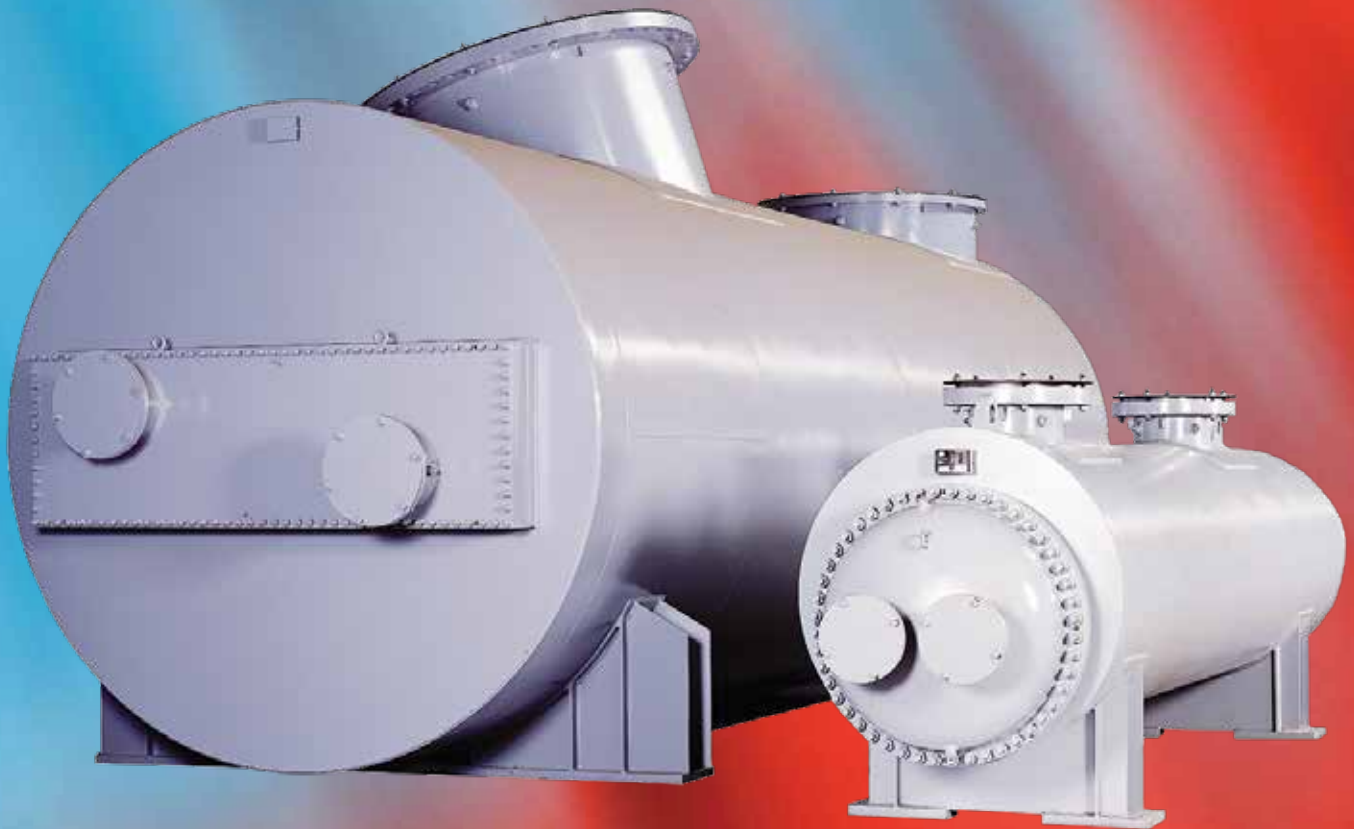


# BASCO® TYPE ES HEAT EXCHANGERS



# Basco® Type ES Extended Surface Plate Fin Heat Exchangers

We give you more features in an innovative, patented design for maximum efficiency and design flexibility.

