

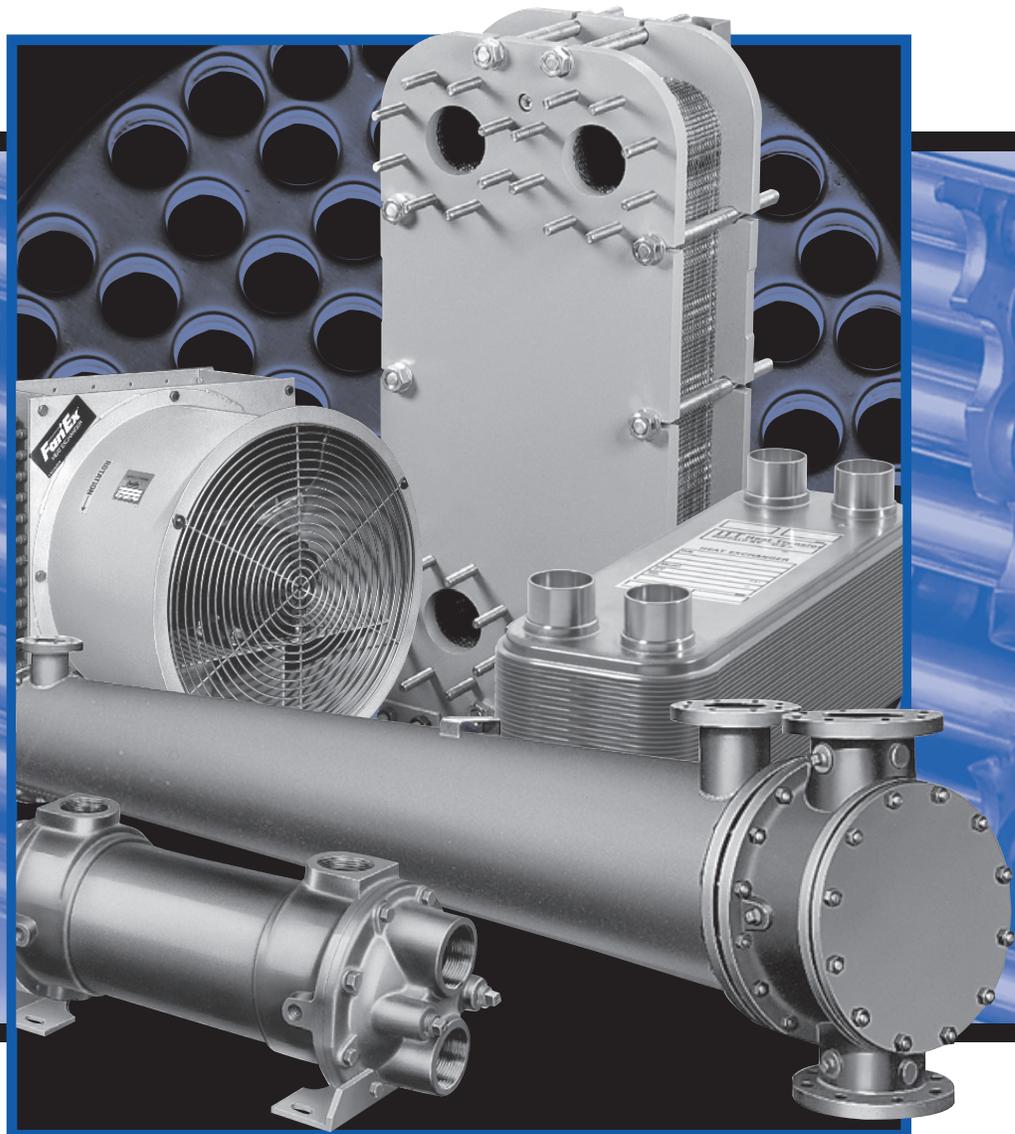


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ITT Standard

the new
standard in | **Heat Transfer Equipment**

The Broadest Selection Available For General Heating And Cooling.



