



ITT Standard

the new  
standard in | **Heat Transfer Equipment**  
Century® Series Heat Exchangers



Pre-engineered & custom-engineered heat exchangers, designed to TEMA specs.

*Engineered for life*

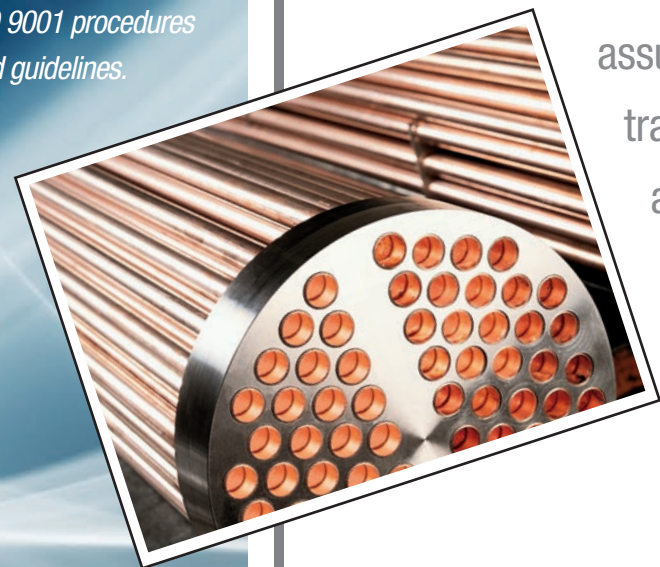


# Century<sup>®</sup> Series HEAT Exchangers

As the recognized leader in heat exchanger products, systems and technology, ITT Standard has been providing state-of-the-art solutions to heat transfer problems for more than 75 years.

Today, the company is devoted exclusively to the design, engineering and manufacture of shell-and-tube, gasketed plate, brazed plate and air-cooled heat exchanger products. ITT Standard heat exchangers are engineered and manufactured by experienced craftsmen who have been devoted to the science of heat transfer not just for years, but for generations. And because we offer such a wide assortment of

different heat exchanger designs, we can assure you of getting the optimum heat transfer solution to your specific application, without bias toward any one particular (or proprietary) product line.



*ITT Century Series heat exchangers are manufactured with the highest standards of quality. ITT Standard was the first North American heat exchanger manufacturer to be certified under ISO 9001 procedures and guidelines.*

## Design | FLEXIBILITY

**The Century Series — the flexible answer to heat transfer problems.**

Flexible in design, **Century heat exchangers** are capable of handling high pressures and temperatures, as well as a wide variety of fluids and gases. Based on a mechanically straightforward design, they offer a virtually limitless array of choices in terms of performance, materials, options and features.

**Century heat exchangers** combine choice of options and control of custom design with economies of standardization and production, to give you the precise heat exchanger you need at the lowest cost.

**Century series heat exchangers** can be designed and manufactured to the standards and guidelines of the following: TEMA (Tubular Equipment Manufacturers Association), ASME (American Society of Mechanical Engineers), API (American Petroleum Institute), ABS (American Bureau of Shipping), The Pressure Equipment Directive (97/23/EC), USN (U.S. Navy) and others. At ITT Standard, we work directly with these organizations, and frequently offer our facilities — particularly our advanced thermal research laboratory — along with our expertise to help set, clarify and implement standards that contribute to the overall strength of the heat transfer industry.

## Design | EXPERIENCE

**Custom-design flexibility with off-the-shelf economy.**

The continuous flow of design innovations and refinements, the availability of a variety of new construction materials, and an expanding array of “non-traditional” applications have made the task of heat exchanger selection more complex than ever before.

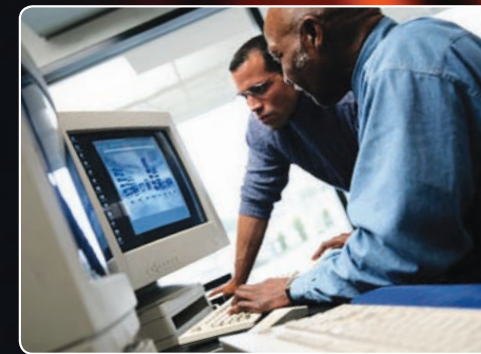
Engineers are increasingly finding answers to these challenges in the Century Series heat exchangers from ITT Standard. This line of products offers a vast range of combinations in design, performance, materials and options for virtually any heat transfer problem.

