

Schmidt

**SCHMIDT™
BRAZED
PLATE HEAT
EXCHANGERS**



API Heat Transfer

...world leaders in heat transfer technology



**Over a century
of experience
in heat transfer
advancement.**

With thousands of installed units worldwide, API Heat Transfer's line of Schmidt Brazed Plate Heat Exchangers are known for:

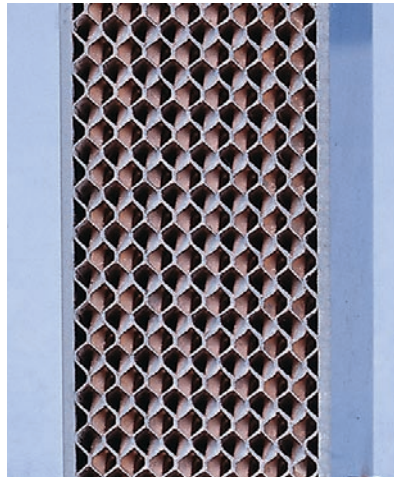
- *High Reliability*
- *Superior Efficiency*
- *Rugged Construction*
- *Quick Availability*

API Heat Transfer has grown to become a major global provider of industrial heat transfer equipment. Four plants serving the process and refrigeration industries design and produce a variety of shell and tube, plate and frame, brazed plate and brazed aluminum designs. A worldwide network of qualified representatives and engineers assures the best heat exchanger selection for your needs.

The brazed plate heat exchanger has revolutionized heat transfer.

This heat exchanger combines all the best features of existing heat transfer equipment into a bold new technology that offers significant benefits.

The critical parameter for any heat exchanger is the amount of surface area required to deliver a given amount of heat transfer. The capital cost of heat transfer equipment is commensurate with the amount of surface area, which in turn is directly proportional to the rate of heat transfer.



Cutaway of brazed plate heat exchangers shows corrugated stainless steel plates that produce highly turbulent counter-current flow.

Heavy Duty by Design

When the thermal plates of a brazed plate heat exchanger are assembled together they make contact at thousands of points in each unit. During the brazing process the plates are joined by the braze material at all of these points. This produces a heat exchanger of substantial strength. The benefit is added durability along with higher operating pressures and temperatures.

Product Description

API Schmidt-Bretten brazed plate heat exchangers consist of as many as 150 pattern-embossed stainless steel plates. The plates are brazed together, with every second plate turned 180 degrees to create flow channels with two mediums in counter-current direction.

The design of the plates creates a high turbulence resulting in outstanding heat transfer. The result is a highly efficient heat exchanger that utilizes all the material in the heat transfer process.

Lower Liquid Volume

Since the gap between the heat transfer plates is relatively small, a brazed plate heat exchanger contains only low quantities of process fluids. The benefit to you is reduced cost due to lower volume requirements for often costly refrigerants, coolants or process fluids.

Since the product remains in the heat exchanger for a short period of time, the process can be easily stopped or the temperature can be changed quickly with minimum impact on the product.



Compact with High Efficiency

The heat transfer plates in a brazed plate heat exchanger are die formed into a corrugated pattern. When the fluids flow through the heat exchanger across this pattern they are forced into a highly turbulent flow, which produces high heat transfer coefficients resulting in less surface area required and a smaller heat exchanger.

The result is a heat exchanger that is up to six times smaller than a comparable shell and tube exchanger for the same duty.

Low Capital Cost

The brazed plate heat exchanger is assembled from a very small number of machine formed parts. The amount of assembly and manufacturing time is significantly reduced which results in a much lower end user cost.

Highest Level of Quality

Most of the parts of the brazed plate heat exchanger are machine formed, thus providing the highest standard of product quality and performance.

From delivery of raw materials to installation of the finished product, careful checks are made on quality, compliance with specifications and dimensional tolerances.