Engineered for life

Shell-and-Tube HEAT Exchangers

for general applications

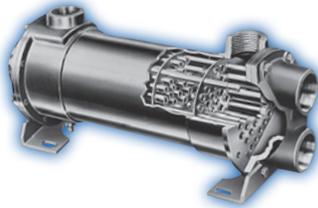


BCF/HCF®

Pre-engineered, fixed-tubesheet in 55 designs available from stock. Up to four passes, covering areas as large as 124 square feet. Corrosion-resistant copper alloy core and rugged cast-iron bonnets.

Applications: To heat or cool water or lube oil; condense steam. Use for auxiliary machinery, turbines, engines, compressors and lasers.

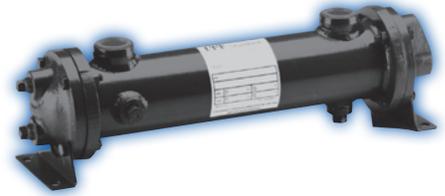
Excellent choice for pilot plants.



SSCF®

Pre-engineered with all fluid contact parts of stainless steel. Assembled from stocked components. 1-, 2- or 4-pass models, with heat transfer surfaces from 1.2 to 576 square feet. Tube side of 316 stainless steel, with option of cast iron, cast bronze or cast stainless steel bonnets. ASME code construction available.

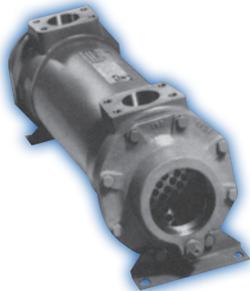
Applications: For heating or cooling corrosive fluids in chemical, pharmaceutical or refining processes.



SX2000®

Steel shell tubesheet with cast-iron bonnets. Up to four passes, surface to 124 square feet. Options include copper/nickel or stainless tubes, special lengths, baffle spacing, nozzles.

Applications: To cool lube oil, fluids or jacket water, and for use where copper is not practical.



HFF®

Adapted from the BCF model, with the addition of S.A.E. flange connections. Assembled from stock components with 5", 6" or 8" shell diameters.

Applications: For use where S.A.E. bolting on the oil or shell side is required.



B300/SX2000U

Economical, all steel, standard U-tube construction with removable bundles and copper tubes. 2-, 4- and 6-pass models in 4" to 29" diameters. Meets ASME code.

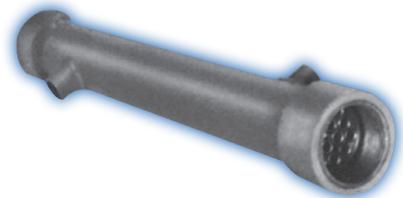
Applications: For heating water or other fluids, using steam or hot water as the heating medium.



B200

Straight tube, fixed tubesheet construction with cast-iron head design. Competitively priced. Non-TEMA design. Available in shell diameters of 6" to 19". Meets ASME code.

Applications: For heating water or other fluids, using steam or hot water as the heating medium



EF®

Sample cooler available in carbon steel or 316 stainless steel. All-welded construction. Shell side pressures are 800 or 1000 PSIG; tube side design pressure is 1000 PSIG.

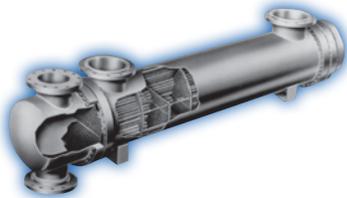
Applications: For cooling chemical samples to permit handling (either by equipment or personnel) for quantitative product analyses.



We'll be happy to customize a heat exchanger design to meet the precise needs of your application.