Whatever the application requires, chances are there's a Century Series heat exchanger that's right for the job:

- Fixed or floating tubesheet, single- or multi-pass, straight or U-tube, fixed tubesheet or removable bundle
- Steel or stainless, copper or bronze, nickel or exotic alloys, Hastelloy<sup>®</sup>, Monel<sup>®</sup> or titanium



*ITT Standard is headquartered in one of the largest and best-supported heat exchanger centers in the world.*



*Our design staff and computerized selection process will help you choose the best heat exchanger for your application.*

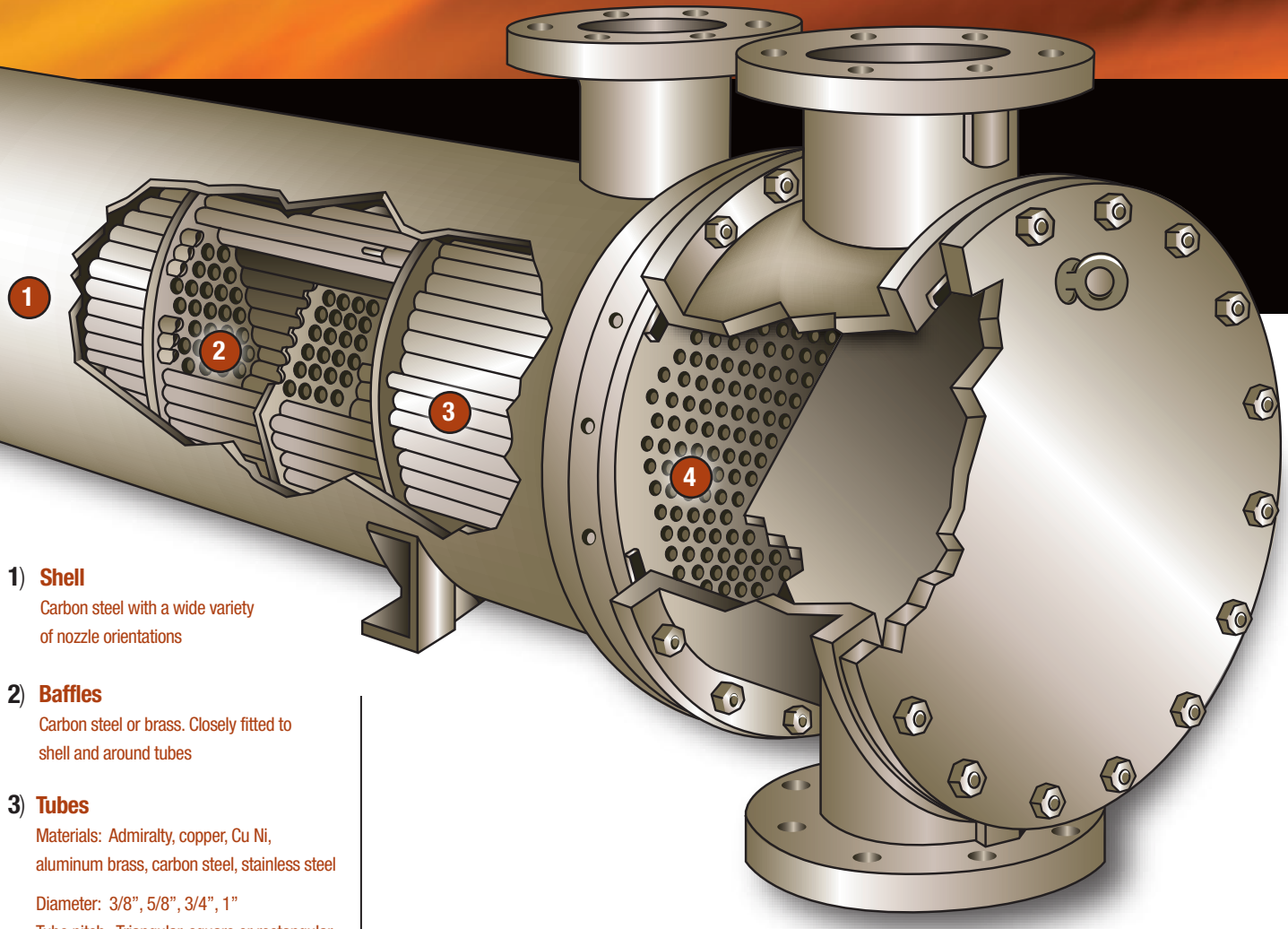


*Century Series heat exchangers are manufactured with rugged construction for tough day-to-day operations.*



*High standards of quality are found in every aspect of manufacturing, packaging and shipping.*





