

## Swimming Pool Heat Exchangers



We have a variety of shell and tube heat exchangers for solar pool heating systems or boiler pool heating systems. To promote longevity of all the system components, instead of placing chlorine or salt pool water directly through the solar panels, utilize an external swimming pool heat exchanger for a more versatile, robust solar design.

Our swimming pool heat exchangers are designed by our special innovative tube designs, spiral twisted corrugation on the tubing surface, which were engineered to maximize the use of solar or boiler energy; thus increasing the overall thermal efficiency of the system.

With a wide range of sizes, and a selection of different materials to suit the specific requirements, these popular swimming pool models are the perfect solution for any pool, spa, and hot tub application.

Alfa swimming pool Heat Exchanger is fully constructed with pressurized shell and spiral corrugated inner tube. This ensures high velocities inside the unit making swimming pool heat exchanger a very reliable, efficient and cost effective way to transfer heat indirectly between any hot water circuit, steam circuit and any pool or spa circuit, besides other application.

We have a large range of heat exchangers well suited from small spas up to Olympic size pools, our units are rated from 55,000 to up to 5,000,000 BTU/H

### Features:

With high heat transferring efficient heat exchanger tubes and smooth shell, it ensures high velocities inside of the unit making the heat exchanger a very reliable, efficient and cost effective way to transfer heat indirectly between any boiler or solar heating circuit and any pool or spa circuit, besides other applications.



## Swimming Pool Heat Exchangers

### Advantages:

- I High efficiency , coefficient up to 10000 W/m<sup>2</sup>· ° C , Heat exchanging capacity 3-7 times traditional equipments.
- I Compact configure, occupy small area, one tenth as the traditional equipments.
- I Stainless steel and/or titanium material, endure high temperature, pressure and corrosion.
- I Helix screw thread elasticity heat exchange bundle, eliminate the stress.
- I Design flux speed is 5.5m/s, less dirt.
- I ASME standard VIII-1
- I Big flow volume
- I Compactable
- I Easy installation and durable.

Design Parameters	TUBES	SHELL
TEMPERATURE	406°F (208°C)	406°F (208°C)
PRESSURE	190 PSI (1.31MPa)	190 PSI (1.31MPa)

Standard Materials	SS Series	T Series
Shell	SS316L	Titanium
Tubes	SS316L	Titanium
Connections	SS304	Titanium

**Note: Please check your working temperature and chlorine concentration for material type used.**

### Swimming Pool Heat Exchangers Nominal Performance

Model	Normal Capacity		Shell (pool) side	Tube (Hot) side	Swimming Pool Capacity	
	kW	kBtu/Hr			m3	USGAL
SP-55	16	55	1"	3/4"	15	3960
SP-85	25	85	1"	3/4"	22	6600
SP-155	45	155	1 1/2"	1"	40	11900
SP-210	60	210	1 1/2"	1 1/2"	65	17200
SP-300	88	300	1 1/2"	1 1/2"	90	23800
SP-360	105	360	2"	1 1/2"	110	29000
SP-600	175	600	2 1/2"	2"	180	47500
SP-1200	352	1200	2 1/2"	2"	360	95100
SP-2400	704	2400	4"	2"	720	190200
SP-3000	880	3000	4"	2 1/2"	900	237700
SP-3600	1056	3600	4"	2 1/2"	1080	285300
SP-4500	1310	4500	4"	2 1/2"	1350	356600
SP-5000	1460	5000	4"	2 1/2"	1500	396200
SP-6000	1760	6000	4"	2 1/2"	1800	475500

## Swimming Pool Heat Exchangers

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### Note:

1. For occasional (holidays & weekends) use pools we recommend a 2x output multiplier to obtain a 2°F/hr heat up rate;
2. Nominal values are based on 60°C temperature between incoming heating and heated water.
3. Other Fluids Correction Factors;