Flexible Sizes Meet all Needs

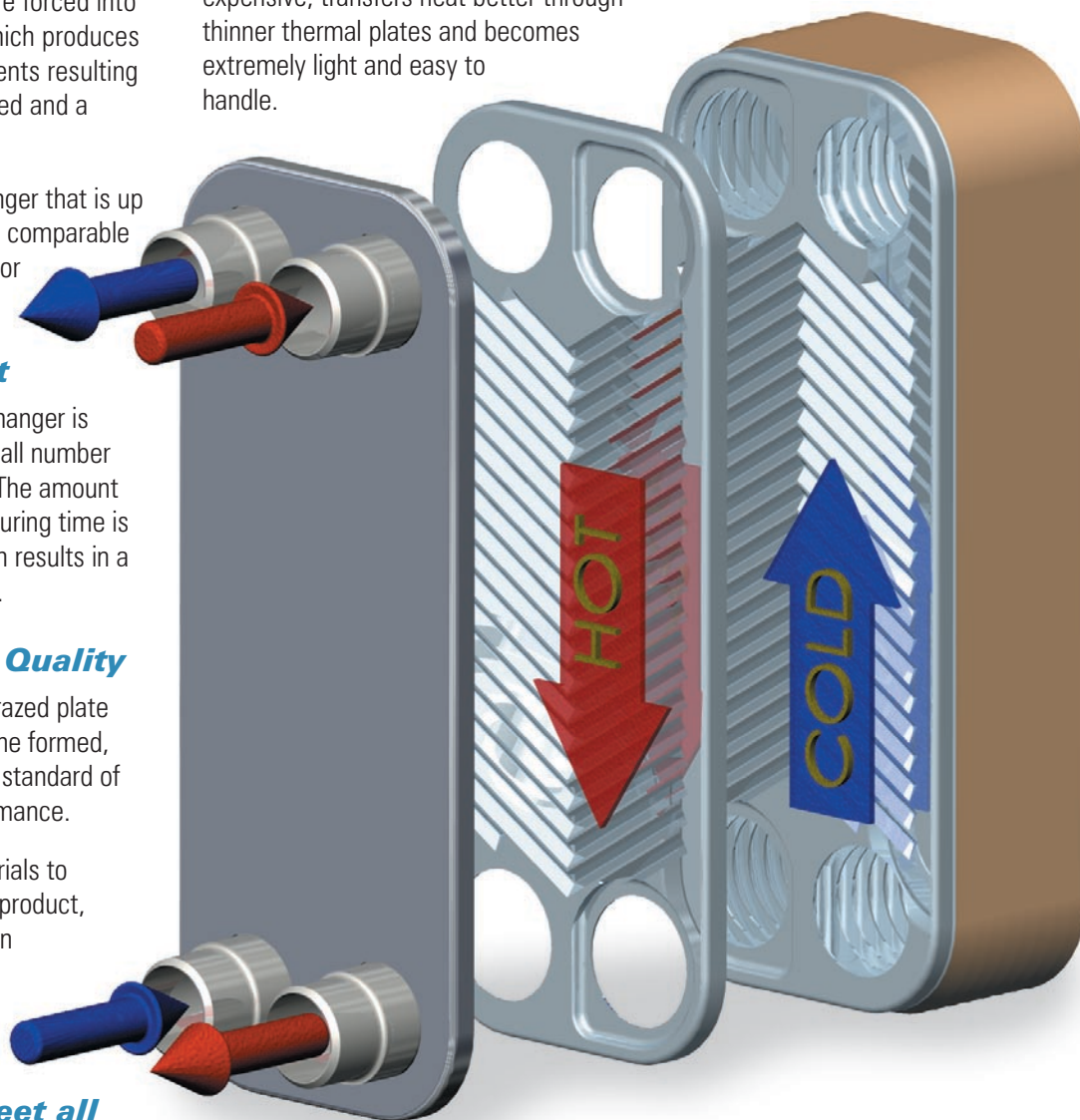
The demands of heat exchanger users vary tremendously from one to another. Some may use very viscous fluids while others may not.

To meet these varying demands API Schmidt-Bretten offers a wide range of sizes of brazed plate heat exchangers. We offer eleven different sizes with connections ranging from one half inch up to four inch.

Extremely Lightweight

The strength of the brazing process allows other components of the heat exchanger to be thinner while still retaining the same amount of pressure. In this manner the unit becomes less expensive, transfers heat better through thinner thermal plates and becomes extremely light and easy to handle.

