ARES PHE was founded in 2002 and has been serving successfully in plate heat exchanger market in the world. Its 25 year experience in plate heat exchanger market and its experienced staff made us one of the top plate heat exchanger manufacturers around the globe. We have been supplying high quality products to various markets. Our effort for continuous improvement leads us to find the most effective and innovative ways to find solutions to our customers in heat transfer technology.

ARES PHE has 8.000m2 production lot that located in south of Turkey and sales and distributor network around the world. Plate sizes range from 0.04m2 to 2m2 both normal type and free flow plates to be used in HVAC, Chemical, Power, Textile, Sugar, Marine and other types of areas where plate heat exchangers are used.

ares®
PHE

General Information About Plate Heat Exchanger

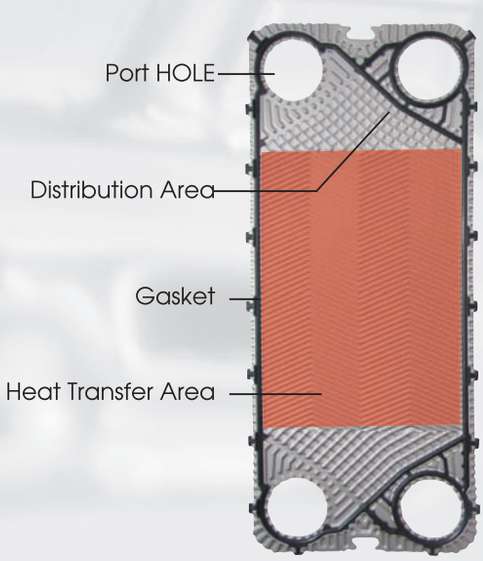
STRUCTURE OF PLATE HEAT EXCHANGER

The main element of the plate heat exchanger is the metal plate which has herringbone pattern. In addition to the heat transfer plate the plate heat exchanger consists of other elements such as; gaskets, front and rear frame and nuts and bolts.
The gaskets are attached to heat transfer plates and placed between front and rear frames and using the bolts, the plate pack is tightened to the minimum plate pack distance. This operation lets plate heat exchangers work under pressure.

RIGHT PLATE

STRUCTURE OF PLATE

The heat transfer plates mainly produced from SS304, SS316, SMO, Hastelloy or Titanium material, 0,5mm - 1mm plate sheets. Depending on the application and fluid the material of the plates and gaskets may vary. In general there are four port holes on the plates which lets the hot and cold fluids flow in to the heat transfer plates. After the fluid enters the plate through port holes, it makes it way to the distribution area. The distribution area helps the fluid spread evenly on the heat transfer plate. The heat transfer is achieved between the two distribution areas.



LEFT PLATE

THE TYPES OF THE PLATES

In general there are two types of plate for each model which are thermally long and thermally short plates. The difference between these plates is that the wide and narrow angle on the herringbone pattern.

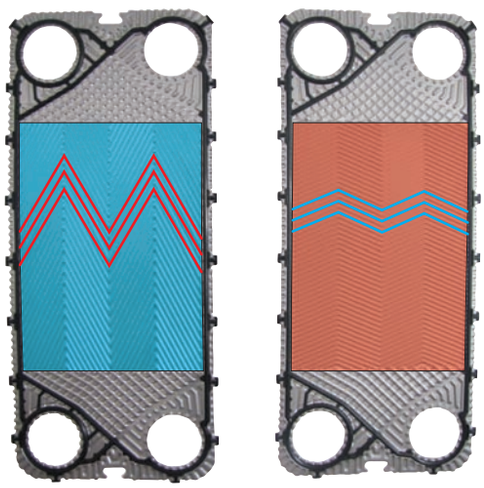
Thermally Long Plates:

- High Turbulence Output
- Close Temperature Approach (LMDT:1C)
- High Pressure Loss

Thermally Short Plates

- Low Turbulence Output
- Low Heat Transfer Value
- Low Pressure Loss

The plate pack may consist of either thermally long and short plates or just one type plate depending on the application. The main factor is the given pressure loss to determine the number of thermally long or short plates.



Thermally Short Thermally Long

GASKET TYPES

The gaskets are among most critical elements of the plate heat exchangers. Depending on the temperatures and fluid type the material of the gaskets may vary. The most common type of gaskets are NBR and EPDM gaskets. For different applications there other specific types of gaskets such as Viton and Silicone. The contamination or mixing of the two fluids are prevented by using the following gaskets system. Only one side of the gasket has contact with the fluid and the other side has contact with the atmosphere. Therefore, in any case of leakage, the fluid runs outside of the plate heat exchanger rather than mixing with the other fluid.

Maximum Working Temperature	
EPDM	140 C - 160 C
NBR	120 C - 140 C
VITON	180 C - 200 C

General Information About Plate Heat Exchanger

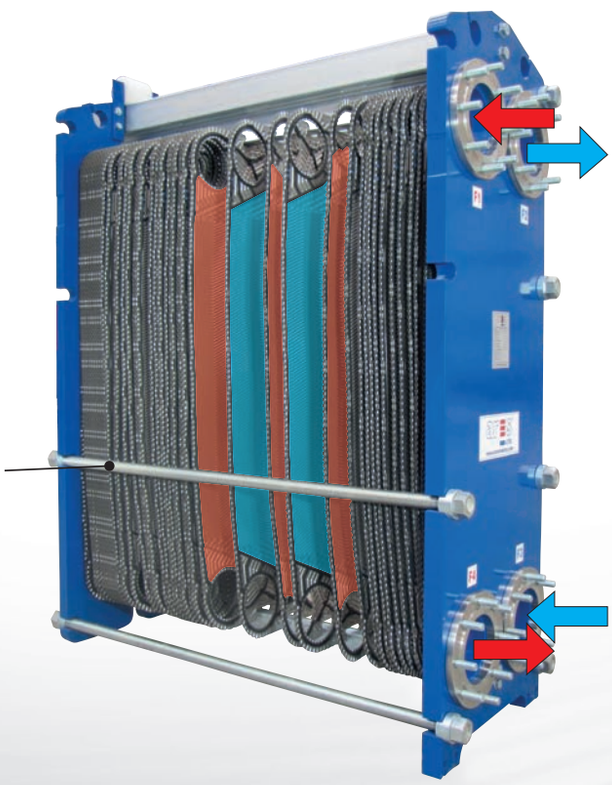


PLATE HEAT EXCHANGER WORKING PRINCIPLE

The working principle of the plate heat exchanger is based on the heat transfer method between plates. Two fluids (cold and hot) enters the plate heat exchanger and by the help gaskets, the fluids enters the correspondent plate and runs through different channels to achieve heat transfer without mixing with each other.

