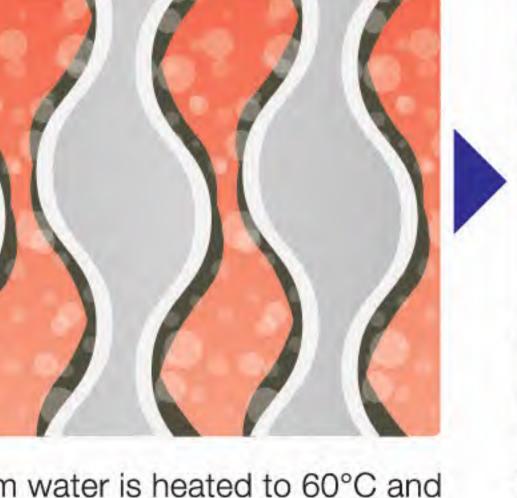
Hot Water Circulation System







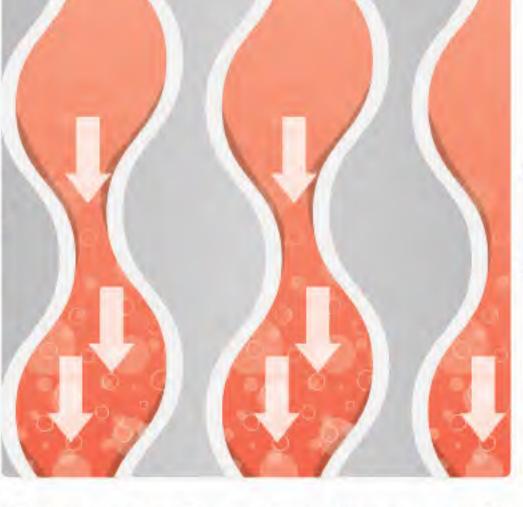
Seawater is discharged after the operation is stopped.



Warm water is heated to 60°C and circulated for 60 minutes to kill marine organisms such as fungi and juvenile shellfish.



Bubbling floats attached marine organisms up to the surface.



The contaminated warm water in the vessel is discharged.



Seawater is returned to the vessel and operation is restored.

Plate Heat Exchangers Used in Various Applications

Chemicals



Soda, fertilizer, petrochemistry, petroleum refining, oil and fat, chemicals, general inorganic / organic chemical industry, etc.