## Everything You Want In A Heat Exchanger...And Less

API Basco®'s Type ES Extended Surface Plate Fin Heat Exchanger is the industry leader for intercooler and aftercooler performance. Its unique, patented, compact plate fin design gives you distinct advantages for centrifugal, axial or reciprocal compressor intercooler and aftercooler applications.

Type ES heat exchangers have more of the features you want for your applications in an innovative design that results in:

### Less Space

Compact package delivers maximum heat transfer with minimum space requirements.

### Less Coolant

We also offer coolers that use two different coolant flows to minimize cooling water usage.

### Less Piping

Cooler design is readily adaptable to existing compressor systems.

### Less Maintenance

Tubes are easily accessible for inspection and cleaning.

### Less Energy Consumption

Cools large volumes of air/gas at low pressure drop for lower energy costs.



# Basco® Type ES Coolers Advantages

## Optimum Nozzle Location

Gas inlet and outlet can be located almost anywhere along the shell surface. This feature simplifies piping system design because the ES is readily adaptable to existing requirements.

## Easy Bundle Accessibility

With the ES design, simply remove both the supply and the reversing bonnets for complete accessibility to the tube sheets for tube side cleaning. Other intercooler designs require complete removal of the bundle for similar operations.

## Vibration Free Design

Tubes are continuously supported over their entire length by plate fins.

## Optimized Air Velocity

The patented ES design easily accommodates standard compressor inlet and outlet line velocities. Unlike alternative designs, the ES requires no expensive piping enlargements to reduce line velocities for proper air distribution.

## Integrated Internal Moisture Separation

The need for an external separator is eliminated through the use of internal agglomerator plates and precisely directed air flow. An optional internal mesh separator can be provided to further enhance moisture separation.

## Rugged Construction

Basco®'s built-to-be-tough equipment minimizes downtime. ES intercoolers and aftercoolers have a proven track record of durable, problem-free performance.

## Absolute Hot/Cold Compartment Separation

Continuous silicone rubber seals at the top and bottom of the tube bundle prevent any mixing of inlet and outlet gas.

## Compact Design

Type ES heat exchangers maximize the heat transfer surface per unit volume of space. Engineered to order, including the availability of 2-circuit designs.

## Reduced Energy Consumption

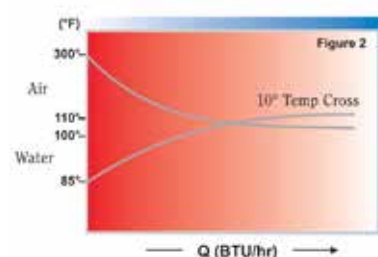
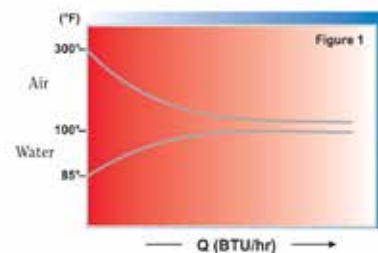
With the Basco® Type ES, minimized pressure drop significantly reduces the overall horsepower requirements of the compressor. In many cases pressure drop values of 1/2 psi or lower are realized. Generous flow areas, once through the bundle cooling, and the absence of baffles permit large volumes of gas to be cooled in a compact space.

Unique approach temperature characteristics permit a relatively large rise in cooling water outlet temperature. Unlike some conventional shell and tube coolers, ES outlet water temperatures are not limited to the outlet gas temperature.

### Example...

Consider 100,000 lbs/hr of dry air being cooled from 300°F to 100°F, a heat load of 4,840,000 BTU/hr and a coolant temperature of 85°F.

- With a conventional multi-pass shell and tube heat exchanger, the outlet temperature of the coolant can not be greater than 99.9°F. This translates to about 645 GPM, which requires a 6" line. (Fig. 1)
- With a Basco® Type ES cooler, the coolant temperature rise can be 20-25° and higher. With a typical rise of 25°F, the amount of coolant required is reduced to 390 GPM, which requires a 4" line. This lower coolant requirement translates to lower pumping costs and less expensive piping. (Fig. 2)



# Basco® Type ES Plate Fin

More options give you more application flexibility

No other intercooler or aftercooler design offers such ready adaptability to your existing compressor systems as the Basco® Type ES.