When the plate pack is placed between two frames, the minimum tightening distance is calculated according to the number of plates and type of the gaskets. In order for the plate heat exchanger to work under certain pressures, it must be tightened to certain distance by using the bolts. After the plate pack is tightened together, the unit is ready for operation.

ADVANTAGES OF PLATE HEAT EXCHANGER

Ease of Increase Capacity

• Additional plates can be added to a operating plate heat exchanger

High Output - Less Cost

• As a result of plate technology, compare to shell and tube heat exchangers, the plate type heat exchangers have better heat transfer values.

• Compare to shell and tube heat exchangers, plate heat exchangers requires 3 to 5 times less space to operate.

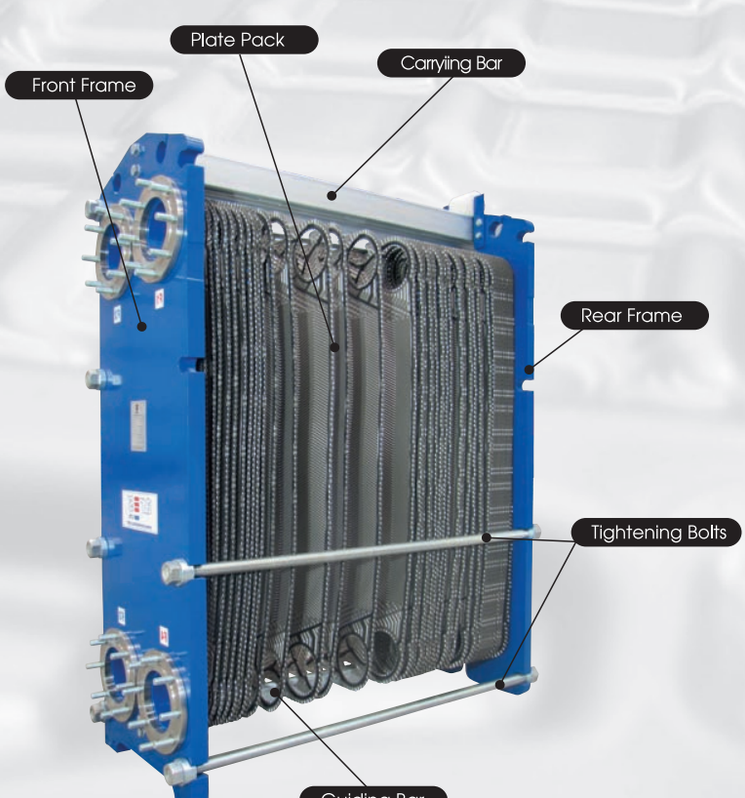
• The installation and assembly costs are much lower compare to shell and tube heat exchangers.

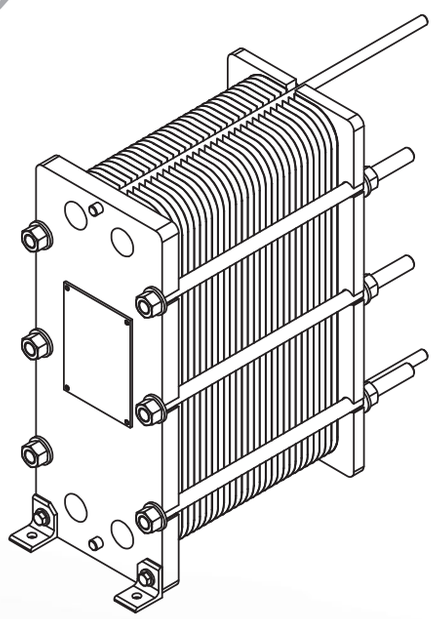
• The plate type heat exchanger is capable of creating high turbulence which results in higher heat transfer coefficient compare to shell and tube heat exchangers.

Service and Maintenance

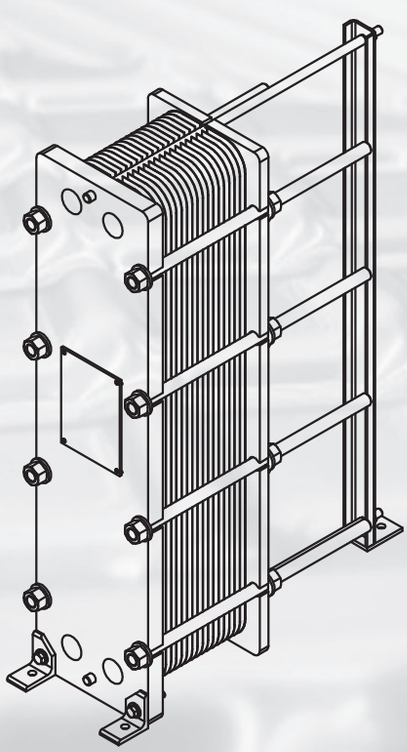
• The whole heat transfer area can be reached by only loosening by the bolts of the plate heat exchanger.

• The time for maintenance (cleaning, leak control etc.) is significantly reduced.

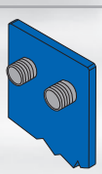
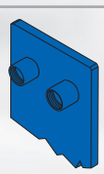




A1 S	
Nozzle Diameter	DN32
Max. No. of Plates	
P10	55
P16	90
Max Flow Rate	15 m^3/hr
Dimensions	
Height:	475 mm
Width:	190 mm
Length:	100 mm
Working Pressure (PED)	PN10 - PN16
Working Pressure (ASME)	150 300

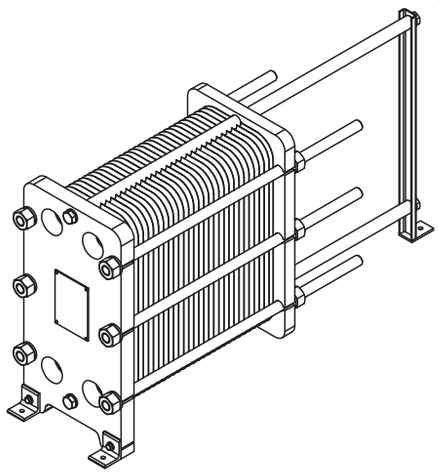


A1L	
Nozzle Diameter	DN32
Max. No. of Plates	
P10	55
P16	90
Max Flow Rate	15 m^3/hr
Dimensions	
Height:	760 mm
Width:	190 mm
Length:	100 - 500 mm
Working Pressure	PN10 - PN16
Working Pressure (ASME)	150 300