HVAC



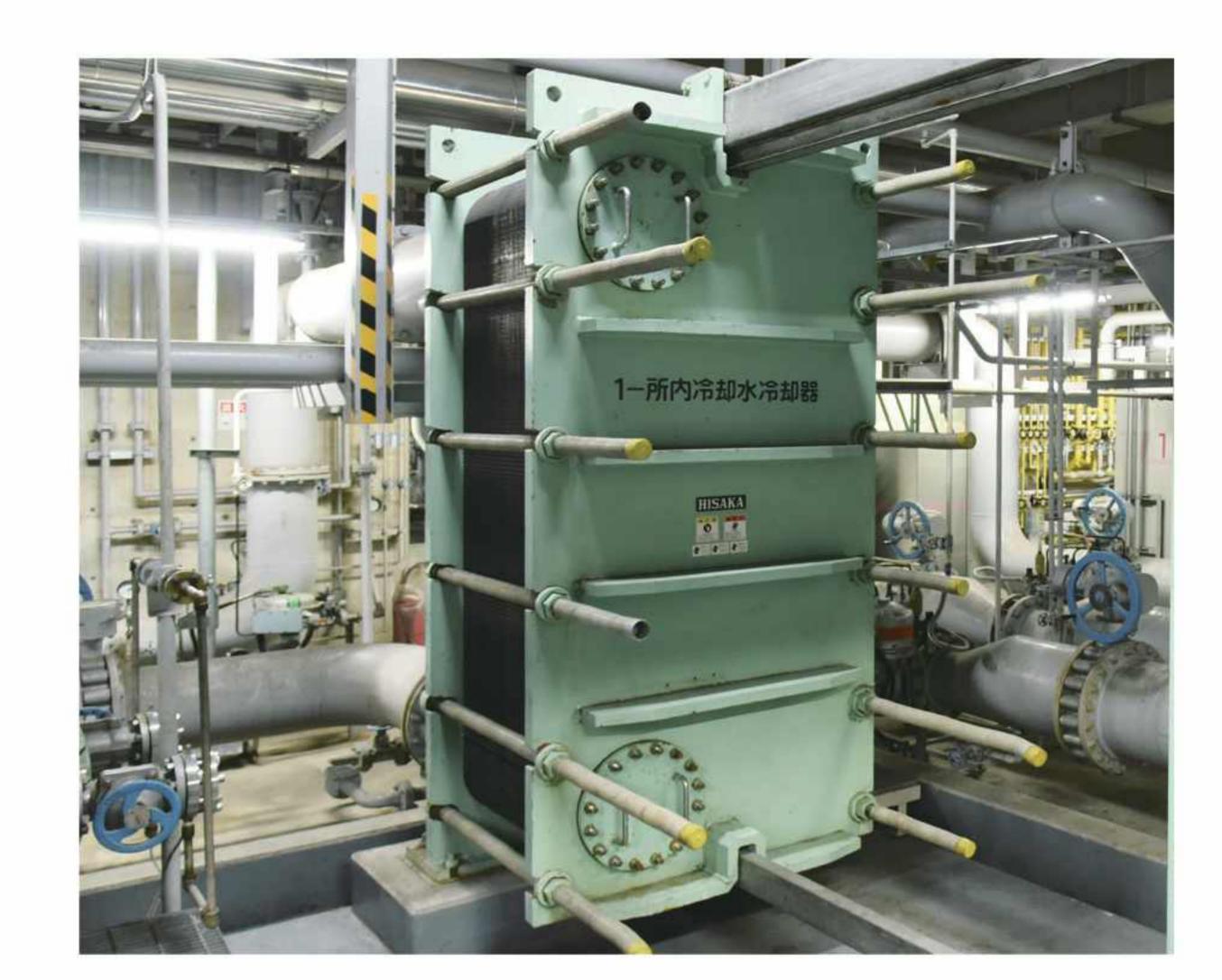
Heating / cooling system, water heating, district heating / cooling, building heat storage tank systems, unused energy