Fluid	Factor
Water	100%
Ethylene Glycol 30%	92%
Ethylene Glycol 50%	85%
Propylene Glycol 30%	94%
Propylene Glycol 50%	89%
Oil SAE10	50%
Oil ISO VG22	45%

### Stainless Steel and Titanium Corrosion Resistance Table

Chlorine Concentration	Working Temperature			
	60°C	80°C	120°C	130°C
equal 10ppm	304	304	304	316L
equal 25ppm	304	304	316L	316L
equal 50ppm	304	316L	316L	Ti
equal 80ppm	316L	316L	316L	Ti
equal 150ppm	316L	316L	Ti	Ti
equal 300ppm	316L	Ti	Ti	Ti
300ppm more	Ti	Ti	Ti	Ti

### Typical residential application:

In-floor heating  
 Swimming pools, spas heating  
 Domestic hot water heating  
 Solar Hot Water Heating  
 Outdoor Wood Furnances  
 Hot tube heating  
 Driveway snowmelts

### Typical industrial application:

Oil cooler or heating  
 Steam condenser  
 District/central heating  
 Transmission and engine cooler  
 Boiler sample cooler  
 Waste water heat recovery  
 Industry process

## Titanium Shell and Tube Heat Exchanger

Titanium Shell and Tube Heat Exchangers are suited for a vast range of chemical environments and conditions, due to a thin, invisible, but extremely protective, surface oxide film (primarily  $TiO_2$ ). Titanium is especially known for its elevated resistance to localized attack and stress corrosion in aqueous chlorides (e.g., brines, seawater) and other halides and wet halogens (e.g., wet  $Cl^2$  or  $Cl^{2-}$  sat, brines), and to hot, highly-oxidizing, acidic solutions (e.g.,  $FeCl_3$  and nitric acid solutions). Titanium is also recognized for its superior resistance to erosion, erosion-corrosion, cavitations, and impingement in flowing, turbulent fluids.

Alfa Titanium Shell and Tube Heat Exchanger is fully constructed with pressurized shell and spiral corrugated or smooth inner tube. This ensures high velocities inside the unit making titanium shell and tube heat exchanger a very reliable, efficient and cost effective way on the heating, cooling, condensing or evaporation and so on.

### Features:

With high heat transferring efficient heat exchanger tubes and smooth shell, it ensures high velocities inside of the unit making the heat exchanger a very reliable, efficient and cost effective way to transfer heat indirectly between hot circuit and cold circuit.

Alfa Titanium Shell and Tube Heat exchangers are fully welded construction. It can endure high working pressure. It avoids the replacement for gasket and saved more time and cost on maintain or clean.

### Advantages:

- I High efficiency , coefficient up to  $10000 \text{ W/m}^2 \cdot ^\circ \text{C}$  , Heat exchanging capacity 3-7 times traditional equipments.
- I Compact configure, occupy small area, one tenth as the traditional equipments.█
- I Titanium material, endure high temperature, pressure and corruption.
- I Helix screw thread elasticity heat exchange bundle, eliminate the stress.
- I Design flux speed is 5.5m/s, less dirt.
- I ASME standard VIII-1
- I Easy clean and maintain
- I Big flow volume
- I Compactable
- I Easy installation and durable.



Design Parameters	TUBES	SHELL
TEMPERATURE	406°F (208°C)	406°F (208°C)
PRESSURE 1	650 PSI (4.50MPa)	190 PSI (1.31MPa)
PRESSURE 2	650 PSI (4.50MPa)	500 PSI (3.50MPa)
PRESSURE 3	190 PSI (1.31MPa)	87 PSI (0.60MPa)

## Titanium Shell and Tube Heat Exchanger

### Titanium Shell and Tube Heat Exchangers Nominal Performance for Pool Heating

Model	Normal Capacity		Shell (pool) side	Tube (Hot) side	Swimming Pool Capacity	
	kW	kBtu/Hr			m3	USGAL
SP-55Kti	16	55	1"	3/4"	15	3960
SP-85Kti	25	85	1"	3/4"	22	6600
SP-155Kti	45	155	1 1/2"	1"	40	11900
SP-210Kti	60	210	1 1/2"	1 1/2"	65	17200
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SP-360Kti	105	360	2"	1 1/2"	110	29000
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#### Note:

1. For occasional (holidays & weekends) use pools we recommend a 2x output multiplier to obtain a 2°F/hr heat up rate;
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Propylene Glycol 30%	94%
Propylene Glycol 50%	89%
Oil SAE10	50%
Oil ISO VG22	45%

#### Typical residential application:

Swimming pools, spas heating  
Hot tube heating

#### Typical industrial application:

Marine oil cooling or heating  
Offshore hydraulic oil cooling  
Sea food processing  
Waste water heat recovery  
Industry process applications

## Sidearm Heat Exchangers

Designed using the natural thermo-siphon on the domestic hot water side, our sidearm heat exchangers not only provide faster heating at a greater capacity than traditional sidearms, they prevent cross contamination in potable water application.

While the capacity of traditional sidearm heat exchanger is determined by the length of sidearm tubes and their heat transfer efficiency is comparatively very low. Instead of using two bare copper tubes, our fin-enhanced heat exchangers made of stainless steel and will have high heat transfer efficiency resulting from the utilization of an internal finned tube. This fin-enhanced design has a surface area five to eight times bigger than the bare tube design and produces significant turbulence on the system side. Our fin-enhanced sidearms provide a larger capacity and faster heating using a shorter unit. Fin-enhanced sidearms are available upon request.

### Double Wall Sidearm Heat Exchangers

Concerns about cross contamination of potable water has forced several US States to enact several regulations designed to prevent this from happening. Double wall sidearm heat exchangers present the most effective means of protection from cross contamination. Our vented double walled sidearm meets all the criteria of these regulation.

### Applications of the Sidearm Heat Exchanger

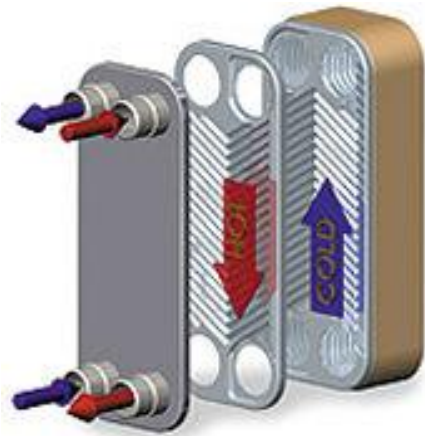
Due to its compact size and lightweight, these sidearm heat exchangers come highly recommended for use in domestic water heating and residential plumbing applications. Also called domestic water heat exchangers, they are typically used to heat domestic water using either a conventional boiler, outdoor wood furnace or a solar hot water system.



- I Domestic Hot Water Heating
- I Outdoor Wood Furnances
- I Solar Hot Water Heating

Typically the domestic water is circulated by means of the thermosiphon principle which saves on the cost of a pump and the associated electrical costs, In cases where faster heat recovery is required the domestic hot water should be circulated by means of a pump. Pump circulation will typically provide a heat recovery 3 to 4 times greater than thermosiphoning. We offer the following four models:

Model No.	BTU/hr	Length	Connection size		Construction	C-C Distance
			DHW Side	System side`		System Side
FES-115	22500	975mm	3/4"	3/4"	SS304	855mm
FES-115DW	18000	975mm	3/4"	3/4"	SS304	855mm
FES-95	18500	840mm	3/4"	3/4"	SS304	720mm
FES-95DW	15500	840mm	3/4"	3/4"	SS304	720mm