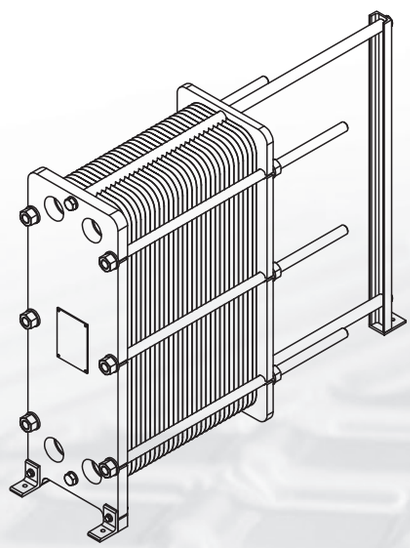
Connection Types			
			
	AISI316 BSP	Threaded Frame	DIN 2986

A 2 SERİES

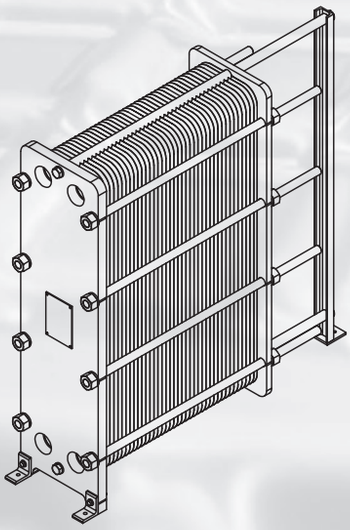
A2 S	
Nozzle Diameter	DN50
Max. No. of Plates	
P10	50
P16	87
P25	210
Max Flow Rate	50 m^3/hr
Dimensions	
Height	600 mm
Width	305 mm
Length	100 - 1000 mm
Working Pressure	PN10 - PN16 - PN25
Working Pressure (ASME)	150 300

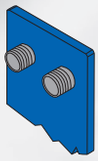
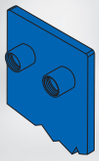


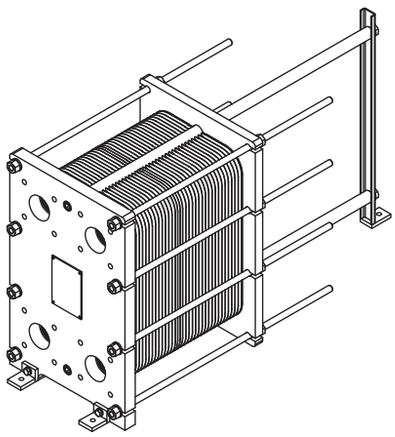
A2M	
Nozzle Diameter	DN50
Max. No. of Plates	
P10	50
P16	87
P25	325
Max Flow Rate	50 m^3/hr
Dimensions	
Height	900 mm
Width	
Length	100 - 1000 mm
Working Pressure	PN10 - PN16 - PN25
Working Pressure (ASME)	150 300



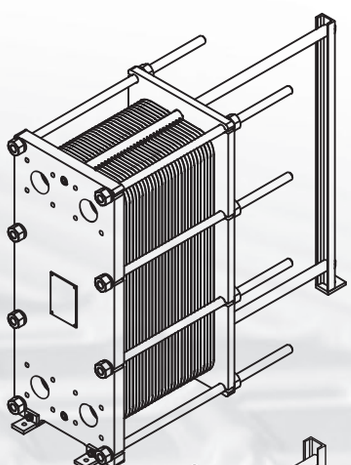
A2L	
Nozzle Diameter	DN50
Max. No. of Plates	
P10	55
P16	90
P25	420
Max Flow Rate	50 m^3/hr
Dimensions	
Height	1100 mm
Width	305 mm
Length	100 - 1000 mm
Working Pressure	PN10 - PN16 - PN25
Working Pressure (ASME)	150 300



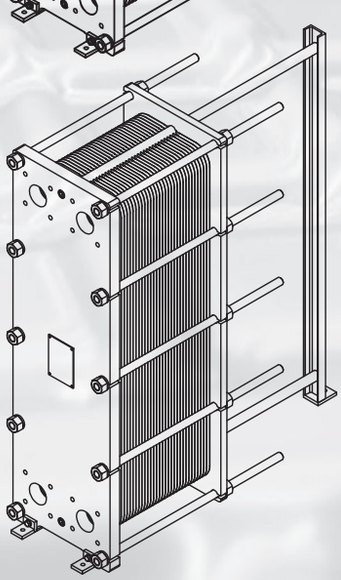
Connection Types			
			
	AISI316 BSP	Threaded Frame	DIN 2986



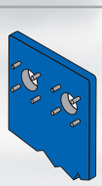
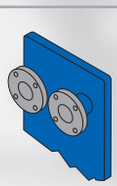
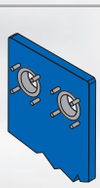
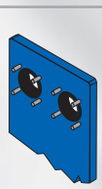
A3S	
Nozzle Diameter	DN50
Max. No. of Plates	
P10	130
P16	458
Max Flow Rate	110 m^3/hr
Dimensions	
Height:	630 mm
Width:	400 mm
Length:	100 - 1000 mm
Working Pressure	PN10 - PN16
Working Pressure (ASME)	150 300



A3M	
Nozzle Diameter	DN65
Max. No. of Plates	
P10	130
P16	458
Max Flow Rate	110 m^3/hr
Dimensions	
Height:	950 mm
Width:	400 mm
Length:	100 - 1000 mm
Working Pressure	PN10 - PN16
Working Pressure (ASME)	150 300

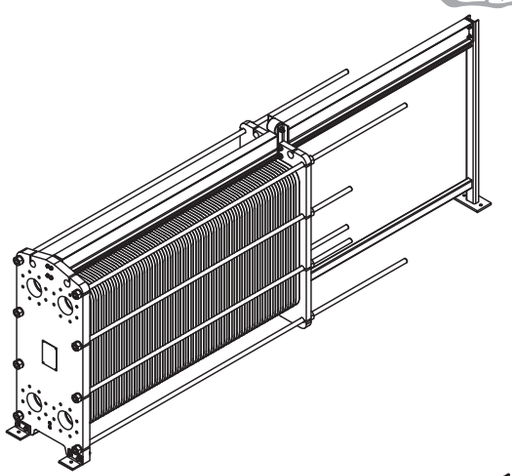


A3 L	
Nozzle Diameter	DN65
Max. No. of Plates	
P10	115
P16	546
Max Flow Rate	110 m^3/hr
Dimensions	
Height:	1300 mm
Width:	400 mm
Length:	100 - 1000 mm
Working Pressure	PN10 - PN16
Working Pressure (ASME)	150 300