- 1) Shell**  
Carbon steel with a wide variety of nozzle orientations
- 2) Baffles**  
Carbon steel or brass. Closely fitted to shell and around tubes
- 3) Tubes**  
Materials: Admiralty, copper, Cu Ni, aluminum brass, carbon steel, stainless steel  
Diameter: 3/8", 5/8", 3/4", 1"  
Tube pitch: Triangular, square or rectangular.  
Tubes can be bare or Low-Fin
- 4) Tubesheet**  
Carbon steel, Muntz metal, cupro-nickel, naval brass, stainless steel

## Heat Exchanger SELECTION

### Selecting the right heat exchanger.

Your ITT Standard representative has complete information on Century Series and other heat exchanger products to help you meet your particular application requirements. The latest industry standards and computer technology help us provide the most accurate heat transfer calculations. We can use commercial heat transfer programs such as BJAC® and HTRI®, or programs based upon research from our own heat transfer laboratory for complete, accurate and timely heat transfer ratings.

*Our advanced thermal research lab is one of the largest and best equipped facilities in the industry. Staffed by a team of experienced chemical, mechanical and metallurgical engineers, it is used to solve heat transfer problems and identify opportunities for product improvement and development. It is also made available to industry groups, to develop standards and guidelines for product design, manufacturing and testing.*

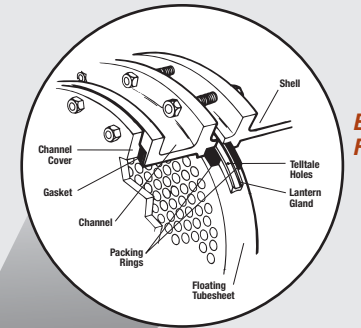


## CENTURY CPK SERIES

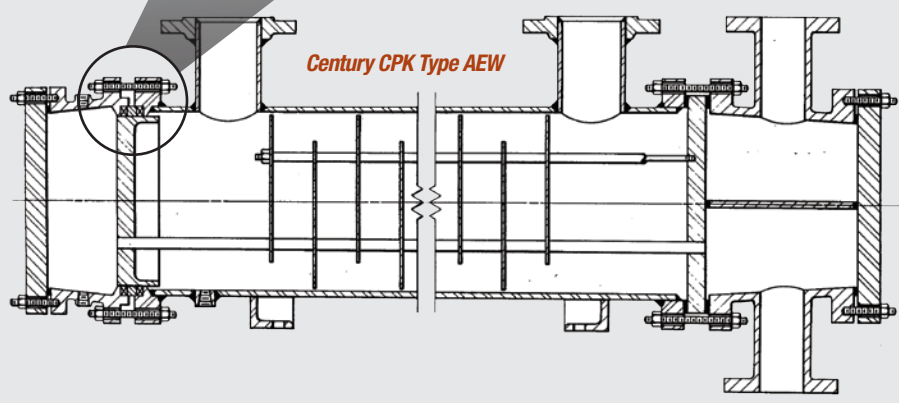
- Straight tube, removable bundle, packed floating tubesheet.
- Single or two pass tube arrangements for maximum efficiency over a wide variety of tube side flow rates.
- Standard shell sizes from 3 inches through 31 inches in diameter; custom designs up to 60 inches in diameter.
- Available in horizontal and vertical installations as well as stacked assemblies.

### Century CPK Standard Design Capabilities

	Design Pressure	Design Temperature
Tube side	75 – 450 psi	-20 – 650° F
	517 – 3,102 kPa	-29 – 343° C
Shell side	75 – 300 psi	-20 – 650° F
	517 – 2,068 kPa	-29 – 343° C



Externally Sealed Floating Tubesheet



TEMA Type AEW or BEW.  
Can meet TEMA "B", "C" and "R", ASME Section VIII Div. 1 "U" stamp and ASME Section III "N" stamp.

### Advantages:

*Floating tubesheet allows differential expansion between the shell and tubes.*

*Maximum tube count per shell diameter.*

*Shell side can be steam or mechanically cleaned.*

*Bundle can be easily replaced or repaired.*

*Less costly than full internal floating head type construction.*

### Limitations:

*Both shell side and tube side exposed to packing. Volatile and/or toxic fluids should be avoided.*

*Packing limits design pressure and temperature for both shell and tube sides.*



## CENTURY C100

TEMA Type AEP or BEP.  
Can meet TEMA "B", "C" and "R",  
ASME Section VIII Div. 1, and  
ASME Section III "N" stamp.

### Advantages:

Floating tubesheet allows  
differential expansion  
between the shell and tubes.

Shell side can be steam  
or mechanically cleaned.

Bundle can be easily  
repaired or replaced.

Less costly than full  
internal floating  
head-type construction.

Only shell side fluids  
are exposed to packing.

Volatile or toxic fluids  
possible on tube side.

Provides large bundle  
entrance area.

### Limitations:

Shell side limited to  
non-volatile and/or  
non-toxic fluids.

