

**SCHMIDT-BRETTEN  
BRAZED PLATE  
HEAT EXCHANGERS**



**API Heat Transfer**

*...world leaders in heat transfer technology*

# API Schmidt-Bretten over a century of experience in heat transfer advancement.

*With thousands of  
installed units worldwide,  
API Schmidt-Bretten brazed-  
plate heat exchangers are  
known as highly reliable for:*

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

## World leaders in Heat Transfer Technology

*API Heat Transfer has grown to become North America's foremost 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 source 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 in to a bold new technology that offers significant benefits.

The critical parameter for any heat exchanger is the amount of surface area it requires 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.



### 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.



## Experience, Innovation and Reliability.

### Compact with High Efficiency

The heat transfer plates in a brazed plate heat exchanger are die formed in to a corrugated pattern. When the fluids flow through the heat exchanger across this pattern they are forced in to 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

Inasmuch as most of the parts of the brazed plate heat exchanger are machine formed, the highest standard of product quality and performance is easily met.

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

### Flexible Sizes Meet all Needs

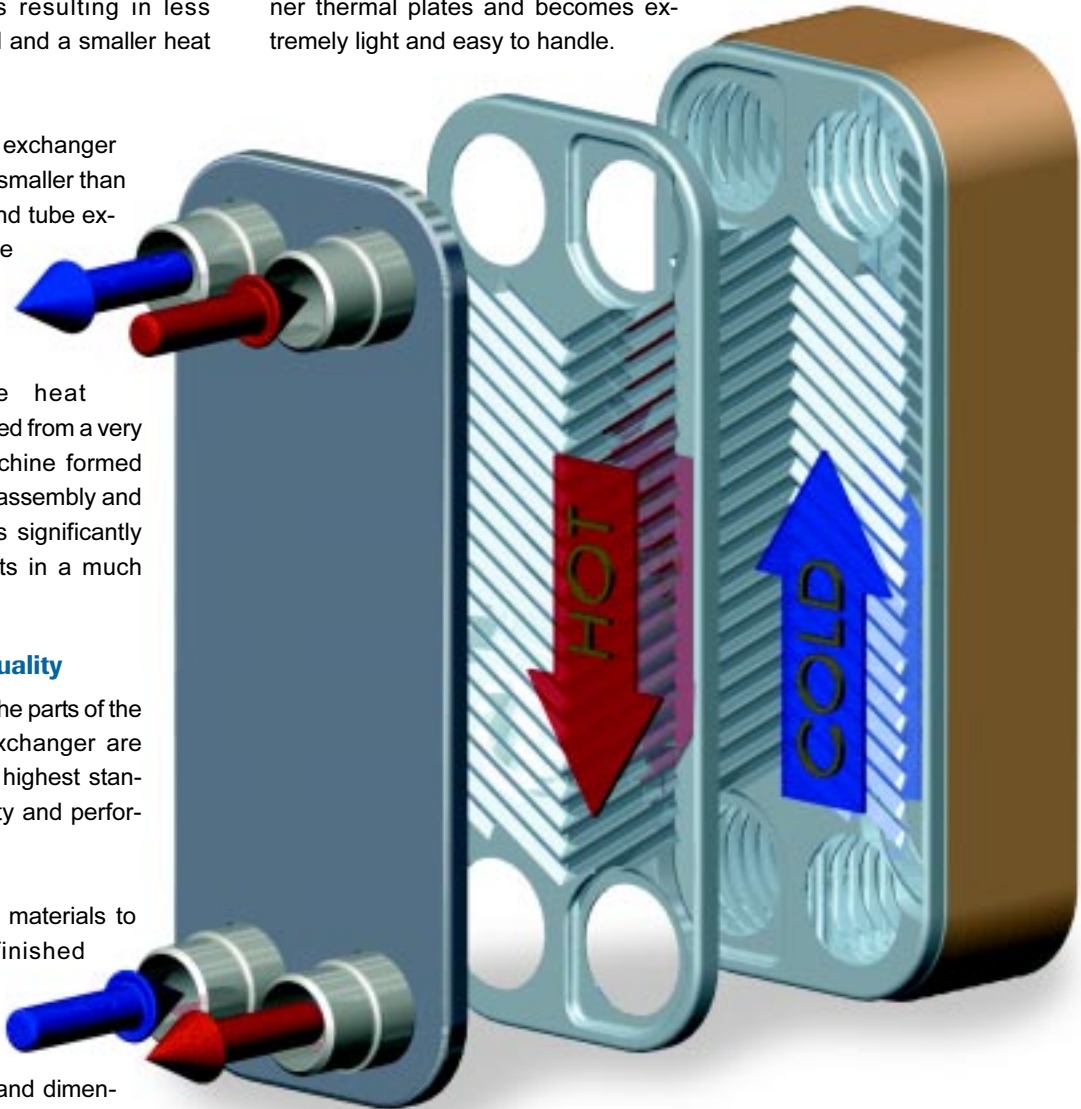
The demands of heat exchanger users vary tremendously from one to another. Some may use very viscous fluids while others may not.