Brazed plate heat exchangers feature corrugated stainless steel plates that produce highly turbulent counter-current flow. The result is high heat transfer rates and unmatched efficiency.



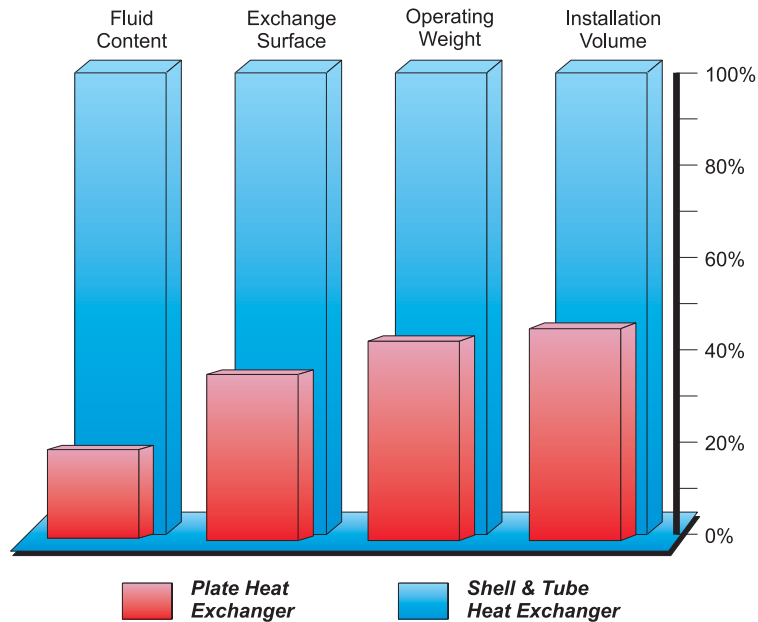
Superior Corrosion Resistance

The brazed plate heat exchanger is constructed entirely of corrosion resistant materials. The heat transfer plates and the connections are made from highly resistant 316SS. The standard braze material for joining the unit together is copper but for such applications as ammonia or de-ionized water nickel braze material may be used. The result is many years of dependable service.

Minimal Fouling Effects

Fouling of the heat transfer surfaces of brazed plate heat exchangers is extraordinarily low. This is a result of good product distribution, constant velocity profile and smooth plate surfaces. The high induced turbulence yields a self-cleaning effect which prevents fouling.

Brazed Plate-vs-Shell & Tube Heat Exchangers



The Schmidt brazed plate heat exchanger offers everything you ever wanted in a heat exchanger...and more.

- Lower energy and installation costs.
- Space and construction cost savings.
- Heavy duty construction.
- Superior corrosion resistance.
- Low fouling.
- Low fluid volumetric hold-up within unit.
- Highly efficient heat transfer in a compact design.

Take advantage of these benefits in applications such as:

- Engine lube oil cooling
- Hydraulic oil cooling
- Heat recovery
- Engine jacket cooling
- Refrigerant evaporating
- Refrigerant condensing
- Heat pumps
- Industrial processes
- Boilers
- Hot water converters
- Steam condensers
- District heating
- Steam condensers
- Domestic water heating
- Heating systems

Manufacturing Capabilities

API Heat Transfer's line of Schmidt brazed plate heat exchangers are manufactured in ultra-modern facilities. The brazing ovens feature sophisticated controls that assure even heating at the correct brazing temperature for the materials selected.

Assembly robots stack plates and locate connections correctly. Each finished model is tested to assure leak free performance.