Engineered for life

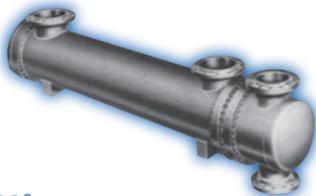
Custom Shell-and-Tube HEAT Exchangers for process applications



C100®

External packed floating head allows differential thermal expansion between shell and tubes. No packing is exposed to tube side fluid. Large entrance area enables easier maintenance of removable tube bundle. 1-, 2-, 4- or 6-pass models. Meets ASME code and TEMA Types BEP/AEP.

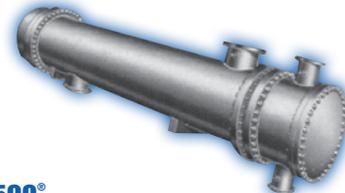
Applications: For tube side circulation of corrosive liquids, high-fouling fluids, or gases and vapors.



C400®

Straight tubes, internal bolted floating head cover, removable tube bundle. No special provisions needed for expansion. Meets ASME code and TEMA Types BET/AET.

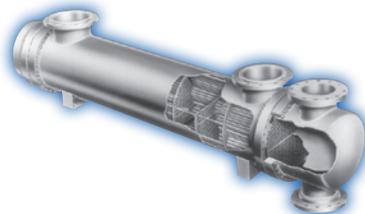
Applications: For heating or cooling chemical or hydrocarbon fluids; condensing air or gases.



C500®

Straight tubes, internal clamp-ring floating head cover. Tube bundle is removable for easy cleaning. Offers more surface per given shell and tube sizes than C400 or C100. Meets ASME code and TEMA Types BES/AES.

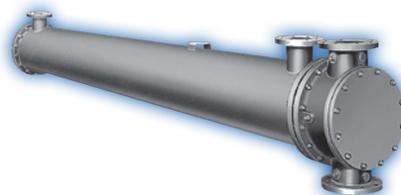
Applications: For the most rugged process plant service, including heating or cooling petrochemicals or condensing vapors.



C200®/C210

Fixed tubesheet with removable channel or bonnet. Maximum heat transfer area in a given shell size. Available with shell expansion joint if desired. 1-, 2- 4- or 6-pass models. Accessible tube side makes cleaning easier. Meets ASME code and TEMA Types BEM, AEL/NEN

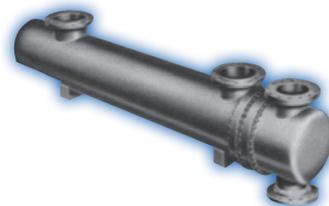
Applications: For heating or cooling oil, water and chemical process fluids.



CPK

Flexible design with packed floating tubesheet, removable tube bundle. Wide choice of materials, components, and nozzle orientations. Shell sizes: 5" through 31" (CPK). Meets ASME Code and TEMA.

Applications: Heat or cool electrolyte, condensate, brine, boiler blowdown or hydraulic, turbine, and compressor oils/fluids.



C300®, C320 and C330

U-type, removable-bundle design allows wide variation in fluid temperature, withstands thermal shock better. 2-, 4-, or 6-pass models. Most economical basic shell and tube configuration. Meets ASME code and TEMA Types BEU/AEU.

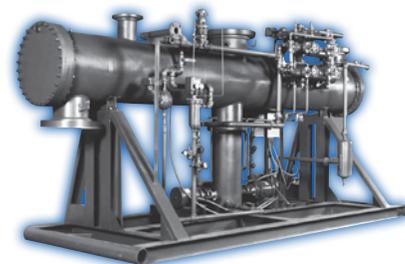
Applications: For heating or cooling oil, water and process fluids or condensing process steam or vapor.



A100®, A200®, A300®

Inline aftercooler with corrosion-resistant removable tube bundle. Available with moisture separator, in diameters from 2" through 13" and capacities from 150 to 8700 SCFM. Compact A200 features Amatran® inner fin tubes. A300 has space-saving Amaclean® inner fin tubes, making it compact, easy to clean. ASME code construction available on all.

Applications: A100 and A300: Cooling and drying compressed air or gases. A200: Cooling and drying air or gases with no oil carryover.