Shell side packing  
limits design pressure  
and temperature.

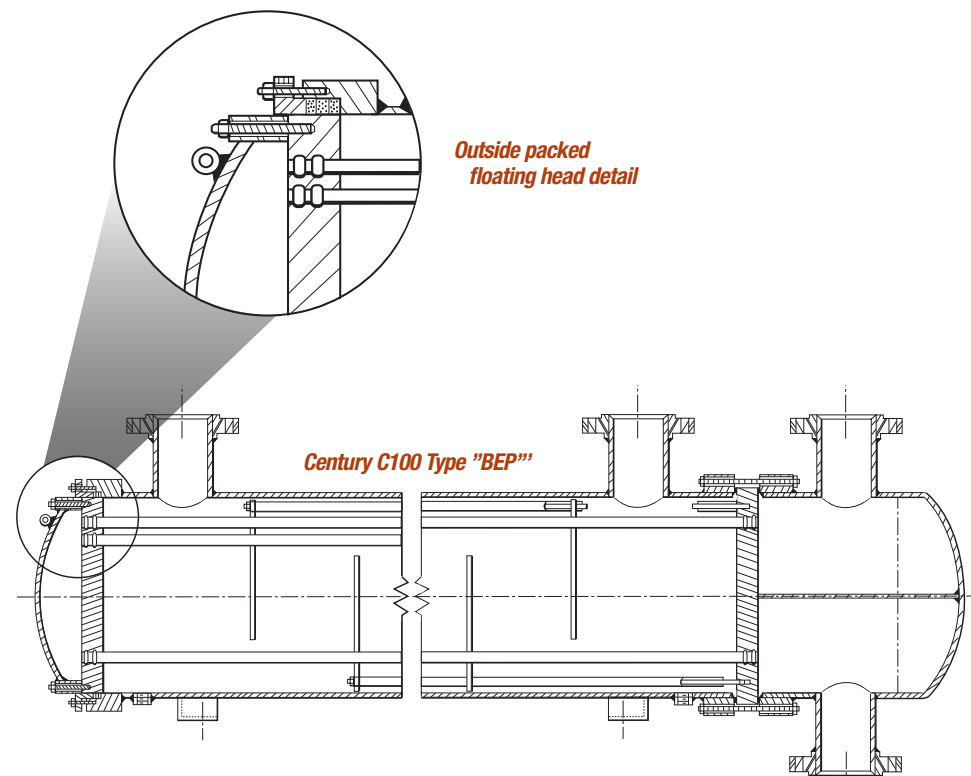
Less surface per given shell  
and tube size than TEMA  
type AEW or BEW designs.

- Straight tube, removable bundle, outside-packed floating head.
- Single- or multi-pass tube arrangements for maximum efficiency over a wide variety of tube side flow volumes.
- Standard shell sizes from 8 inches through 42 inches in diameter; custom designs up to 60 inches in diameter.
- Available for horizontal or vertical mounting.

### Century C100 Standard Design Capabilities

	Design Pressure	Design Temperature
Tube side	75 – 450 psi	-20 – 650° F
	517 – 3,102 kPa	-29 – 343° C
Shell side	75 – 300 psi	-20 – 650° F
	517 – 2,068 kPa	-29 – 343° C

**Note:** Custom designs to 3,600 psi/24,816 kPa and 1000° F/538° C,  
depending on shell diameter and design temperature.