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

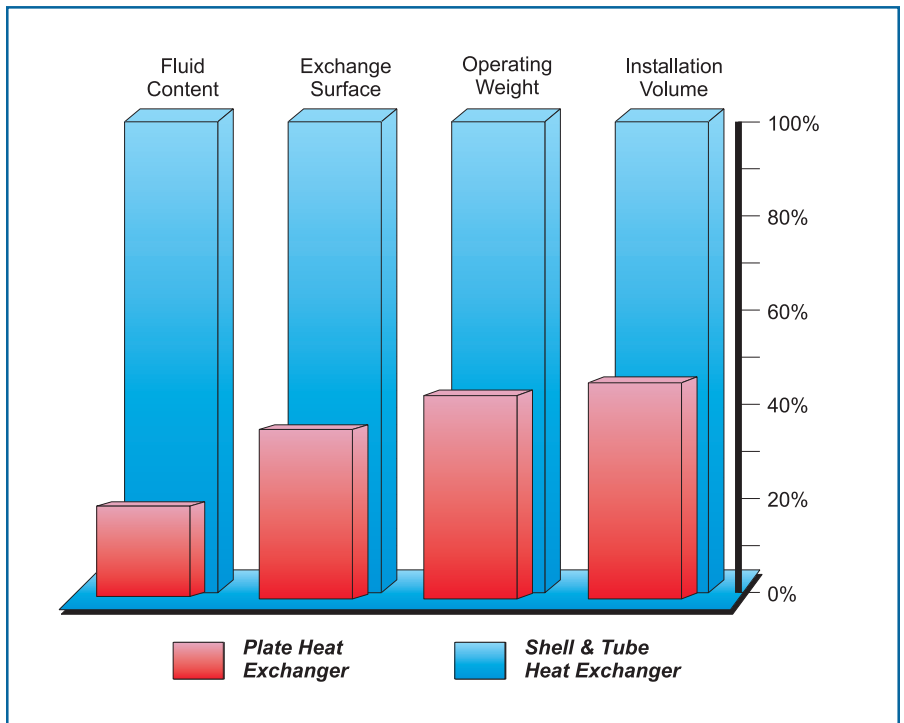
### Minimal Fouling Effects

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.

## The API Schmidt-Bretten 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.*
- *Highest quality and repeatability.*
- *Superior corrosion resistance*
- *Low fouling.*

## Brazed Plate -vs- Shell & Tube Heat Exchangers



Take advantage of these features 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**

### Manufacturing Capabilities

API Schmidt-Bretten SB 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.



# API Heat Transfer

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 other plate turned 180° to create flow channels with two mediums in counter-current direction. The design of the plates creates a high fluid turbulence resulting in outstanding heat transfer rates. The result is a highly efficient heat exchanger that utilizes all of the material in the heat transfer process.