S1000® and S1000R®

Single-bank, balanced-flow packaged steam condensers. Low pressure drop over tubes and large entrance area to tube bank. Furnished with packaged air removal and/or other associated equipment.

Applications: For condensing steam from refrigeration machines, compressors, auxiliary generator drives, pump or blower drives.

Plate heat exchangers



Brazepak®

Vacuum-brazed, stacked plate construction is both lightweight and compact, offering advantages when package downsizing is required. One-sixth the size, one-fifth the weight of shell and tube exchangers. Available with a variety of options, including number of plates, passes and nozzle configurations.

Applications: For general purpose oil, water and gas cooling. Use on compressors, hydraulic packages, lasers and diesel engines. Ideal for refrigerant evaporators, condensers, chillers or air dryers.



PlateFlow™

Offers more cooling in less space. Up to 550 plates create heat transfer surface of as much as 10,900 square feet. Flows up to 4,000 gallons per minute. Special corrugated plates increase efficiency through turbulence. Plates available in 304 and 316 stainless; titanium; Incoloy® and Hastelloy®.

Applications: For close temperature control of fluids for heat recovery applications.

Air/Oil, Air/Air or Air/Water



AirEx™

Rugged, compact and lightweight for fast, easy installation. Models for air-cooling of lube oil, hydraulic fluids or various industrial oil cooling duties. Brazed aluminum bar and plate construction.

Applications: Oil cooling with air, where compact size and rugged construction are a must.



FanEx®

All FanEx heat exchangers have heavy duty direct drive fans, copper headers with brazed joints, and galvanized steel housings.

Air/Oil models feature exclusive, patented Amaspher® turbulence to mix oil for better cooling in less space. Twelve standard sizes, with oil flows from 2 to 180 gallons per minute.

Air/Air models are available in ten standard sizes, to cool from 20 to 760 SCFM of compressed air.

Air/Water models come in eight standard sizes, with water flow rates from 40 to 112 gallons per minute.

Applications: For cooling oil or other fluids with air, where compact size, cooling efficiency, safety and quiet operation are important.



Heavy Duty Heating Coils

Type H, HW1, HRC and HRP coils heat with steam, hot water or other fluids. Type HD1 coils heat with steam only. All are available in single or multi-row units with removable element assemblies.



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HEAT Exchanger Models

Model	Construction	Advantages
BCF, HCF, TCF, HFF, SX2000, C200, C210, S1000, SSCF, EF	Non-removable bundle, fixed tubesheet	<ol style="list-style-type: none"> 1. Less costly than removable bundle heat exchangers 2. Provides maximum heat transfer surface per given shell and tube size 3. Provides multi-tube pass arrangements 4. Interchangeable with competitive models
CPK, C100, A100, A200, A300, BCP	Removable bundle, packed floating tubesheet	<ol style="list-style-type: none"> 1. Floating end allows for differential thermal expansion between the shell and tubes 2. Shell side can be steam or mechanically cleaned 3. Bundle can be easily repaired or replaced 4. Less costly than full internal floating head-type construction 5. Maximum surface per given shell and tube size for removable bundle designs
C400	Removable bundle, pull-through bolted internal floating head cover	<ol style="list-style-type: none"> 1. Allows for differential thermal expansion between the shell and tubes 2. Bundle can be removed from shell for cleaning or repairing, without removing the floating head cover 3. Provides multi-tube pass arrangements 4. Provides large bundle entrance area 5. Excellent for handling flammable and/or toxic fluids
C500	Removable bundle, internal clamp ring-type floating head cover	<ol style="list-style-type: none"> 1. Allows for differential thermal expansion between the shell and tubes 2. Excellent for handling flammable and/or toxic fluids 3. Higher surface per given shell and tube size than C400 4. Provides multi-tube pass arrangements
C300, C320, C330, BCU, SSCU, B-300S, B-300W, SX2000U	Removable bundle, U-tube	<ol style="list-style-type: none"> 1. Less costly than floating head or packed floating tubesheet designs 2. Provides multi-tube pass arrangements 3. Allows for differential thermal expansion between the shell and tubes, as well as between individual tubes 4. High surface per given shell and tube size 5. Capable of withstanding thermal shock
FanEx	Plate fin core with fan	<ol style="list-style-type: none"> 1. Uses air for cooling where water is unavailable, costly or undesirable. Exhaust air can be used for space heating
AirEx	Bar and Plate with fan	<ol style="list-style-type: none"> 1. Uses air for cooling where water is unavailable, costly or undesirable. Exhaust air can be used for space heating
PlateFlow	Removable partition plates with compression endplates and frame	<ol style="list-style-type: none"> 1. Ease of disassembly for cleaning or replacement of plates
Brazepak	Brazed plate	<ol style="list-style-type: none"> 1. Very compact and rugged 2. Lightweight 3. Many design options, including multiple passes, different plate styles, nozzle sizes and orientation 4. High heat transfer performance 5. No gaskets
HD1, H, HW1, HRC, HRP	Heavy duty removable core type	<ol style="list-style-type: none"> 1. Tubes free to expand individually 2. Heating elements totally removable for maintenance or replacement without disconnecting outer casing from ductwork 3. Type HD1 provides maximum freeze-resistance when using sub-freezing air 4. Type HD1 has steam distributing tube for flow pressure operation with modulating control 5. Embedded or extruded fins available for higher design temperatures (750° F max.)