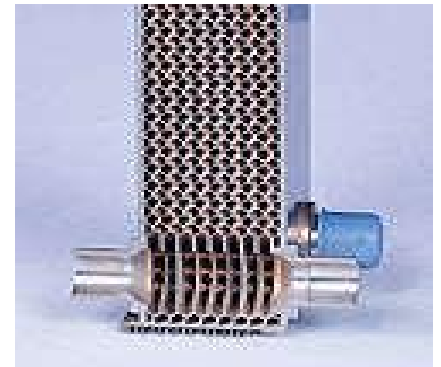
**Brazed Plate Heat Exchangers** represent the most compact, rugged and cost-effective means of transferring heat in many industrial and refrigerant applications. Built from stainless steel with copper or nickel brazing materials, they provide exceptional corrosion resistance. They feature corrugated plates that produce highly turbulent flow in a true counter-current direction. This results in high efficiency and a very compact heat exchanger design. Due to the smaller size and reduced material content, they can be the most economical heat transfer choice.

**Applications:**

- Ø Central Heating;
- Ø Heating and Cooling in HVAC installations;
- Ø Hydraulic and Lube Oil Coolers;
- Ø Tap Water and Radiator Heating;
- Ø Hydronic Heating;
- Ø Geothermic and Solar Heating;
- Ø Evaporation and Condensation in Refrigeration Systems;
- Ø Heat Recovery;
- Ø Steam Heating;
- Ø District or Zone Heating Systems

**I The Outstanding Features:**

- n Compact structure and easy installation;
- n Light in weight;
- n Small consumption of water;
- n Outstanding Overall Heat Transfer Coefficient;
- n Wide Variety of plate sizes and Patterns;
- n Durability and;
- n Low scaling coefficient.



**Because of the different material, the brazed plate heat exchangers have the following kinds:**

PHE	Nickel brazed plate heat exchangers	BPHE	Copper brazed plate heat exchangers
Plate material	AISI 316L	Plate material	AISI 316L/304
Connection material	AISI 316L	Connection material	AISI 316L/304
Brazed material	Nickel	Brazed material	Copper
Max design temp	150.C	Max design temp	250.C
Min design temp	-160.C	Min design temp	-160.C
Max design pressure	10 bar	Max design pressure	30bar,45 bar

**Four kinds of connection for your assembly**

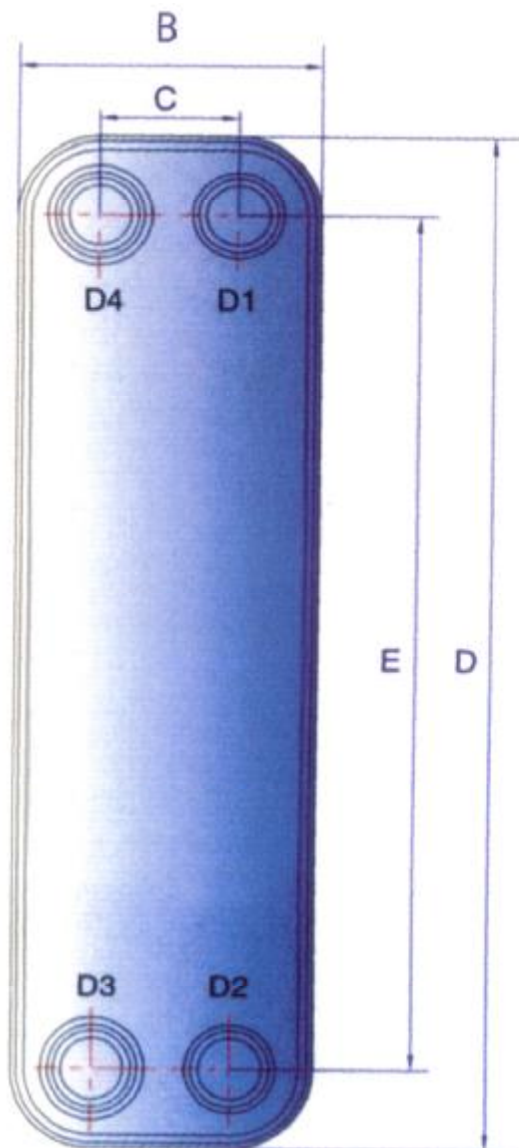
- n Male thread for heating and cooling system
- n Female thread for hydraulic system
- n Insert/butt for refrigerant circuit
- n clamp connection for cooling and refrigeration