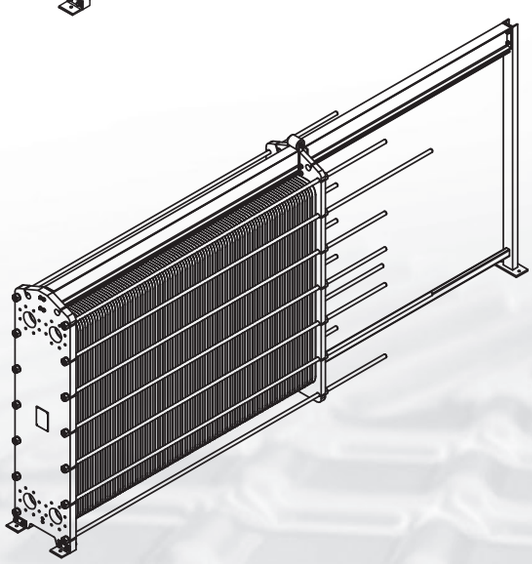
Connection Types				
				
	STUDDED	FLANGED	316/ALLOY CLADDED	RUBBER

A 4 SERİES

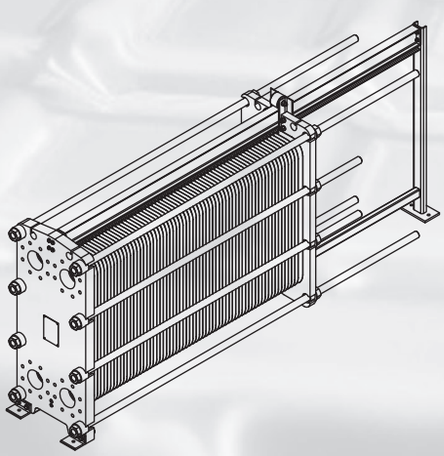
A4 S	
Nozzle Diameter	DN100
Max. No. of Plates	
P10	155
P16	690
P25	690
Max Flow Rate	165 m^3/hr
Dimensions	
Height	1150 mm
Width	485 mm
Length	600 - 3000 mm
Working Pressure	PN10 - PN16 - PN25
Working Pressure (ASME)	150 300

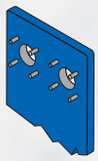
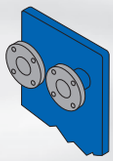
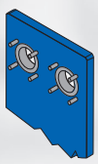
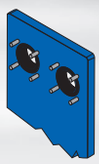


A4 M	
Nozzle Diameter	DN100
Max. No. of Plates	
P10	115
P16	546
P25	
Max Flow Rate	165 m^3/hr
Dimensions	
Height	1836 mm
Width	485 mm
Length	600 - 6000 mm
Working Pressure	PN10 - PN16 - PN25
Working Pressure (ASME)	150 300



A4 A	
Nozzle Diameter	DN100
Max. No. of Plates	
P10	155
P16	690
P25	690
Max Flow Rate	165 m^3/hr
Dimensions	
Height	1130 mm
Width	485 mm
Length	600 - 3000 mm
Working Pressure	PN10 - PN16
Working Pressure (ASME)	150 300



Connection Types				
				
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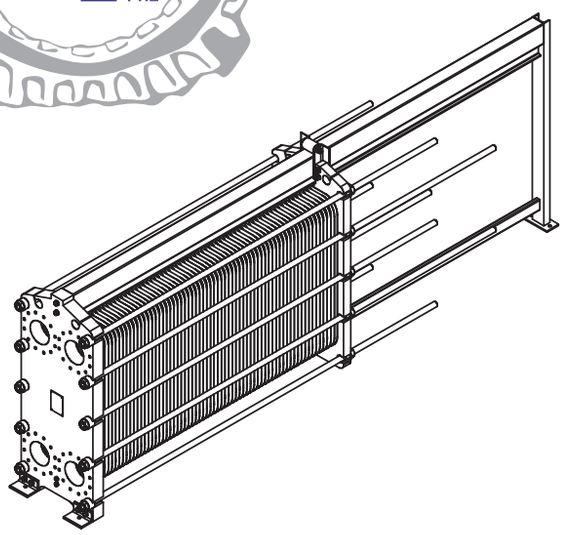
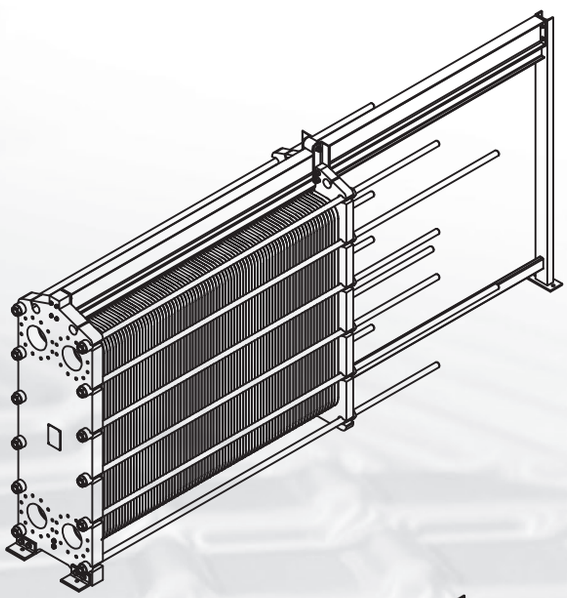
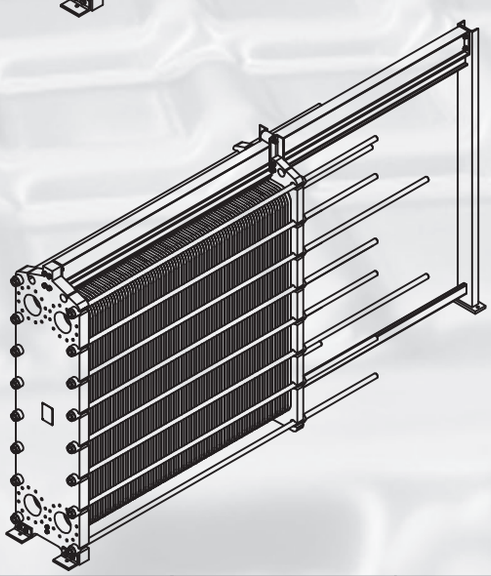


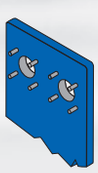
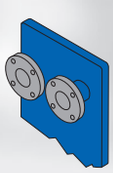
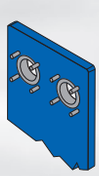
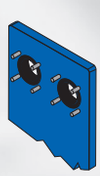
A6 S	
Nozzle Diameter	DN150
Max. No. of Plates	
P6	300
P10	670
P16	670
P25	650
Max Flow Rate	380 m^3/hr
Dimensions	
Height	1497 mm
Width	625 mm
Length	600 - 6000 mm
Working Pressure	PN6 - PN10 - PN16 - PN25
Working Pressure (ASME)	150 300



A6 M	
Nozzle Diameter	DN150
Max. No. of Plates	
P6	300
P10	670
P16	670
P25	650
Max Flow Rate	380 m^3/hr
Dimensions	
Height	1929 mm
Width	625 mm
Length	600 - 6000 mm
Working Pressure	PN6 - PN10 - PN16 - PN25
Working Pressure (ASME)	150 300