Use this guide and the following charts to determine the heat exchanger you need. We hope you will find these guidelines useful; for more information, or specific recommendations, call your local ITT representative. Or send for free copies of our fully-detailed catalogs covering each product.

Limitations	Selection Tips
<ol style="list-style-type: none"> 1. Shell side can be cleaned only by chemical means 2. No provision to correct for differential thermal expansion between the shell and tubes. (Exception: expansion joint, available only on C200 and C210 exchangers) 	<ol style="list-style-type: none"> 1. For lube oil and hydraulic oil coolers, put the oil through the shell side 2. Corrosive or high fouling fluids should be put through the tube side 3. In general, put the coldest fluid through the tube side
<ol style="list-style-type: none"> 1. Shell side fluids limited to non-volatile and/or non-toxic fluids, i.e., lube oils, hydraulic oils 2. Tube side arrangements limited to one or two passes 3. Tubes expand as a group, not individually (as in U-tube unit); therefore, sudden shocking should be avoided 4. Packing limits design pressure and temperature 	<ol style="list-style-type: none"> 1. For lube oil or hydraulic oil coolers, put the oil through the shell side 2. For air intercoolers and aftercoolers on compressors, put air through the tube side 3. Coolers with water through the tube side: clean or jacket water, use 3/8" tubes; raw water, use 5/8" or 3/4" tubes 4. Put hot shell side fluid through at stationary end (to keep temperature of packing as low as possible)
<ol style="list-style-type: none"> 1. For a given set of conditions, it is the most costly of all the basic types of heat exchanger designs 2. Less surface per given shell and tube size than C500 	<ol style="list-style-type: none"> 1. If possible, put the fluid with the lowest heat transfer coefficient through the shell side 2. If possible, put the fluid with the highest working pressure through the tube side 3. If possible, put the high fouling fluid through the tube side
<ol style="list-style-type: none"> 1. Shell cover, clamp-ring and floating head cover must be removed prior to removing the bundle. Results in higher maintenance cost than the C400 2. More costly than fixed tube sheet or U-tube heat exchanger designs 	<ol style="list-style-type: none"> 1. If possible, put the fluid with the lowest heat transfer coefficient through the shell side 2. If possible, put the fluid with the highest working pressure through the tube side 3. If possible, put the high fouling fluid through the tube side
<ol style="list-style-type: none"> 1. Tube side can be cleaned only by chemical means 2. Individual tube replacement is difficult 3. Cannot be made single pass on tube side; therefore, true counter-current flow is not possible 4. Tube wall at U-bend is thinner than at straight portion of tube 5. Draining tube side is difficult in vertical (head-up) position 	<ol style="list-style-type: none"> 1. For oil heaters, wherever possible put steam through the tube side to obtain the most economical size 2. For water heating with steam or hot water, the B-300S or B-300W will prove most economical
	<ol style="list-style-type: none"> 1. Refer to FanEx catalog for complete, step-by-step selection procedure
	<ol style="list-style-type: none"> 1. Refer to AirEx catalog for complete, step-by-step selection procedure
<ol style="list-style-type: none"> 1. Not suitable for pressures over 300 psig 2. Not suitable for change of state or gaseous applications 	<ol style="list-style-type: none"> 1. For applications involving temperature crossing 2. Economical when exotic metals are required
<ol style="list-style-type: none"> 1. Can only be cleaned chemically 	<ol style="list-style-type: none"> 1. For applications involving temperature crossing or close temperature approach 2. Ideal for refrigerant-to-liquid or refrigerant-to-gas applications 3. Very economical when compared to all-stainless tubular construction
<ol style="list-style-type: none"> 1. HW1 Coil not suitable for installation with tubes vertical 2. Individual tubes cannot be cleaned or plugged 	<ol style="list-style-type: none"> 1. Refer to Heating Coil Product Selection Guide for information concerning special construction, limits and control