## Materials of Construction

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

## Operating Conditions

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

## Connection Types

Standard .....	NPT Soldering
Optional .....	SAE type Flanged

## Capacities

Model	GPM
SB1 .....	20
SB2 .....	20
SB3 .....	20
SB22 .....	20
SB3 .....	50
SB4 .....	50
SB5 .....	50
SB7 .....	175
SB8 .....	385

## Maximum Connection Size

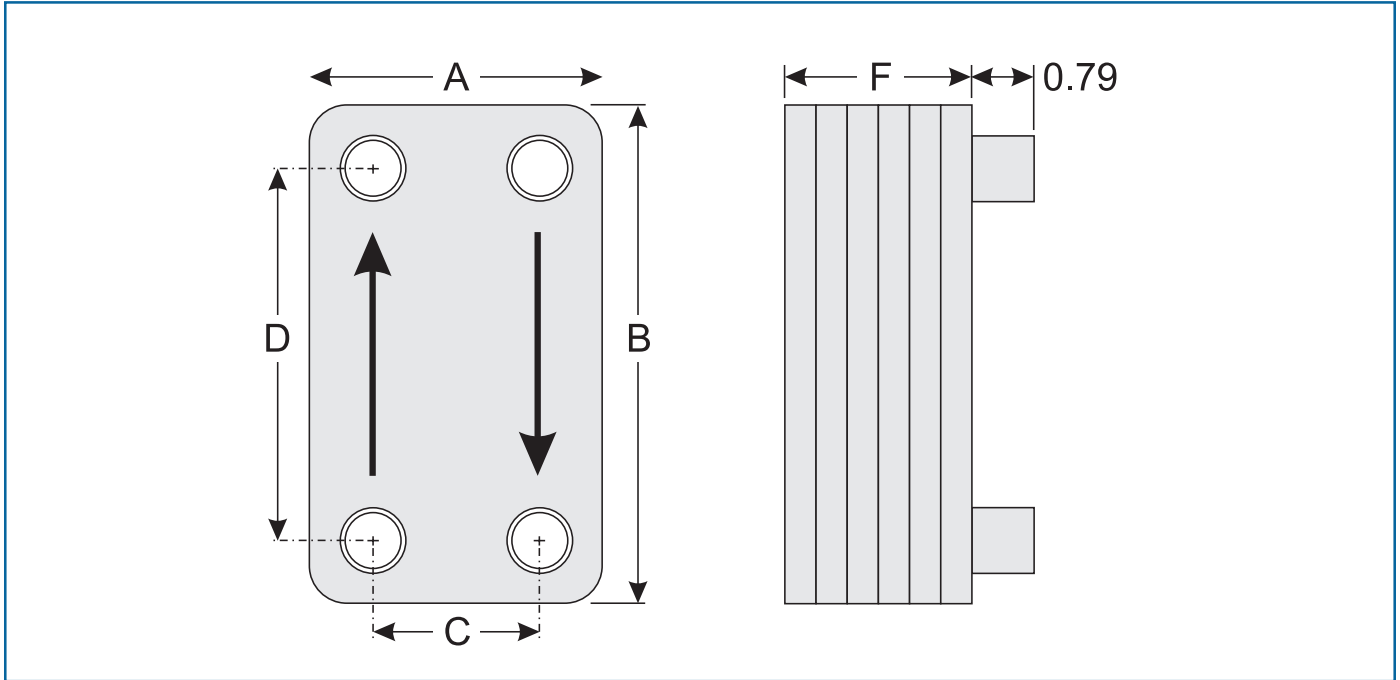
Model	Size
SB1 .....	3/4"
SB2 .....	1"
SB3 .....	1"
SB22 .....	1"
SB3 .....	1"
SB4 .....	1"
SB5 .....	1"
SB7 .....	2"
SB8 .....	3"