Materials and Capacities



Materials of Construction

Thermal Plates 316 Stainless Steel
 Cover Plates 316 Stainless Steel
 Connections 316 Stainless Steel
 Braze Material Copper
 Optional Nickel

Capacities

MODEL	GPM
SB1	20
SB2	20
SB22	20
SB24	50
SB3	50
SB4	50
SB5	50
SB7	175
SB8	385
SB9	385
SB10	385

Operating Conditions

Maximum Pressure
 Copper Braze 450 Psi
 Nickel Braze 230 Psi
 Maximum Temperature 365°F
 Minimum Temperature -148°F

Maximum Connection Size

MODEL	SIZE
SB1	3/4"
SB2	1"
SB22	1"
SB24	1"
SB3	1"
SB4	1"
SB5	1"
SB7	2"
SB8	3"
SB9	4"
SB10	4"

Connection Types

Standard NPT, Soldering
 Optional SAE type, Flanged

Optional Features

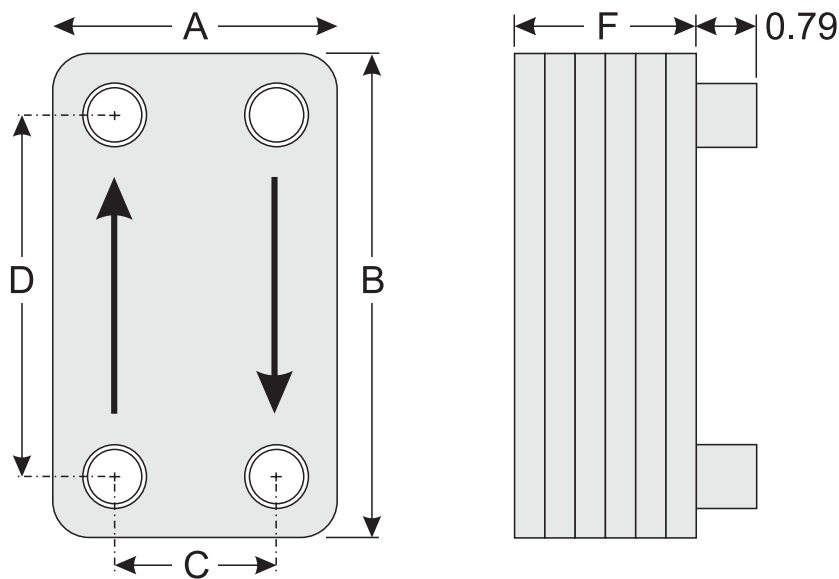
FEATURE	MODEL
Copper Braze	SB
Nickel Braze	SBN
Wide Gap Plate	SBG
Refrigerant Distributor	SBE
Double Wall Construction	SBD
Mounting Studs	Any Model