Brazed Plate Heat Exchanger

I Specification of Brazed Plate Heat Exchanger

Type	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	Weight(kg)	Liquid Retardation Volume(Liter)	Heat Exchanging area(m <sup>2</sup> )
BL14	10+2.3N	76	42	206	172	0.7+0.06N	0.010(N-2)	0.014(N-2)
BL14A	10+2.3N	80	40	190	154	0.9+0.06N	0.010(N-2)	0.014(N-2)
BL15	8+2.3N	80	42	190	154	0.9+0.06N	0.01(N-2)	0.014(N-2)
BL20	10+2.3N	76	42	310	280	1.0+0.08N	0.018(N-2)	0.020(N-2)
BL26	10+2.35N	111	50	325	250	1.3+0.13N	0.025(N-2)	0.026(N-2)
BL30	13+2.4N	124	70	304	250	2.2+0.16N	0.032(N-2)	0.03(N-2)
BL50C	10+2.4N	111	50	525	466	2.0+0.19N	0.047(N-2)	0.050(N-2)
BL50D	10+2.5N	111	50	525	466	2.0+0.21N	0.047(N-2)	0.050(N-2)
BL95A	11+2.35N	191	92	616	519	7.8+0.36N	0.105(N-2)	0.095(N-2)
BL95B	11+2.72N	191	92	616	519	7.8+0.44N	0.125(N-2)	0.095(N-2)
BL100	10+2.15N	248	157	496	405	6.5+0.37N	0.08(N-2)	0.100(N-2)
BL200	13+2.7N	321	188	738	603	13+0.75N	0.220 (N-2)	0.210(N-2)
BL200A	13+2.7N	321	188	738	603	13+0.75N	0.220 (N-2)	0.210(N-2)
BL1400	22+2.78N	429	220	1398	1190	31.8+1.73N	1.55(N-2)	0.65(N-2)

Note: N indicated number of plate





## Gasketed Plate Heat Exchangers

The plate heat exchanger is formed up by a set of corrugated metal plates. The corrugated plates are mounted in a frame with a fixed plate on one side and a movable pressure plate and pressed together with tightening bolts. The corrugated plates serve not only to raise the level of turbulence, but also provide numerous supporting points to withstand the pressure difference between the media. The plate heat exchangers are widely applied in the following applications.

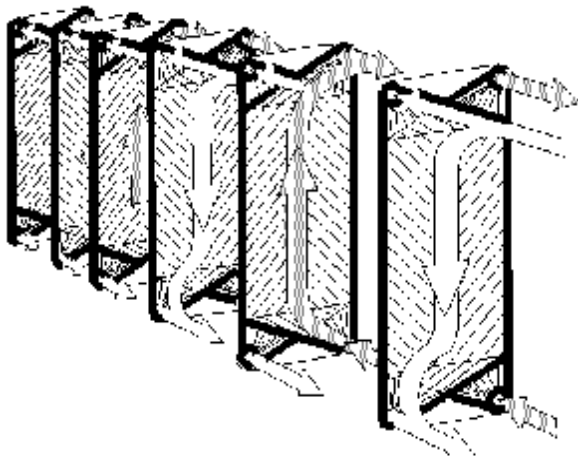
- Ø Metallurgical Industry
- Ø Power Generating Industry
- Ø Chemical Engineering Industry
- Ø HVAC Industry
- Ø Light Industry And Textile/Paper Industry
- Ø Electronics Industry
- Ø Automotive Industry
- Ø Pharmaceutical Industry
- Ø Food Processing Industry
- Ø District Heating

### I Features and Advantages

**High heating transferring** coefficient: as the flowing made in the plate pack forms up turbulence at low Re and the smooth plates have little possibility of forming scale, the plate heat exchanger has a heat transferring coefficient over  $5000\text{W}/\text{m}^2\text{k}$ , which is 2-4 times that of the shell-and-tube exchanger.