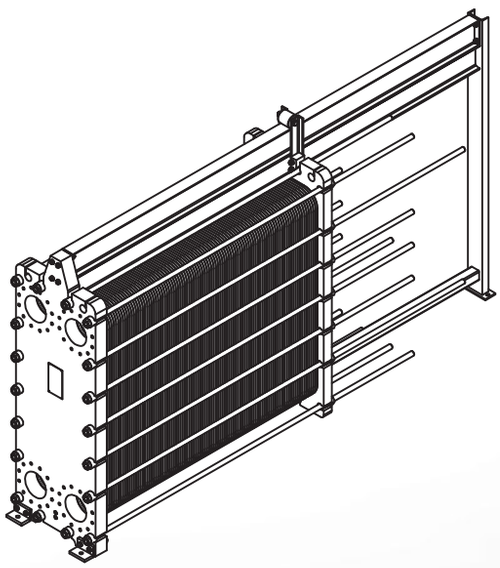


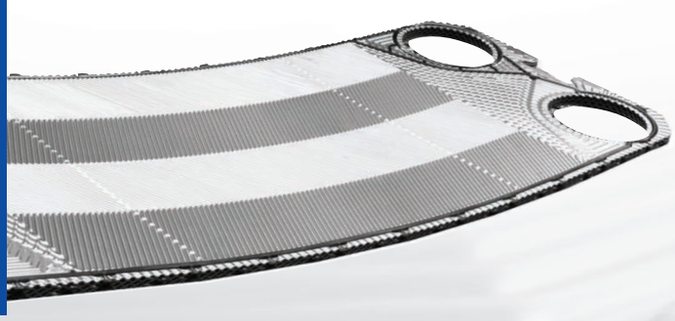
A6 L	
Nozzle Diameter	DN150
Max. No. of Plates	
P6	300
P10	670
P16	670
P25	650
Max Flow Rate	380 m^3/hr
Dimensions	
Height	2351 mm
Width	625 mm
Length	600 - 6000 mm
Working Pressure	PN6 - PN10 - PN16 - PN25
Working Pressure (ASME)	150 300

Connection Types				
				
	STUDDED	FLANGED	316/ALLOY CLADDED	RUBBER

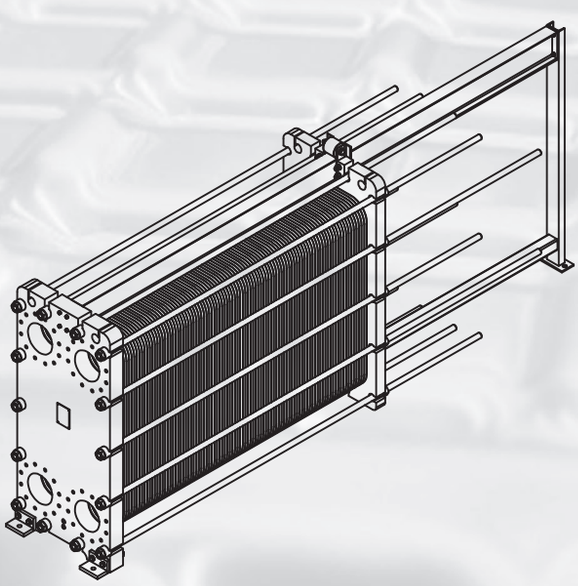
A 8 SERİES

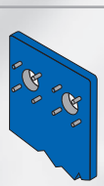
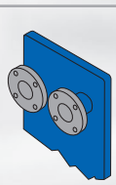
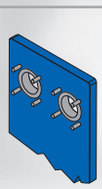
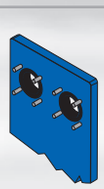
A8 L	
Nozzle Diameter	DN200
Max. No. of Plates	
P6	320
P10	690
P16	690
P25	680
Max Flow Rate	650 m^3/hr
Dimensions	
Height	2330 mm
Width	780 mm
Length	600 - 6000 mm
Working Pressure	PN6 - PN10 - PN16 - PN25
Working Pressure (ASME)	150 300

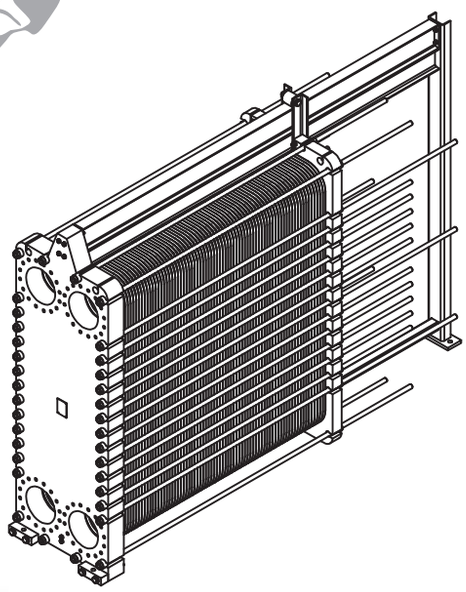




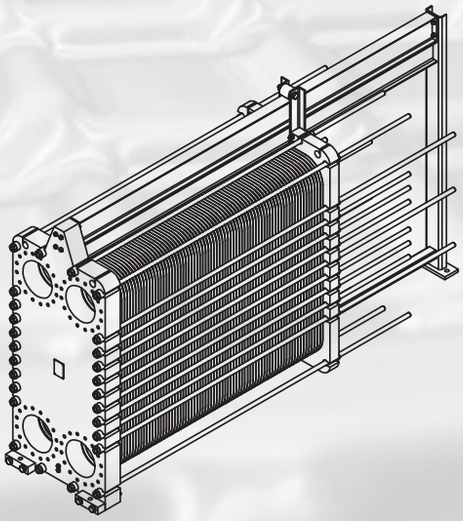
A8 M	
Nozzle Diameter	DN200
Max. No. of Plates	
P6	320
P10	690
P16	690
P25	680
Max Flow Rate	650 m^3/hr
Dimensions	
Height	1710 mm
Width	780 mm
Length	600 - 6000 mm
Working Pressure	PN6 - PN10 - PN16 - PN25
Working Pressure (ASME)	150 300



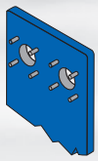
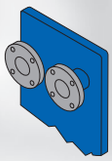
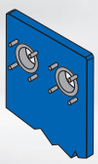
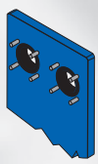
Connection Types				
				
	STUDDED	FLANGED	316/ALLOY CLADDED	RUBBER



A12 L	
Nozzle Diameter	DN300
Max. No. of Plates	
P10	890
P16	890
P25	890
Max Flow Rate	1550 m^3/hr
Dimensions	
Height	3085 mm
Width	1050 mm
Length	600 - 6000 mm
Working Pressure	PN6 - PN10 - PN16 - PN25
Working Pressure (ASME)	150 300