Approvals

ISO 9001
 ASME Code Stamp



Brazed Plate Heat Exchangers Dimensions



Schmidt Model Type	Dimensions in Inches (millimeters)					Max Number of Plates	Surface per Plate sq. ft. (sq. m.)	Max Flow gpm (m³/h)	Weight Empty lbs (KG)
	A	B	C	D	F				
SB1, SBN1	2.88 (73)	8 (203)	1.63 (40)	6.56 (170)	$0.47 + (.09 \times N)$ $(7 + (2.3 \times N))$	50	.13 (.012)	20 (4.5)	$1.65 + (.11 \times N)$ $(.75 + (.05 \times N))$
SB2, SBN2	3.5 (89)	9.06 (230)	1.69 (43)	7.19 (182)	$0.47 + (.09 \times N)$ $(7 + (2.3 \times N))$	50	.15 (.014)	20 (4.5)	$2.42 + (.13 \times N)$ $(1.3 + (.08 \times N))$
SB22, SBN22	3.5 (89)	12.8 (325)	1.69 (43)	10.98 (279)	$0.47 + (.09 \times N)$ $(7 + (2.3 \times N))$	50	.24 (.022)	20 (4.5)	$3.14 + (.18 \times N)$ $(1.3 + (.08 \times N))$
SB24, SBN24	3.5 (89)	18.15 (461)	1.69 (43)	16.34 (415)	$0.47 + (.095 \times N)$ $(7 + (2.4 \times N))$	50	.37 (.033)	20 (4.5)	$4.2 + (.33 \times N)$ $(1.7 + (.15 \times N))$
SBG24	3.5 (89)	18.15 (461)	1.69 (43)	16.34 (415)	$0.47 + (.112 \times N)$ $(7 + (2.9 \times N))$	50	.37 (.033)	20 (4.5)	$4.2 + (.33 \times N)$ $(1.7 + (.15 \times N))$
SB3, SBN3	4.88 (124)	6.73 (171)	2.88 (73)	4.72 (120)	$0.47 + (.09 \times N)$ $(7 + (2.3 \times N))$	50	.16 (.015)	50 (11)	$2.64 + (.13 \times N)$ $(1.2 + (.06 \times N))$
SB4, SBE4, SBN4	4.88 (124)	13.07 (332)	2.88 (73)	11.06 (281)	$0.47 + (.09 \times N)$ $(7 + (2.3 \times N))$	100	.32 (.03)	50 (11)	$3.52 + (.26 \times N)$ $(1.6 + (.12 \times N))$
SB5, SBE5, SBN5, SBD5	4.88 (124)	20.83 (529)	2.88 (73)	18.81 (478)	$0.47 + (.09 \times N)$ $(7 + (2.3 \times N))$	100	.53 (.049)	50 (11)	$4.4 + (.53 \times N)$ $(2.0 + (.24 \times N))$
SB7, SBE7	10.59 (269)	20.83 (529)	7.88 (200)	18.13 (460)	$0.47 + (.09 \times N)$ $(7 + (2.3 \times N))$	200	1.46 (.136)	175 (40)	$12.1 + (1.32 \times N)$ $(5.5 + (.6 \times N))$
SB8, SBE8	10.59 (269)	20.83 (529)	6.34 (161)	16.57 (421)	$0.88 + (.09 \times N)$ $(7 + (2.3 \times N))$	200	1.29 (.120)	385 (88)	$12.1 + (1.32 \times N)$ $(5.5 + (.6 \times N))$
SB9, SBE9	10.59 (269)	31.41 (798)	6.34 (161)	27.16 (690)	$0.47 + (.095 \times N)$ $(7 + (2.4 \times N))$	200	2.15 (.20)	385 (88)	$23.15 + (1.76 \times N)$ $(10.5 + (.8 \times N))$
SB10, SBE10	15.08 (383)	34.25 (870)	9.33 (237)	28.46 (723)	$0.88 + (.095 \times N)$ $(13 + (2.4 \times N))$	200	2.69 (.25)	385 (88)	$86.90 + (2.66 \times N)$ $(39 + (1.2 \times N))$

*N=Number of Plates

Brazed Plate Evaporators and Condensers

Schmidt brazed plate heat exchangers are highly efficient in refrigerant service. Their small size, low refrigerant charge and superior efficiency makes them ideal as evaporators, condensers and subcoolers. Standard models are stocked to 30 tons of capacity. Special order models are available for virtually any duty.

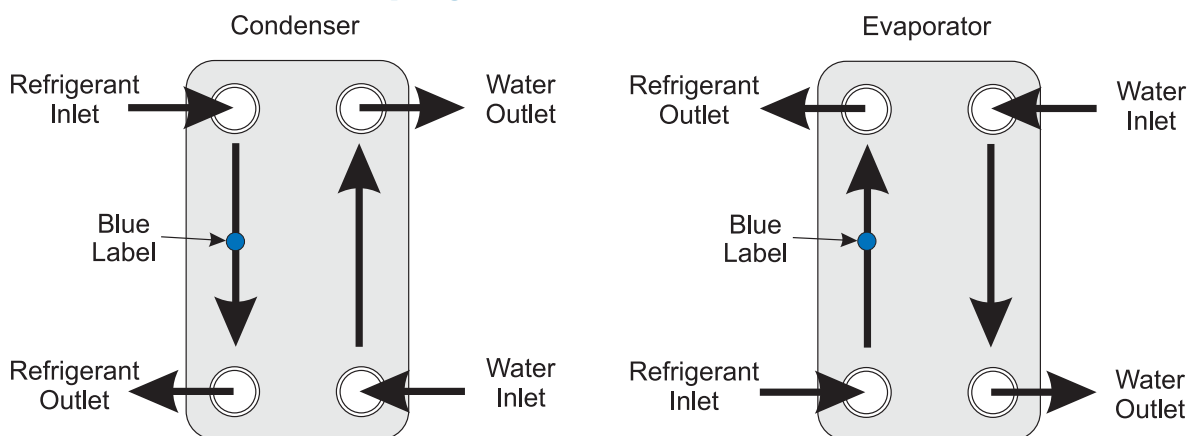
Brazed plate heat exchangers are available with copper brazing materials for use with halocarbon based refrigerants such as R-22 and R-404a. Models with nickel brazing materials are available for use with ammonia.