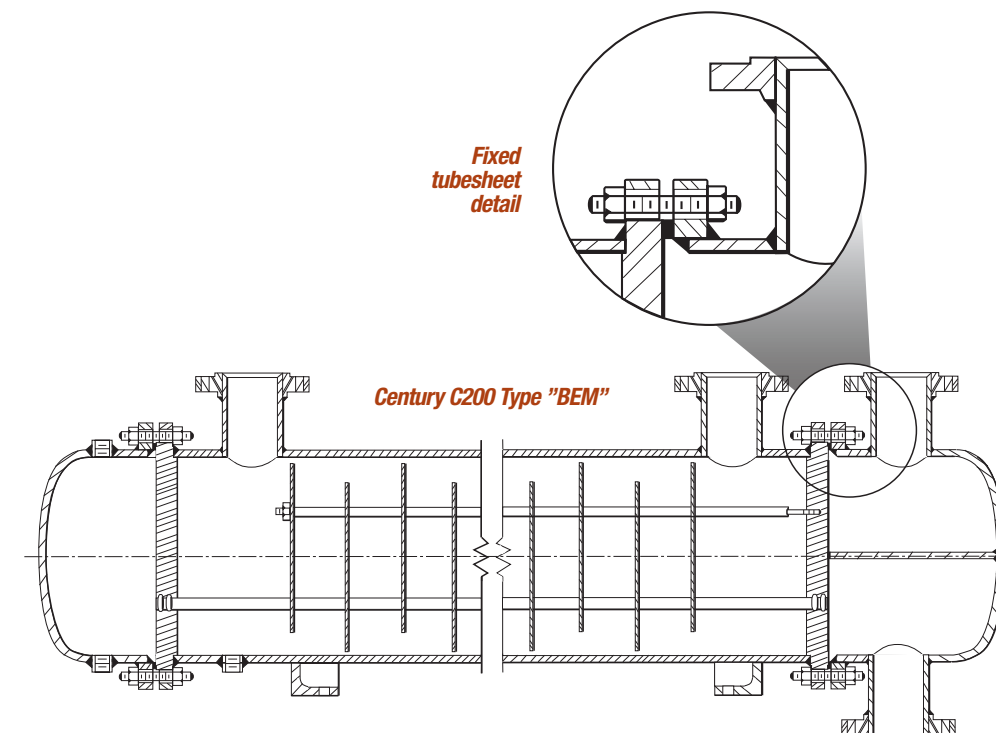
## CENTURY C200 | C210

- Straight tube, fixed tubesheet, removable channel or bonnet (C200) or integral channel (C210).
- Single- or multi-pass tube arrangements for maximum efficiency over a wide variety of tube side flow volumes.
- An expansion joint can be added to compensate for severe temperature differentials.
- Standard shell sizes from 5 inches through 42 inches in diameter; custom designs up to 60 inches in diameter.
- Available for horizontal or vertical mounting.

### Century C200 and C210 Standard Design Capabilities

	Design Pressure	Design Temperature
Tube side	75 – 450 psi	-20 – 650° F
	517 – 3,102 kPa	-29 – 343° C
Shell side	75 – 300 psi	-20 – 650° F
	517 – 2,068 kPa	-29 – 343° C

**Note:** Custom designs to 3,600 psi/24,816 kPa and 1000° F/538° C,  
depending on shell diameter and design temperature.



TEMA Type AEM, BEM or NEN.  
Can meet TEMA "B", "C" and "R",  
ASME Section VIII Div. 1, and  
ASME Section III "N" stamp.

### Advantages:

Less costly than removable  
bundle exchangers.

Provides maximum heat  
transfer surface area per  
given shell and tube size.

Easily interchangeable  
with designs of various  
other manufacturers.

Tube side can be steam  
or mechanically cleaned.

Only tube side fluids are  
exposed to gaskets.  
Volatile or toxic fluids  
possible on shell side.

Easy accessibility for tube  
side cleaning and inspection.

No packed joints.

### Limitations:

No provision for differential  
expansion of tubes and shell  
without expansion joint.

Shell side can be cleaned  
by chemical means only.



# CENTURY C300 | C320

TEMA Type AEU or BEU.  
Can meet TEMA "B", "C" and "R",  
ASME Section VIII Div. 1, and  
ASME Section III "N" stamp.

## Advantages:

Allows for differential thermal expansion between shell and tubes, as well as between individual tubes.

High heat transfer surface area for given shell and tube size.

Capable of withstanding thermal shock.

The most economical of all shell-and-tube exchangers, and the least expensive of all basic designs.

Shell side can be steam or mechanically cleaned.

Bundle can be removed for shell side cleaning and maintenance.

## Limitations:

Individual tube replacement is difficult.

Cannot be made single-pass on tube side, so true counter-current flow is not possible.

Draining tube side is difficult in vertical (head-up) position.