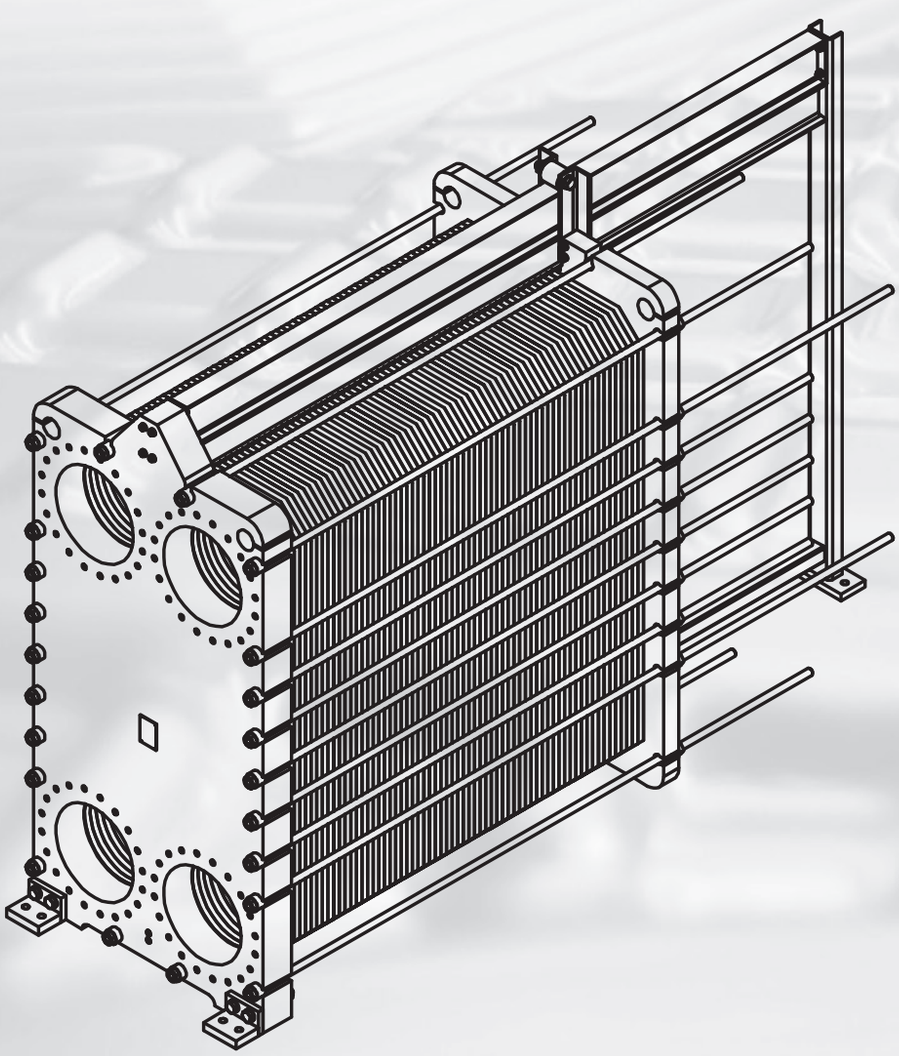


A12 M	
Nozzle Diameter	DN300
Max. No. of Plates	
P10	890
P16	890
P25	890
Max Flow Rate	1550 m^3/hr
Dimensions	
Height	2456 mm
Width	1050 mm
Length	600 - 6000 mm
Working Pressure	PN6 - PN10 - PN16 - PN25
Working Pressure (ASME)	150 300

Connection Types				
				
	STUDDED	FLANGED	316/ALLOY CLADDED	RUBBER

A 20 M

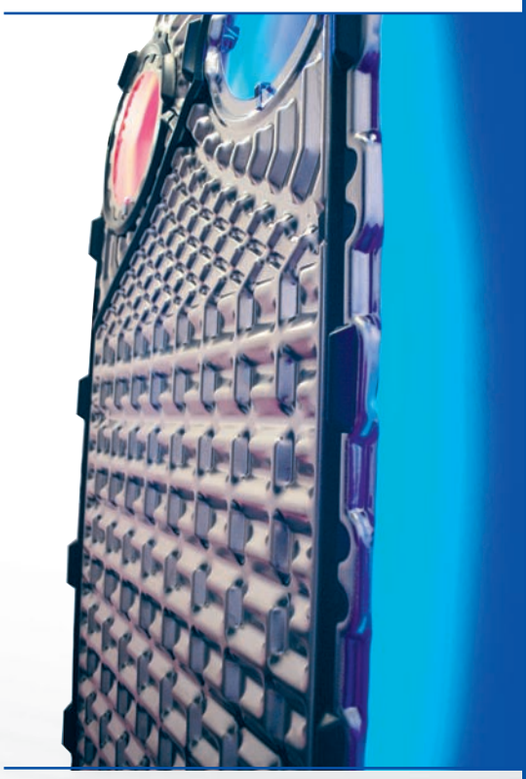
A 20 M	
Nozzle Diameter	DN500
Max. No. of Plates	
P10	920
P16	920
Max Flow Rate	3000 m^3/hr
Dimensions	
Height	2958 mm
Width	1450 mm
Length	600 - 6000 mm
Working Pressure	PN10 - PN16
Working Pressure (ASME)	150



AWG SERİES

AWG Series of ARES Plate Heat Exchangers consists of only wide gap plates. Compare to A Series plates, AWG plates have 5.5mm to 12 mm plate gap which makes them easier to use in applications where contamintaion in the fluid is high.

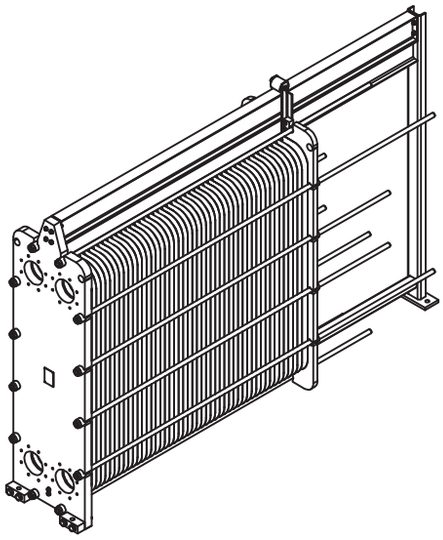
Generally, AWG PHE products are used in textile, paper, sugar and similar applications where the fluid contains solid particles. The thickness of the AWG Series plates ranges from 0.8mm to 1 mm. The gasket material is NBR and EPDM based material as in A Series models. ARES PHE has specialized itself in sugar, textile, ethanol and other applications, where wide gap plate type heat exchangers are used.