HEAT Exchanger Model Selection Guides

For general heating and cooling, shell-and-tube heat exchangers are often the best solution.

Model	Type	Design Pressure PSI		Max Temp. F	Surface Area Ft ²	Nom. Dia. In.	Connection Type	Basic Materials	ASME Option	Material Options	TEMA
		Shell Side	Tube Side								
BCF	Straight Tube Fixed Tubesheet	300	150	300	1.2 - 124	2 - 8	NPT	Copper Brass Cast Iron	No	None	No
BCU	U-Tube Removable Bundle	200	150	300	3.7 - 200	3 - 8	NPT	Copper Brass Cast Iron	No	90/10 Bronze Stainless	No
HCF	Straight Tube Fixed Tubesheet	300	150	300	1.2 - 247	2 - 8	NPT	Copper Brass Cast Iron	Yes	90/10 Bronze Stainless	No
HFF	Straight Tube Fixed Tubesheet	300	150	300	9.1 - 247	5 - 8	NPT/SAE Bolt	Copper Brass Cast Iron	No	90/10 Bronze Stainless	No
SK2000	Straight Tube Fixed Tubesheet	300	150	300	4.6 - 136	3 - 8	NPT	Copper Steel Cast Iron	No	90/10 Bronze Stainless	No
SK2000C	Straight Tube Fixed Tubesheet	300	150	300	9.1 - 247	5 - 8	NPT	Copper Steel Cast Iron	Yes	90/10 Bronze Stainless	No
SK2000U	U-Tube Removable Bundle	150	150	375	4.8 - 500	4 - 12	NPT/ANSI Fig.	Copper Steel Cast Iron	Yes	90/10 Bronze Stainless	No
SSCF	Straight Tube Fixed Tubesheet	225	150	450	1.2 - 124	2 - 8	NPT	Stainless	No	None	No
SSCF-K	Straight Tube Fixed Tubesheet	225	150	450	1.2 - 124	2 - 8	NPT	Stainless	Yes	Cast Iron Bronze	No
SSCU	U-Tube Removable Bundle	150	150	450	7 - 200	5 - 8	NPT	Stainless	Yes	Cast Iron Bronze	No
B300	U-Tube Removable Bundle	150	150	375	4.8 - 2000	4 - 29	NPT/ANSI Fig.	Copper Steel Cast Iron	Yes	90/10 Bronze Stainless	No