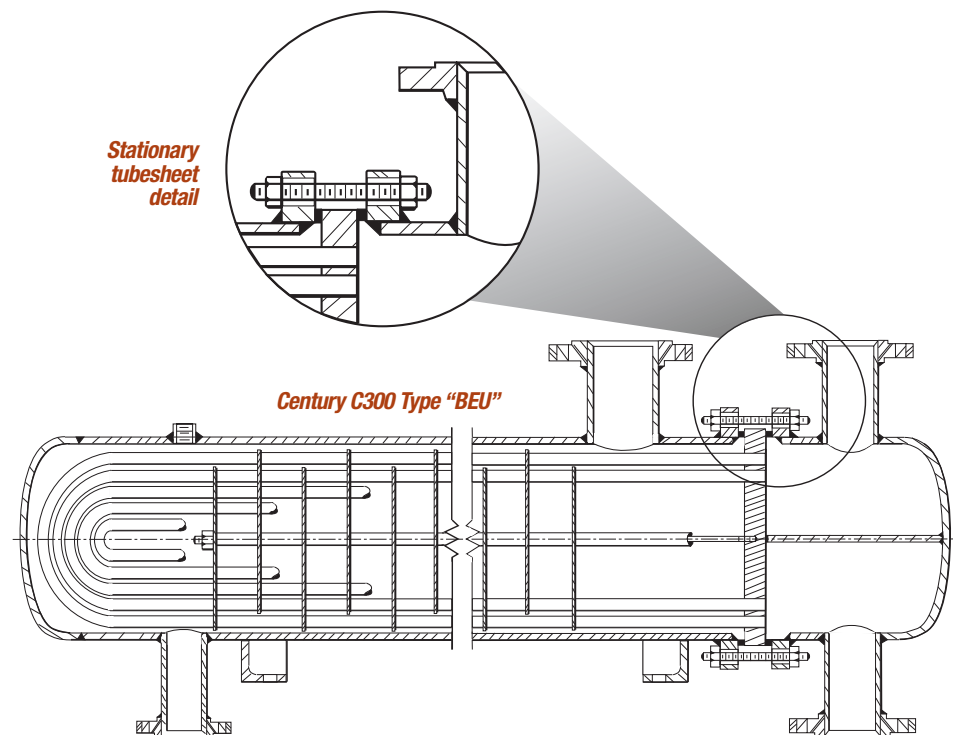
Tube side can be cleaned by chemical means only.

- U-tube, removable bundle (C300) or suction-heater (open-end shell) construction (C320).
- Multi-pass tube arrangements for maximum efficiency over a variety of tube side flow volumes.
- The C320 is much like the C300, but has an open-end shell and special tube layout for tank suction heating applications.
- Standard shell sizes from 5 inches through 42 inches in diameter; custom designs up to 60 inches in diameter.
- Available for horizontal or vertical mounting.

Century C300 and C320 Standard Design Capabilities

	Design Pressure	Design Temperature
Tube side	75 – 450 psi 517 – 3,102 kPa	-20 – 650° F -29 – 343° C
Shell side	75 – 300 psi 517 – 2,068 kPa	-20 – 650° F -29 – 343° C

**Note:** Custom designs to 3,600 psi/24,816 kPa and 1000° F/538° C, depending on shell diameter and design temperature.



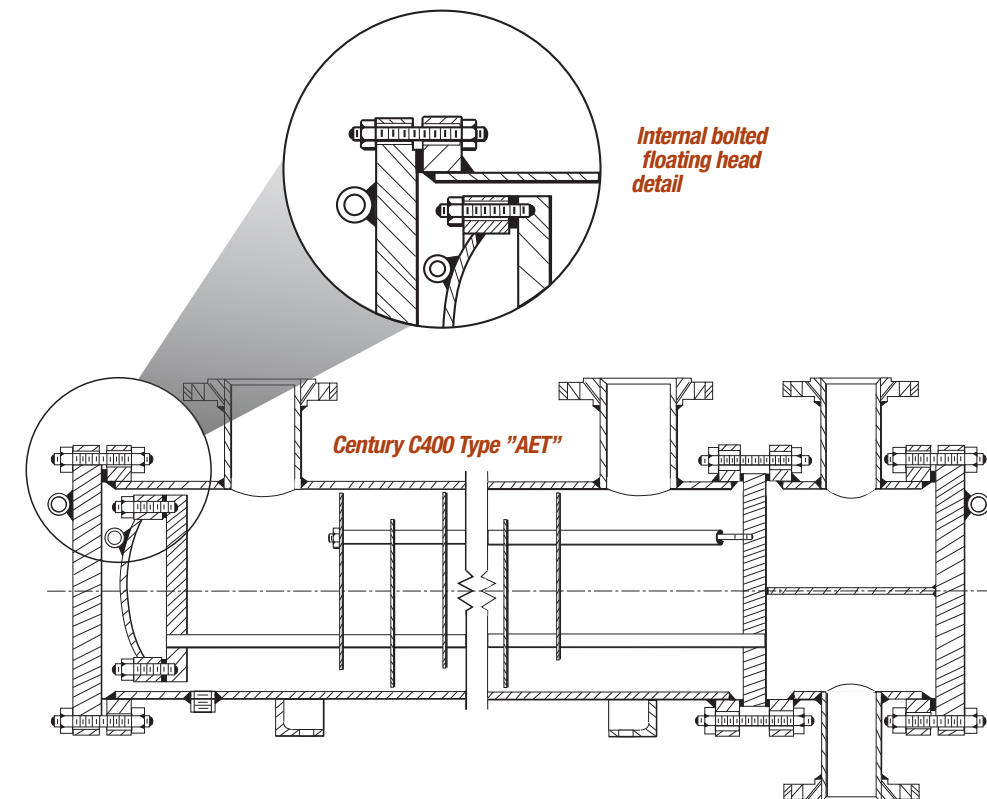
# CENTURY C400

- Straight tube, internally bolted floating head, pull-through construction with removable bundle.
- Multi-pass tube arrangements for maximum efficiency over a wide variety of tube side flow volumes.
- Standard shell sizes from 8 inches through 42 inches in diameter; custom designs up to 60 inches in diameter.