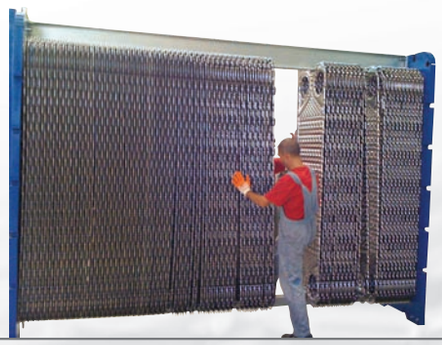


AWG

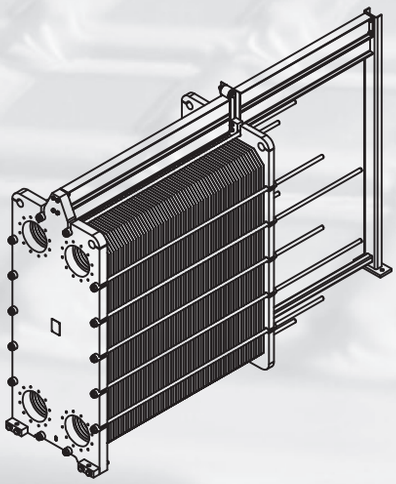
AWG

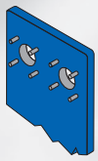
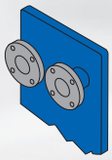
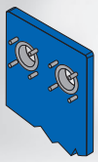
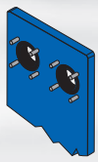
AWG 8	
Nozzle Diameter	DN200
Max. No. of Plates	
P10	300
Max Flow Rate	
Height	2769 mm
Width	810 mm
Length	1000 - 6000 mm
Working Pressure	PN10
Working Pressure (ASME)	150 300





AWG 12	
Nozzle Diameter	DN300
Max. No. of Plates	
P10	340
Max Flow Rate	
Height	2865 mm
Width	1150 mm
Length	1000 - 6000 mm
Working Pressure	PN10
Working Pressure (ASME)	150 300

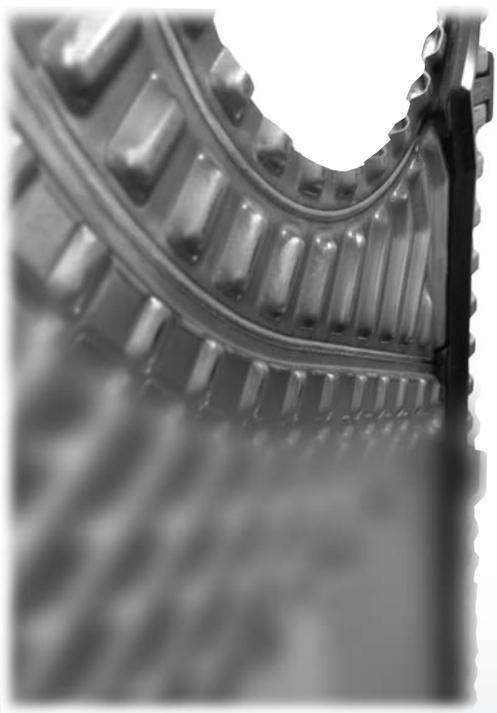


Connection Types				
				
	STUDDED	FLANGED	316/ALLOY CLADDED	RUBBER

ASW - ADP

ASW SERIES

ARES Semi Welded plate heat exchangers consist of cassettes. A cassette contains two plates laser welded together. The advantage of this method is; one side has a welded plate channel and the other side has a traditional plate channel with gaskets. On the welded side, there are two specially produced corner hole gaskets creating the sealing between two cassettes. Thus, the gasket exposure to the fluid is reduced to a minimum on welded side.



Areas of Application:

- Used as NH3 evaporator and condenser in refrigeration industry.
- Heating and cooling of fluids, aggressive against gaskets.
- Cooling acids in sulfuric acid production.

ADP SERIES

ARES Double Plate (ADP) Series plate heat exchangers consist of two thin flow plates pressed together. The two plates form a pair of plates which allows possible leaks to be seen from outside between two plates. This operation prevents internal leakage even plate is damaged or cracked.

Areas of Application:

- Milk and Cream Industry
- Sanitary water for food processing
- Water for medical injection/ultra pure water
- District heating/tap water
- Engine cooling

APS

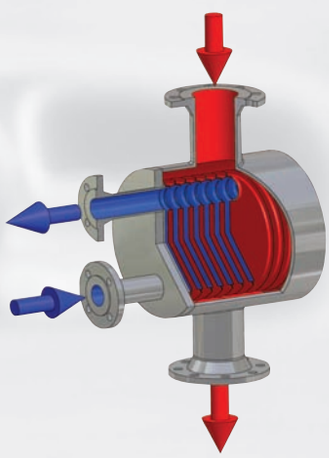
APS SERIES

APS Series are welded type plate heat exchanger and mainly used in areas where gasketed type plate heat exchangers cannot be used such as high temperatures and hig pressure. ARES PHE offers wide range of plate and shell type heat exchanger to be used in heating-cooling, power, chemical, paper, oil and gas and other type of applications.

TECHNICAL DETAILS

The working principle of APS Series plate heat exchangers is similar to shell and tube type heat exchanger. Instead of using tube bundles, the stainless steel plate pack is used to achieve heat transfer. The plates are laser welded together and a result of this operation, no gasket is used neither between the plates nor at the connections.

- Maximum working temperature : 400 C
- Maximum working pressure: 40 bar
- Higher heat efficiency and sudden heat transfer.
- Low installation and maintenance costs as a result of plate technology and compact design



BRAZED PLATE HEAT EXCHANGERS

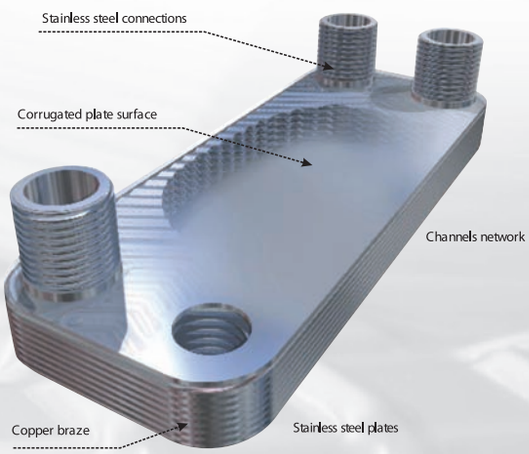
BRAZED PLATE HEAT EXCHANGERS

The brazed heat exchanger (also known as BPHE, CBHE etc.) is basically made up of a pack of 0.3mm-0.5mm corrugated stainless steel plates that are brazed together using copper as a brazing material to form a gasket free plate heat exchanger.