**High heat recovery rate:** Thanks to the high heat-transferring coefficient, the heat transferring temperature difference can be very low Therefore, it is very well suited to low energy level heat recovery. Normally heat recovery using a plate heat exchanger can be as high as 90%.

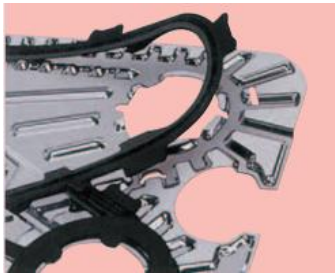
**Great flexibility:** As plates can form up different flow routes, plate heat exchanger can have optimum designs and can flexibly suit to the changes in heat exchanged by increasing/decreasing the number of plate without changing the frame to adapt to the new installation condition.



**Low flow stagnation:** Due to small flow passages and low flow stagnation, plate heat exchanger has good temperature control and is light in weight. Plate Heat Exchanger has specially great advantage where treating of heat sensitive matter is expected.

**Compact structure:** Of the various kinds of heat exchangers, plate heat exchanger takes the smallest space. With the identical heat exchanging conditions, a plate heat exchanger takes about 1/3 to 1/4 that of a shell and tube heat exchanger. What is more, it needs no extra space for maintenance when begin detached.

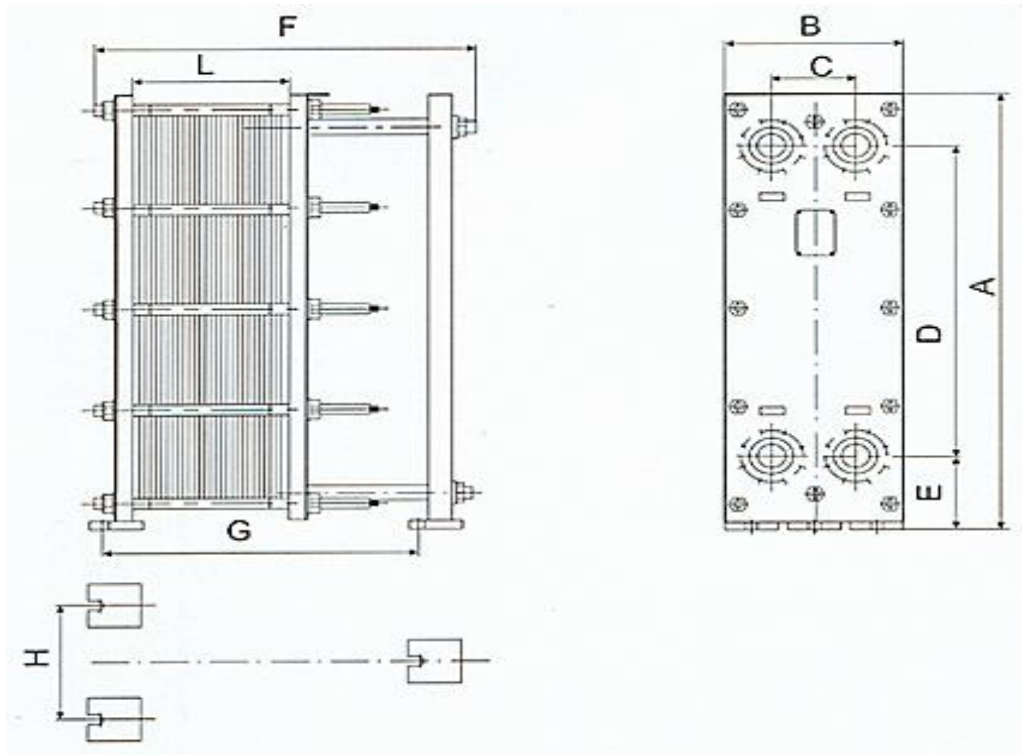
**Easy maintenance:** Plate is so designed that it leaves no dead flow area, so site chemical clean up is possible without detaching the plates. Under normal circumstance, single flow passage layout will have the inlet and outlet of the heat exchanging medium fixed on the frame plate. This design makes it unnecessary to remove the pipeline when it comes to cleanup or plate maintenance, thereby shortening your downtime.