Custom Shell-and-Tube

HEAT Exchangers for process applications

Model	Type	Design Pressure PSI Shell Side	Design Pressure PSI Tube Side	Max Temp.F	Nom. Dia. In.	Connection Type	Basic Materials	ASME Option	Material Options	TEMA Type
CPK	Straight Tube Removable Bundle	75-450	75-300	650	3 - 31	ANSI Flg.	Steel Stainless Copper Alloys	Yes	Titanium Alloy C276 Alloy 2205	BEW AEW
C100	Straight Tube Removable Bundle	75-450	75-1500	650	8 - 42	ANSI Flg.	Steel Stainless Copper Alloys	Yes	Titanium Alloy C276 Alloy 2205	BEP AEP
C200/C210	Straight Tube Fixed Tubesheet	75-450	75-450	650	5 - 42	ANSI Flg.	Steel Stainless Copper Alloys	Yes	Titanium Alloy C276 Alloy 2205	BEM AEL NEN
C300/C320/C330	U-Tube Removable Bundle	75-300	75-600	650	4 - 42	ANSI Flg.	Steel Stainless Copper Alloys	Yes	Titanium Alloy C276 Alloy 2205	BEU AEU
C400	Straight tube Removable Bundle Internal Bolting	75-450	75-600	650	8 - 42	ANSI Flg.	Steel Stainless Copper Alloys	Yes	Titanium Alloy C276 Alloy 2205	BET AET
C500	Straight tube Removable Bundle Internal Clamp Ring	75-450	75-600	650	6 - 42	ANSI Flg.	Steel Stainless Copper Alloys	Yes	Titanium Alloy C276 Alloy 2205	BES AES
S1000/S1000R	Straight Tube Fixed Tubesheet	15	75-300	300	15 - 60	ANSI Flg.	Steel Copper Alloys	Yes	Titanium	N/A

For more information,

call **1.800.447.7700**, or visit

www.ittstandard.com

For cooling air or gas to remove moisture and contamination, compact and rugged heat exchangers are a good choice.

Model	Design Pressure (PSI) Shell Side	Design Pressure (PSI) Tube Side	Max. Design Temp. (°F)	Surface (Ft. ²)	Nom. Dia. (In.)	Tube Sizes & Types	Number of Passes	Standard Tube Lengths Only	Fixed Nozzle Sizes	Fixed Nozzle Orientation	Basic Materials	Optional Materials	ASME Code	
A100°	150	150 300	Shell side 250°	8.3 to 1,700	2" thru 19" & 23" incl.	3/8" O.D. (2" thru 13")	1-Pass only	No	Yes	Yes	Shell: Steel	None	Yes	
A200°			Tube side 150 # Des. 400° 300 # Des. 400°			5/8" O.D. (6" thru 23")		Bare			Yes			Tubes: Copper
A300°			Shell side 250°			3/8" O.D. Amalran Compartmented I.D. O.D. Bare		Tube side 150 # Des. 400° 300 # Des. 350°			3/8" O.D. Amaclean Inner Fin I.D. O.D. Bare			Tubesheets Muntz
HCF-Q° Aftercooler	200	150	300°	Not Applicable	2" thru 8"	1/4" O.D. (2" thru 4") 3/8" O.D. Amaclean (5" thru 8")	1-Pass only	Yes	Yes	Yes	Copper Brass Cast Iron	Copper Tubes	No (2" thru 4") Yes (5" thru 8")	

For steam condensing, the S1000° unit is dependable, well-engineered, and performance-proven.

Model	Design Pressure (PSI) Shell Side	Design Pressure (PSI) Tube Side	Max. Design Temp. (°F)	Surface (Ft. ²)	Nom. Dia. (In.)	Tube Sizes & Types	Number of Passes	Standard Tube Lengths Only	Fixed Nozzle Sizes	Fixed Nozzle Orientation	Basic Materials	Optional Materials	ASME Code	*
S1000R°	30" Hg. Vac. & 15 psig	HEI Std. 30, 75 & 100 ASME 75, 150 & 300	150°	200 to 12,000	15" thru 48"	5/8" O.D. (2" thru 4") 3/4" O.D. Bare Tubes	1, 2 & 4-Pass	No	No	No	Steel Copper Tubes	Consult home office	Yes Tube side only	††

PlateFlow® units for complex fluids and processes. A lot of cooling in a little space — using ordinary or exotic metals.