Evaporator models above a certain number of plates include an internal

refrigerant distribution feature to assure proper distribution of refrigerant gas and maximize the efficiency of the unit. This also assures proper superheat.

Their compact size makes them easy to package into small tonnage refrigeration systems, saving time, space and money.

Evaporator and Condenser Piping



EVAPORATORS						CONDENSERS					
Model Number	Nominal Tons	Ref. Conn.	Water Conn.	Depth In.	Weight lbs.	Model Number	Nominal Tons	Ref. Conn.	Water Conn.	Depth In.	Weight lbs.
SB22-8	.5	5/8	7/8	1.2	4	SB22-8	.5	5/8	7/8	1.2	4
SB22-10	0.8	5/8	7/8	1.4	5	SB22-10	0.8	5/8	7/8	1.4	5
SB22-14	1.0	5/8	7/8	1.8	5	SB22-14	1.0	5/8	7/8	1.8	5
SB22-20	1.5	5/8	1-1/4	2.4	6	SB22-20	1.0	5/8	7/8	2.4	6
SB22-20	2.0	5/8	7/8	2.4	6	SB22-24	2.0	5/8	7/8	2.8	7
SB22-24	2.5	5/8	7/8	2.8	7	SB22-30	2.5	5/8	7/8	3.3	8
SB4-20	3.0	7/8	1-1/4	2.4	9	SB4-24	2.5	7/8	1-1/4	2.8	10
SB4-24	3.5	7/8	1-1/4	2.8	10	SB4-24	3.5	7/8	1-1/4	2.8	10
SB5-20	4.0	7/8	1-3/8	2.4	15	SB5-20	4.0	7/8	1-3/8	2.4	15
SB5-24	5.0	7/8	1-3/8	2.8	17	SB5-20	5.0	7/8	1-3/8	2.4	15
SB5-30	6.0	1-3/8	1-3/8	3.3	20	SB5-24	6.0	7/8	1-3/8	2.8	17
SB5-34	7.5	1-3/8	1-3/8	3.7	22	SB5-30	7.5	1-3/8	1-3/8	3.3	20
SB5-44	10.0	1-3/8	1-3/8	4.6	28	SB5-40	10.0	1-3/8	1-3/8	4.3	26
SB5E-70	15.0	1-3/8	1-3/8	7.1	41	SB5-70	15.0	1-3/8	1-3/8	7.1	41
SB5D-100	20.0	1-3/8	1-3/8	9.9	57	SB5-80	20.0	1-3/8	1-3/8	8.0	47
SB7M-50	25.0	2-1/8	2-1/8	5.2	78	SB5-100	25.0	1-3/8	1-3/8	9.9	57
SB7M-60	30.0	2-1/8	2-1/8	6.1	91	SB7M-50	30.0	2-1/8	2-1/8	5.2	78
SBE7M-100	40.0	1-5/8	2	9.47	144	SB7-70	40.0	1-5/8	2	6.77	104
SBE7M-120	50.0	1-5/8	2	11.27	170	SB7-90	50.0	1-5/8	2	4.97	130
SBE9-100	60.0	2-5/8	2	9.97	200	SB7-120	60.0	1-5/8	2	11.27	170
SBE9-130	75.0	2-5/8	2	12.82	252	SB9-130	75.0	2-5/8	2	12.82	252
SBE9-180	100.0	2-5/8	2	17.57	340	SB9-200	100.0	2-5/8	2	19.47	375

Evaporator performance based on cooling water at 2.4 GPM per ton from 54°F to 44°F in R-22 service at 35°F SST and 6°F superheat. Condenser performance based on R-22 service at 105°F condensing temperature and using 3 GPM per ton of cooling water at 85°F.