Marine



Cooling of engine jacket water and lubricant oil

Electric Power



Generators, cogeneration

Gas Treatment



CO2 recovery, desulfurization plant solution heat exchange

Metal and Mining



Sulfuric acid, electrolytic plating cooling

Environment



Solvent recovery, exhaust gas cooling

Central Cooling



Central cooling system

Iron and Steel



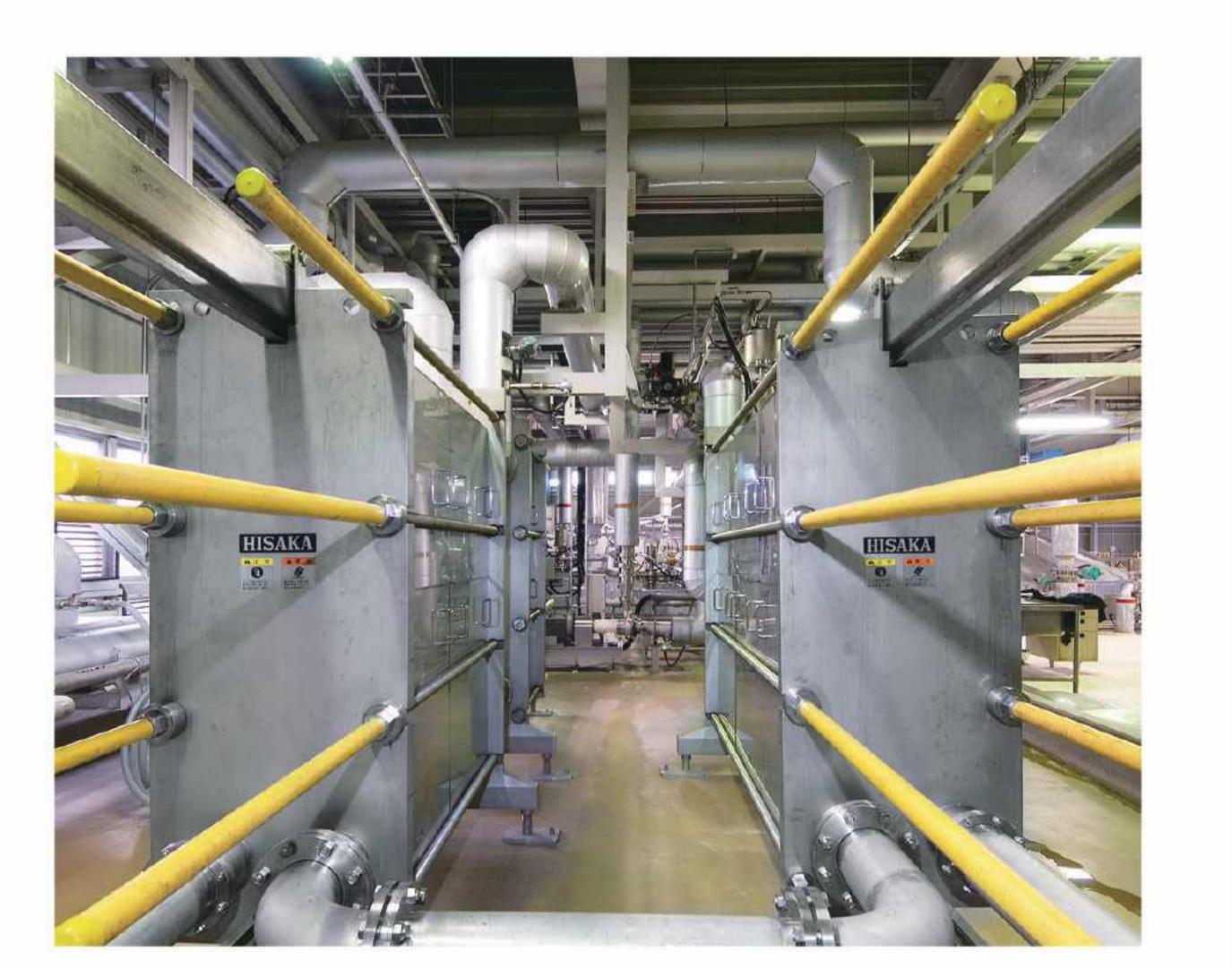
Blast furnace cooling, continuous casting equipment cooling, COG, various plating fluid cooling

Pulp & Paper



Heat exchange of black liquor / white water, oven blow gas condensation, waste heat recovery

Food



Beer, edible oil, sodium glutamate

Fermentation and Distillation



Brewing, alcohol fermentation process such as for bioethanol

HISAKA Group

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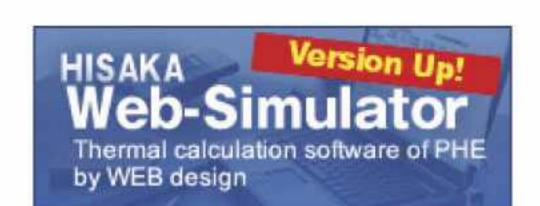
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HISAKA Web-Simulator (HWS)

This is the first plate heat exchanger design website opened on the Internet in the world. Access the URL below and click on the Web-Simulator icon.



You can simulate the plate heat exchanger perfect for your needs, any time of the day, from anywhere.

https://www.hisaka.co.jp/simulator_english/

Quotation Request by FAX

Malaysia Fax :+60 3 8081 7185

If necessary to help for selection of Plate Heat Exchanger, please fax the form below to us.

1. Heat duty	kW	
	Hot side	Cold side
2. Fluid name		
3. Inlet temperature	°C	°C
4. Outlet temperature	°C	°C
5. Flow rate	m³/h	m³/h
6. Pressure loss	MPa or less	MPa or less
7. Maximum working pressure	MPaG	MPaG
8. Special notes Plate materials, gasket materials, etc.		

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