Century C400 Standard Design Capabilities

	Design Pressure	Design Temperature
Tube side	75 – 450 psi 517 – 3,102 kPa	-20 – 650° F -29 – 343° C
Shell side	75 – 300 psi 517 – 2,068 kPa	-20 – 650° F -29 – 343° C

**Note:** Custom designs to 3,600 psi/24,816 kPa and 1000° F/538° C, depending on shell diameter and design temperature.



TEMA Type AET or BET.  
Can meet TEMA "B", "C" and "R",  
ASME Section VIII Div. 1, and  
ASME Section III "N" stamp.

## Advantages:

Bundle can be removed from shell for cleaning or maintenance.

Lack of packed joints allows for handling volatile or toxic fluids.

Large bundle entrance area.

Allows for differential thermal expansion between shell and tubes.

Bundle can be pulled without removing floating head cover.

## Limitations:

Less heat transfer surface area for given shell and tube size than other removable bundle designs.

The costliest of all basic types of heat exchanger designs.

Gasket leak detection not possible on floating head.

## CENTURY C500

TEMA Type AES or BES.  
Can meet TEMA "B", "C" and "R",  
ASME Section VIII Div. 1, and  
ASME Section III "N" stamp.

### Advantages:

Higher heat transfer surface  
area per given shell and tube  
size than pull-through designs  
(AET or BET Types).

Allows for differential thermal  
expansion between the shell  
and tubes.

Lack of packed joints allows  
for handling volatile and/or  
toxic fluids.

Provides multi-pass tube  
arrangements.

Bundle can be removed  
for shell side cleaning  
and maintenance.

### Limitations:

Shell cover, clamp ring and  
floating head cover must be  
removed prior to removing  
bundle. This results in higher  
maintenance cost compared  
to "pull-through" designs  
(AET or BET).

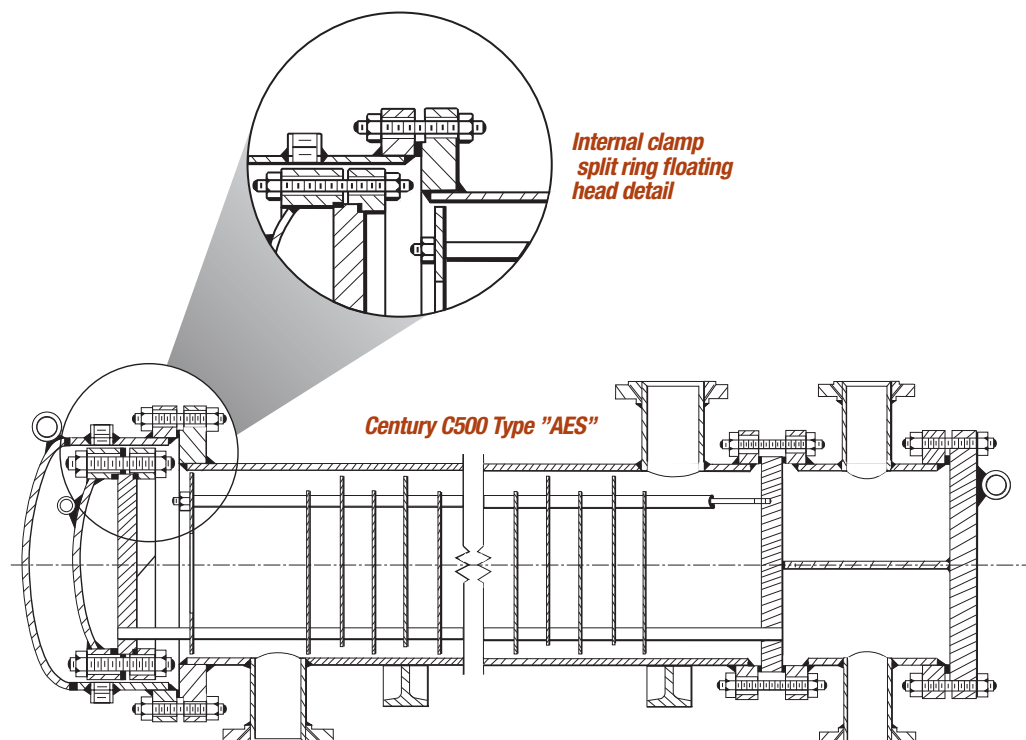
More costly than fixed  
tubesheet and U-tube  
designs.