Brazing using copper eliminates the need of either frames or gaskets and results in a very compact exchanger. In addition, instead of copper nickel or other brazing material is used. Since the plates are brazed together and no frame and gasket is used, brazed plate heat exchangers can stand higher temperatures up to 200 C and pressure up to 30 bar compare to traditional gasketed type heat exchangers.

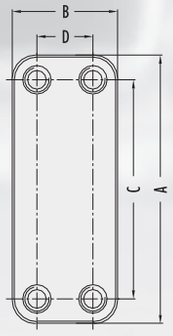
Typical Applications

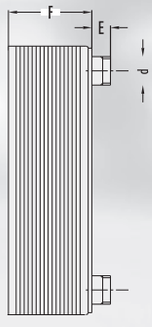
- District Heating
- Solar Heating and Air-Conditioning Units
- Heat Pumps and Heat Recovery Units
- Evaporation and Condensation
- Refrigeration



TECHNICAL PARAMETERS

Heat exchanger type	Dimensions mm					Heat exchange surface	Channel volume	Maximum flow	Max plates quantity	Mass
	A	B	C	D	F	m^2	dm^3	m^3/h		kg
LA14	201	80	164	42	9+2,3·NP	0,014	0,022	5,1	60	0,8+0,05·NP
LA22	300	80	260	42	9+2,3·NP	0,022	0,035	5,1	60	1,1+0,08·NP
LA34	469	80	432	42	9+2,3·NP	0,034	0,054	5,1	60	1,7+0,12·NP
LB31	286	117	232	68	9+2,4·NP	0,031	0,047	12,8	150	1,9+0,12·NP
LB47	414	117	360	68	9+2,4·NP	0,047	0,072	12,8	150	2,3+0,19·NP
LB60	534	117	480	68	9+2,4·NP	0,060	0,091	12,8	150	2,6+0,24·NP
LC110	463	255	378	170	10+2,4·NP	0,110	0,162	32,5	200	4,3+0,39·NP
LC170	685	255	600	170	10+2,4·NP	0,170	0,255	32,5	200	5,9+0,60·NP
LD235	784	306	682	204	12+2,6·NP	0,235	0,398	90	280	19+0,81·NP





MATERIALS:
- plates and conections: stainless steel,
- brazing: copper.

MEDIA:
Water, steam, air, neutral liquids and gases.
To use other media, please consult our Sales Dept.

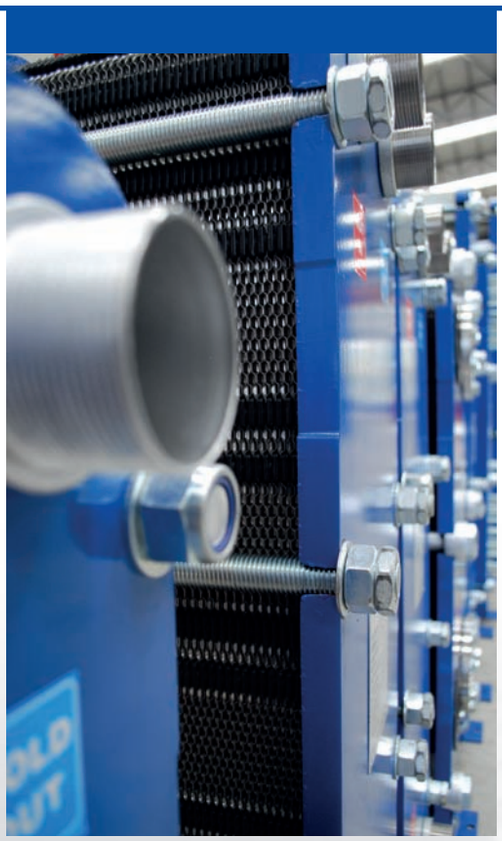
WORK PARAMETERS:

	Max pressure:	Min/Max temperature:
-copper braze	LA, LB: 3,0 MPa LC, LD: 2,5 MPa	-195°C/230°C

Special types up to 10 MPa are possible.

NP - number of plates

ARES



ADVANTAGES OF ARES Plate Heat Exchangers

- Low investment, operation and service costs
- Full technical support including commissioning and supervision
- High efficient heat transfer values
- Perfect temperature approach (LMDT: 1 C)
- High turbulent flow
- %70 less space needed compare ST Heat Exchangers
- Ease of increasing capacity
- Low operating weight
- Energy saving
- %100 guarantee for spare part availability
- Large plate range from DN32 to DN500

ARES has been certified with ISO 9001/2000.
Each plate heat exchanger is subject to hydro-static test by ARES and additional third party inspection is available for BV, ABS, RINA, GL, DNV, TÜV etc.

APPLICATIONS

Automotive Indsutry
Cooling of Quenching Oil
Heating of Degreasing baths
Heating of Phosphatizing baths

Chemical Indsutry
Cooling Various Types of Acids
Closed Loop Cooling
Cooling/ Heating of Brine
Wet Chlorine gas drying
Evaporators & Condensers

Edible Oil Industry
Heating and Cooling of Vegetalbe
Oil Cooling Fatty Acids
Bio-Diesel Applications

HVAC
District Heating and Cooling
Underfloor Heating
Heating Treatment Water
Heating Swimming Pools
Heat Pump Applications
Heat Recovery Installations
Geothermal Applications
Solar Energy Applications
Airconditioning Plants
Tap water heating

POWER
Cooling of Co-Generation Plants
Turbine Lube oil Cooling
Heat Recovery from Diesel Plants
Cooling Transmission Oil
Circulating Water Cooling
Condensate Heater
Generator Bearing Cooler

PULP AND PAPER
Cooling of Waste Water
Waste Water Concentration (Evaporation)
Cooling of Spray Water

STEEL INDUSTRY
Mould Cooling
Closed Loop Cooling of Continous Casting Machine
Closed Loop Cooling of Electric Arc Furnace
Closed Loop Cooling of Blast Furnace
Cooling Machine Coolants
Cooling of Hydraulic and Lube oils

SUGAR INDUSTRY
Heating of Raw Juice
Heating of Press Water
Heating of Limed Juice
Heating of Carbonated Juice
Heating of Thin Juice
Heating of Syrups
Heating /Cooling of Molasses

MARINE
Central Cooling
Lubrication Oil Cooling
LT and HT circuit Cooling
Pre-Heating of HFO and MDO
Cooling Transmission Oil
Auxilary System Cooling

MACHINES
Closed Loop Cooling
Cooling of Hydrolic and lube oils
Closed loop cooling of Induction
Sytems

SURFACE TREATMENT
Cooling of electrolyte
Cooling of Electroplasting Baths
Heating of Degreasing Baths
Heating of Phosphatizing Baths

TEXTILE INDUSTRY
Heat Recovery from Textile Washing Agents
Heating Wool Washing Liquids
Heating Dyeing Liquors
Cooling of Waste Water

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PHE

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