## Flexible Flow Arrangement

Four configurations of water and air connection combinations are available permitting optimum positioning of ES equipment and reduced system engineering.

## Material Options

### Tube Side

Tube options are carbon steel, 304, 316, 904 stainless steel, admiralty, 90/10 copper-nickel, 70/30 copper-nickel, or commercially available materials where customer specified. 3/8" and 5/8" tube diameters are available.

### Shell Side

Fins are constructed from aluminum, coated aluminum or copper.

### Shell Materials

Shell and bonnets are constructed from carbon steel or any commercially available and weldable material where customer specified. A full range of internal shell coatings is available to meet customer specifications.

### Shell Diameters

20" to 120"

### Shell Length

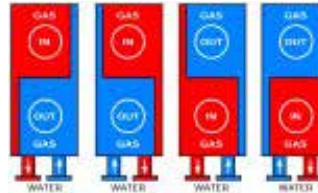
3' to 35'

### Design Capabilities

- ASME
- TEMA C, B and R
- API
- ISPEL
- AD-Merkblatt (TUV)

## Tailorable Fin Spacing

Variations in fin spacing (8 to 20 fins per inch) optimize thermal performance against pressure loss.



Typical Plate Fin Construction

### TEMA "C" Vessel

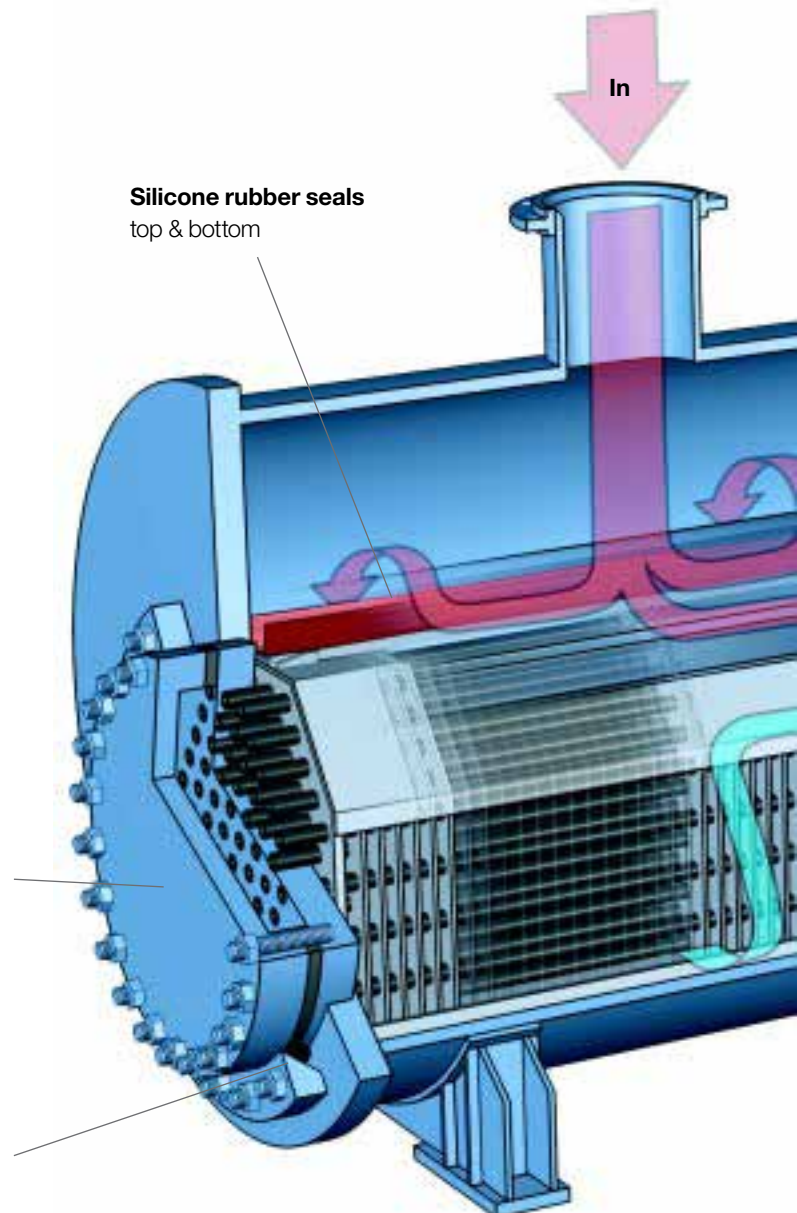
designed and stamped to ASME. TEMA B, TEMA R, and other design options are available