## Approvals



**ASME Code Stamp available on selected models**

## Schmidt-Bretten Brazed Plate Heat Exchangers Dimensions



API Model Type	Dimensions in Inches					Max Number of Plates	Surface per Plate (sq. ft.)	Max Flow (gpm)	Weight Empty (lbs)
	A	B	C	D	F				
SB1	2.88	8	1.63	6.56	.013+ (.09 x N)	30	.13	20	1.65+ (.11xN)
SB2	3.5	9.06	1.69	7.19	.013+ (.09 x N)	50	.15	20	2.42+ (.13xN)
SB22	3.5	12.8	1.69	10.98	.013+ (.09 x N)	30	.24	20	3.14+ (.18xN)
SB3	4.88	6.73	2.88	4.72	.013+ (.09 x N)	50	.16	50	2.64+ (.13xN)
SB4	4.88	13.07	2.88	11.06	.013+ (.09 x N)	100	.32	50	3.52+ (.26xN)
SB5	4.88	20.83	2.88	18.81	.013+ (.09 x N)	100	.53	50	4.4+ (.53xN)
SB7	10.59	20.83	7.88	18.13	.013+ (.09 x N)	150	1.46	175	12.1+ (1.32xN)
SB8	10.59	20.83	6.34	16.57	.013+ (.09 x N)	150	1.29	385	12.1+ (1.32xN)

API Model Type	Dimensions in Millimeters					Max Number of Plates	Surface per Plate (sq. m.)	Max Flow (m³/h)	Weight Empty (Kg)
	A	B	C	D	F				
SB1	73	203	40	170	7+(2.3xN)	30	.012	4.5	.75+ (.05xN)
SB2	89	230	43	182	7+(2.3xN)	50	.014	4.5	1.3+ (.08xN)
SB22	89	325	43	279	7+(2.3xN)	30	.022	4.5	1.3+ (.08xN)
SB3	124	171	73	120	7+(2.3xN)	50	.015	11	1.2+ (.06xN)
SB4	124	332	73	281	7+(2.3xN)	100	.03	11	1.6+ (.12xN)
SB5	124	529	73	478	7+(2.3xN)	100	.049	11	2.0+ (.24xN)
SB7	269	529	200	460	7+(2.3xN)	150	.136	40	5.5+ (.6xN)
SB8	269	529	161	421	7+(2.3 x N)	150	.120	88	5.5+ (.6xN)

## Brazed Plate Evaporators and Condensers

API Schmidt-Bretten 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.

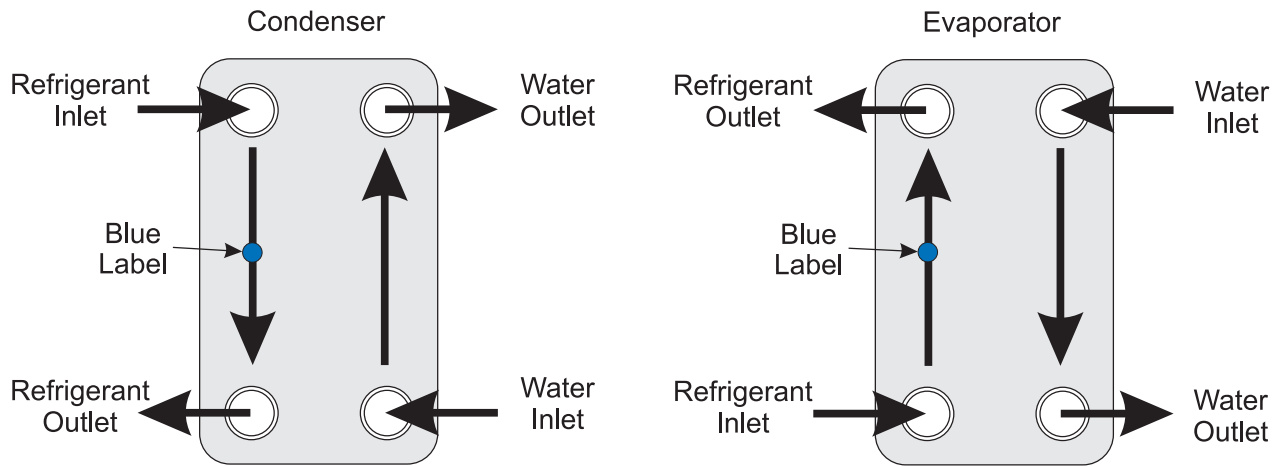
Brazed plate heat exchangers are available with copper brazing materials for use with halocarbon based refrigerants such as R-22 and R-404a. Models with nickel brazing materials are available for use with ammonia.