**Material of gasket** from designated material supplier protection groove for the gasket “roof type” gasket profile high temperature solidifying epoxy resin glue, or glue free gasket

**Fixation and sealing:** functions of fixation and sealing of the clip-on gasket are separate. Therefore, even if fixation goes wrong the gasket retains its sealing function.

**I Product Specifications**



**I Specification of Gasketed Plate Heat Exchanger**

Type	L (mm)	A (mm)	B (mm)	C (mm)	D (mm)	F (mm)	Connection size (mm)	Max number of plates	Max flow rate (m³/h)
BH30	N(2.0+X)	540	185	85	357	400	30	150	18
BH60	N(2.0+X)	930	320	140	640	1200	60	250	36
BH60H	N(3.0+X)	930	320	140	640	1200	60	203	36
BH100	N(2.55+X)	1069	470	225	719	1600	100	278	140
BH100H	N(3.95+X)	1069	470	225	719	1600	100	180	140
BH150	N(2.5+X)	1815	610	298	1294	3000	150	600	360
BH150H	N(3.95+X)	1815	610	298	1294	3000	150	600	360
BH150E	N(3.95+X)	1418	610	298	897	3000	150	300	360
BH200	N(4.0+X)	2150	780	355	1480	3000	200	398	600
BH250	N(3.5+X)	2415	1100	560	1460	2340	250	300	795
BH300	N(3.5+X)	2730	1150	596	1842	5220	350	600	1400

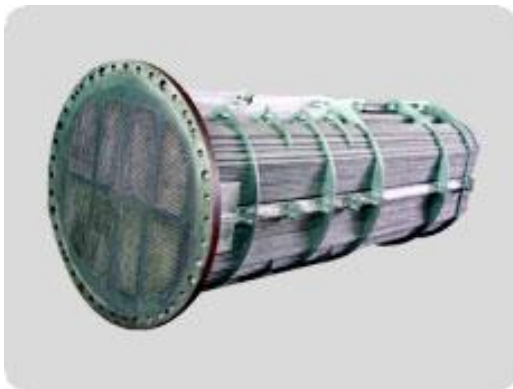
**Note: N indicated number of plate**

## I The Simple Comparison between The Material of Gasket and Use Medium

Type	Material	Applicable temperature	Applicable fluids
Plate	Stainless steel(SUS304.316 etc)	/	Clean water, rive water, edible oil, mineral oil
	Titanium and titanium-palladium	/	Sea water, salty water, salinous compounds
	20Cr,18Ni,SMO	/	Low concentration sulfate acid, water solution of salinous matter, inorganice water solution
	Nickel	/	High temperature and high concentration caustic soda
	Hastelloy	/	High concentration sulfate acid, chloride acid, phosphate acid
Gasket	NBR	-15~+135	Water, sea water, mineral oil, salinous water
	EPDM	-25~+180	Hot water, steam, acid, alkali
	F26	-55~+230	Acid, alkali, fluids
	FTP	0_+160	High concentration acid, alkali, high temperature oil, steam

## Shell & Tube Heat Exchanger

- I U type dry expansion evaporator  
Capacity: 20-600kW
- I Dry expansion heat exchanger  
Capacity: 100-2000kW
- I Flooded heat exchanger  
Capacity: 370-2000kW



### Applications:

- I Chemical engineering industry
- I Power generation
- I Petrochemical
- I Paper and pulp
- I Petroleum
- I Pharmaceutical
- I Metallurgy industry
- I Food processing industry
- I HVAC & Refrigeration
- I District heating

Please feel free to contact us for further information.