- Straight tube, internal clamp split ring, floating head, removable bundle.
- Multi-pass tube arrangements for maximum efficiency over a wide variety of tube side flow volumes.
- Standard shell sizes from 6 inches through 42 inches in diameter; custom designs up to 60 inches in diameter.
- Available for horizontal or vertical mounting.

### Century C500 Standard Design Capabilities

	Design Pressure	Design Temperature
Tube side	75 – 450 psi	-20 – 650° F
	517 – 3,102 kPa	-29 – 343° C
Shell side	75 – 300 psi	-20 – 650° F
	517 – 2,068 kPa	-29 – 343° C

**Note:** Custom designs to 3,600 psi/24,816 kPa and 1000° F/538° C,  
depending on shell diameter and design temperature.



## CENTURY® SERIES HEAT EXCHANGERS

Century® Series heat exchangers are available with a wide range of custom features,  
design variations, special materials and options to meet virtually any heat transfer requirement.

Drawing on more than 75 years of thermal and mechanical design experience and heat transfer  
expertise, ITT Standard engineers have developed an unequalled range of choices to help you  
select the precise heat exchanger you need to meet your specific requirements.

### MATERIALS

#### STANDARD DESIGNS

##### Shells

- Steel, 304SS, 316SS, 304LSS, 316LSS  
up to 42-inch diameter.

##### Bonnets/channels

- Steel, 304SS, 316SS, 304LSS, 316LSS,  
Cast Iron, Cast Bronze, Ductile Iron.

##### Tubesheets

- Aluminum Bronze, 90/10 Cu Ni, Muntz,  
RNB, 304SS, 316SS, 304LSS, 316LSS, Steel.

##### Tubes

- Carbon Steel, Stainless Steel, Nickel and  
Nickel Alloys, Titanium and other Alloys.  
Bare and Lo-Fin Tubing.

### CAPABILITIES

- Hydraulic tube expansion
- Seal and strength welding of tubes  
to tubesheet
- Expansion joints (flanged and flued head  
as well as bellows type)
- Surface finish analysis
- Heat transfer test laboratory (4,000 ft<sup>2</sup>)
- Helium leak testing
- Radiographic, ultrasonic and magnetic  
particle testing (sub-contracted)
- API oil flushing

### DESIGN CAPABILITIES

#### CUSTOM DESIGNS

##### Materials

- Stainless steel(s) (including Alloy 20, 317SS, AL6XN,  
904LSS, etc.) • Hastelloy • Titanium • Monel
  - 90/10 CuNi • 70/30 CuNi • Inconel • Incoloy®
  - Avesta 254SMO
- (Note: Weld qualifications may have to be developed.)

##### Diameter

- Up to 42 inches for standard designs;  
custom designs up to 60 inches.

##### Length

- Up to 30 feet for standard steel designs and 21 feet  
for standard stainless steel designs; custom designs  
up to 40 feet.

##### Temperature

- From -20° F (-29° C) up to 650° F (343° C) with  
standard designs; custom designs from  
-300° F (-184° C) up to 1000° F (538° C).

##### Weight

- 30 tons maximum.

### SPECIFICATIONS

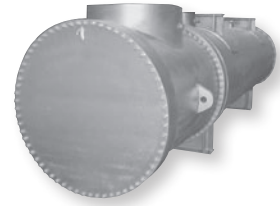
- ASME Section III "N" stamp
- ASME Section VIII Division 1
- TEMA Classes "B," "C" and "R"
- API
- ABS
- US Navy (Mil C-15730)
- The Pressure Equipment Directive (97/23/EC)

Not all options are  
available on all  
Century® Series  
units; consult your  
ITT Standard  
representative or  
the factory.



# Models of efficiency.

**Century Series®**  
Engineered/customized  
heat exchangers  
for process and other  
heating/cooling  
applications.



**Plateflow®**  
Gasketed plate & frame  
heat exchanger.



**BCF®, HCF®, SSCF®**  
Pre-engineered  
shell-and-tube heat  
exchangers for general  
heating and cooling.



**Brazepak®**  
Brazed plate  
heat exchanger.



**FanEx® and AirEx®**  
Air/oil, air/air, or air/water  
heat exchangers.



**For more information, please contact:**



**ITT**

175 Standard Parkway • Cheektowaga, NY 14227  
**800/447-7700 Fax: 716/897-1777**  
[www.ittstandard.com](http://www.ittstandard.com)

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