Evaporator models above a certain number of plates include in-

ternal refrigerant distribution features 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 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
SB5D-60	12.5	1-3/8	1-3/8	6.1	36	SB5-50	12.5	1-3/8	1-3/8	4.6	31
SB5D-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

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

*American Precision  
Industries, Inc.*

**API Airtech Inc.** ISO-9001 Certified

*Air Cooled Aluminum Heat Exchangers*

91 North Street • P.O. Box 68

Arcade, New York 14009-0068

(716) 496-5755 • Fax: (716) 496-5776

**API Basco Inc.** ISO-9001 Certified

*Basco/Whitlock Shell & Tube Heat Exchangers*

2777 Walden Avenue

Buffalo, New York 14225

(716) 684-6700 • Fax: (716) 684-2129

**API Ketema Inc.**

*Basco/Whitlock Shell & Tube Heat Exchangers*

*Acme® Refrigeration Equipment*

2300 West Marshall Drive

Grand Prairie, Texas 75051

(972) 647-2626 • Fax: (972) 641-1518

**API Schmidt-Bretten Inc.**

*Plate Heat Exchangers*

2777 Walden Avenue

Buffalo, New York 14225

(716) 684-6700 • Fax: (716) 684-2129

**API Schmidt-Bretten GmbH.**

ISO-9001 Certified

*Plate Heat Exchangers*

P.O. Box 1580 D-75005 Bretten

Pforzheimer Strasse 46

D-75015 Bretten, Germany

7252/53-101 • Fax: 7252/53-201

**Call your local API Sales Representative or  
API directly toll-free at 1-877-API HEAT.**

**Visit us at [www.apiheattransfer.com](http://www.apiheattransfer.com)**

## Other Products Available from API Heat Transfer

*OptiDesign®*



Straight-tube, removable bundle exchangers made from standard components. Floating tube sheet for seal leak detection and easy maintenance. Diameters from 3" (7.62 cm) to 42" (106.68 cm). ASME, API, TEMA, ABS and other codes available.

*Pipeline Aftercoolers*



Straight tube, counterflow aftercoolers designed to yield cool, dry compressed air. Available with or without accompanying moisture separators and constructed to a wide variety of design codes. Diameters from 6" (15.24 cm) to 42" (106.68 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, ISPESEL and other code constructions available.

*Refrigerant Evaporators & Condensers*



Off-the-shelf, standard units reflect the latest in heat exchanger technology for maximum performance and low cost. Ideal for OEM or aftermarket applications. Numerous design and material options are available. Tonnage capacity ranges from 5 to over 400 tons.

*Extended Surface*



Unique, patented plate-fin design for centrifugal or axial compressor intercooler and aftercooler applications and minimal pressure loss. Design eliminates separators. ASME code design is standard. Diameters from 20" (50.8 cm) to 120" (304.8 cm).

*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.

*Plate Heat Exchangers*



Compact units provide excellent heat transfer and small size. Plates are pressed from stainless steel, titanium and other alloys. Gaskets of nitrile, EPDM, Viton®, compressed fiber and Teflon® are used. Gasket-free welded and brazed designs available.

*ACME® Packaged Chillers*



Packaged chillers with or without pumping systems from 3 to over 400 tons with PLC controls available. Standard and custom designed chiller-barrels and condensers to 2,500 tons with same-day shipment on many units. DX and flooded evaporators available.