Models	Connections Size Inches	ASME Code	Max. Design Press PSIG	Max. Design Temp. F	Plate Type	Plate Material	Gasket Material
P4,P8	1	Yes	300	300	Std.	SS304 SS316 Titanium Alloy C276 SMO 254	Nitrile EPDM Vitron Butyl Neoprene
P7,P14,P20	2	Yes	300	300	Std.		
P37	3	Yes	300	300	Std.		
P21, P22, P47, P64	4	Yes	300	300	Std.		
P41, P42, P62, P86, P110	6	Yes	300	300	Std.		
P43, P65, P100, P130, P152, P220	8	Yes	300	300	Std.		
P110	10	Yes	300	300	Std.		
P81, P121, P188, P251	12	Yes	300	300	Std.		
P145, P210	16	Yes	300	300	Std.		
P201	18	Yes	300	300	Std.		
FP25	2	Yes	150	300	Wide Gap		
FP53	4	Yes	150	300	Wide Gap		
FP101, FP131, FP229, FP123	8	Yes	150	300	Wide Gap		
FP160	12	Yes	150	300	Wide Gap		
WP26, WP40	4	Yes	300	300	Semi-Welded		
WP54	6	Yes	300	300	Semi-Welded		
WP59	8	Yes	300	300	Semi-Welded		
WP189	12	Yes	300	300	Semi-Welded		

For cooling oil, compressed air or water with air, select one of our FanEx® models.

Model	Max. Design Pressure (PSI)	Max. Design Temp. (°F)	Flow Rates (gpm)	Inlet/Outlet Connections (NPT size)	Fan Motor (HP)	Basic Materials	Optional Materials	*
FanEx®	300	350°	6 to 180	1" thru 3" incl.	1/8 to 5	Copper Tubes Aluminum Fins	Copper Fins	††
AirEx®	250	250°	6 to 180	1" thru 3" incl.	1/3 to 10	Brased Aluminum Aluminum Fins	N/A	

Heavy duty heating coils heat air with steam, water or other heat-transfer fluids.

Max. Working Pressure Model	Max. Design Temp. (PSIG)	Single Element Max. Face Area (°F)	Connections (sq. ft.)	Basic (size)	Optional Materials	Materials	*
H	350	400	48	2"	90/10 CuNi Tube Copper fins Steel casing	Steel or stainless steel tubes Aluminum fins	† ††
HD1	350	400	48	2 1/2" or 3" inlet 2" return	90/10 CuNi outer tube Copper inner tube Copper fins Steel casing	Steel or stainless steel tubes Aluminum fins	† ††
HW1	350	400	48	2 1/2" or 3"	Copper tubes Copper fins Steel casing	Aluminum fins	† ††
HRP, HRC	800	800	200	C.F.	Copper tubes & fins Galvanized steel casing	Aluminum, CuNi, SS, Steel, or Special	† ††

Brazepak® Brazed Heat Exchangers: A lot of technology in a small package.

Model	Design Pressure (PSIG)	Design Temperature (°F)	Maximum Number of Plates	Maximum Liquid Flow (gpm)	Connections	Maximum Surface (sq. ft.)	Basic Materials	Optional Features
400	435	450°	50	25	3/4" MPT	7	316L Stainless Steel Copper Brazed	No. of passes, Conn. Types, Orientation & Braze Materials
410 411 412			150	60	1" MPT	40		
415			150	75	1" MPT	80		
422			150	160	2" MPT	155		
433	360	365°	200	300	4" Flanged	600		

For more information, please contact:



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