API Heat Transfer

API Heat Transfer Inc.
2777 Walden Avenue
Buffalo, New York 14225
(716) 684-6700
www.apiheattransfer.com

Divisions:

API Airtech ISO-9001 Certified

Air Cooled Aluminum Heat Exchangers
91 North Street • P.O. Box 68
Arcade, New York 14009-0068
(585) 496-5755 • Fax: (585) 496-5776

API Basco ISO-9001 Certified

Basco®/Whitlock® Shell & Tube Heat Exchangers
2777 Walden Avenue
Buffalo, New York 14225
(716) 684-6700 • Fax: (716) 684-2129

API Schmidt-Bretten Americas

Plate Heat Exchangers and Thermal Systems
2777 Walden Avenue
Buffalo, New York 14225
(716) 684-6700 • Fax: (716) 684-2129

API Schmidt-Bretten GmbH & Co. KG

ISO-9001 Certified
Plate Heat Exchangers and Thermal Systems
Langenmorgen 4
D-75015 Bretten, Germany
(49)725253-0 • Fax: (49)725253-200

API Heat Transfer (Suzhou) Co., Ltd.

Air Cooled Aluminum Heat Exchangers
Shell & Tube Heat Exchangers
Plate Heat Exchangers
156 Qingqiu Street, 3rd District
Suzhou Industrial Park
Suzhou, Jiangsu 215126 China
(86)512-88168000 • Fax: (86)512-88168003

**Contact your local API Sales Representative
or API Heat Transfer directly**
toll-free: 1-877-API-HEAT
e-mail: sales@apiheattransfer.com

Other Products Available from API Heat Transfer

SigmaWig Welded Plate Heat Exchangers



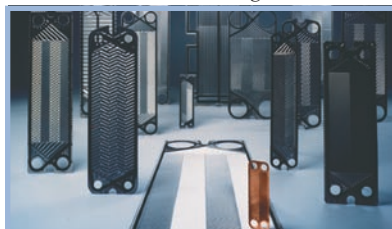
Fully welded and require no gaskets. Available in all 316SS construction, titanium and other higher alloy materials. These units have a design temperature of 750°F and can handle operating pressures as high as 360 psi with an ASME Code stamp.

Semi-Welded Plate Heat Exchangers



Combines the high thermal efficiency, compact design, and low volumetric liquid hold-up of a plate heat exchanger with the leak prevention of a shell & tube. Ideal for ammonia applications.

Gasketed Plate Heat Exchangers



The Schmidt line of gasketed plate & frame heat exchangers provide excellent heat transfer in a compact space. Plates are pressed from stainless steel, titanium and other alloys. Gaskets of nitrile, EPDM, Viton®, compressed fiber and Teflon® are used. Capacities range from 0.5 to 10,000 GPM.

SigmaStar® Evaporator Systems



Utilizing the SigmaStar® plate, this evaporator system is designed to remove water or other solvents, while concentrating solutions. SigmaStar® Systems can be pre-assembled and pre-tested prior to shipment for quick and easy start up.

Type 500 Shell and Tube Heat Exchangers



General purpose exchangers designed to cool oil, compressed air and other industrial fluids. A variety of constructions, port configurations and materials are available. ASME and TEMA-C available. Diameters from 3" (7.62 cm) to 12" (30.48 cm).

Hubbed Shell and Tube Heat Exchangers



Straight or U-tube, fixed or removable tubesheet general purpose exchangers designed to cool oil, water, compressed air and other industrial fluids. A variety of port configurations and materials are available. Diameters from 3" (7.62 cm) to 12" (30.48 cm).

TEMA Shell and Tube



A wide variety of TEMA types are available using pre-engineered or custom designs in various sizes and materials. Shell diameters from 6" (15.24 cm) to 60" (152.4 cm), ASME, TEMA, API, ABS, TUV, ISPEL and other code constructions available.

Air-Cooled Heat Exchangers



High efficiency, brazed aluminum coolers for cooling a wide variety of liquids and gases with ambient air. Lightweight, yet rugged. Capable of cooling multiple fluids in single unit. Models can be supplied with cooling fan and a variety of drives.