### Removable tubeside reversing bonnet

allows tubeside cleaning without removing bundle

### Shell side seal

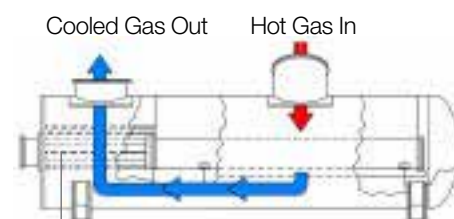
outside o-ring packed, fully gasketed options also available



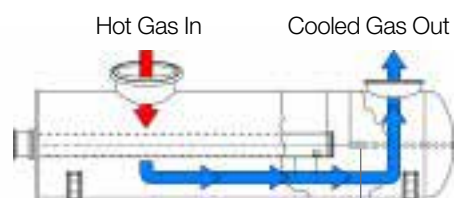
## Unique Flow Arrangement Provides Advantages

Hot gas is distributed throughout an absolutely discrete inlet compartment along the entire length of the plate fin tube bundle. Note the absence of baffles, which can inhibit gas flow. The gas passes through the bundle only once to the cold compartment and exits to the subsequent compressor stage. Dramatic changes in gas flow direction and strict velocity controls facilitate internal moisture separation

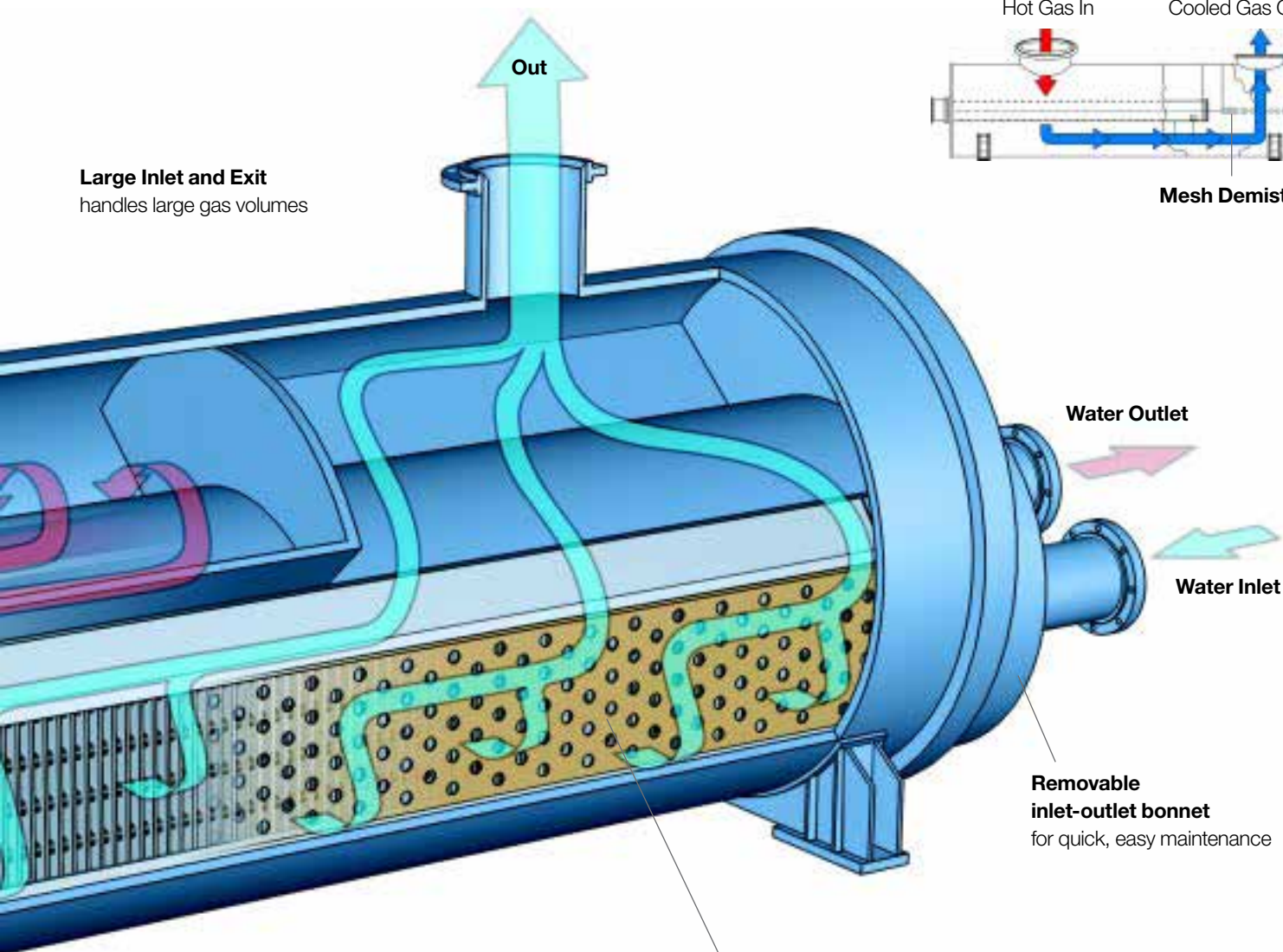
### Optional Designs – Model L



## Mesh Demister



## Mesh Demister



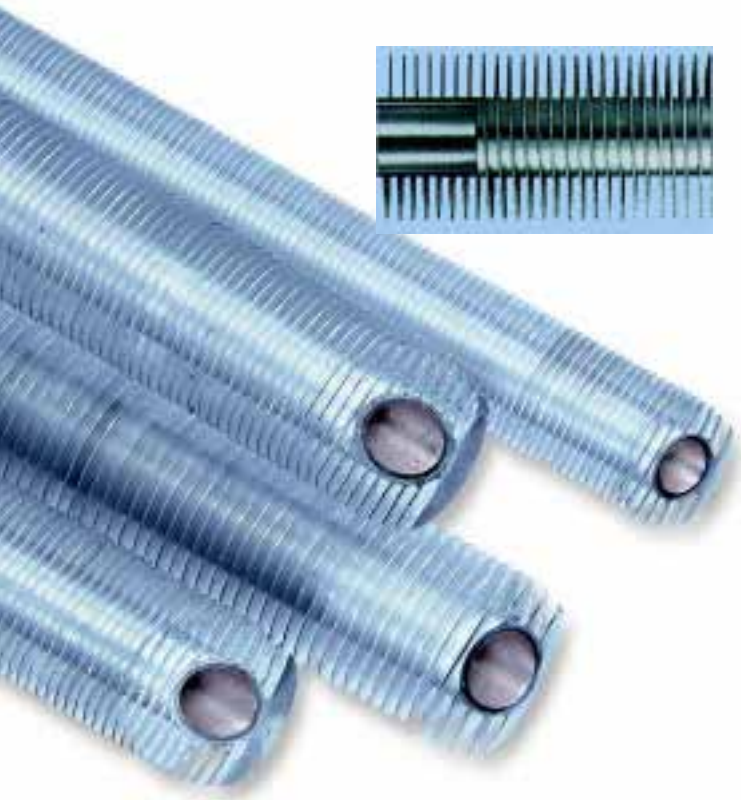
## Model S

**Agglomerator**  
distribution plate  
(demister pads available)

**Removable  
inlet-outlet bonnet**  
for quick, easy maintenance

# Basco® Type HF Heat Exchanger With Finned Tubes

High Efficiency And More Versatility



When required, API Heat Transfer can supply our Basco® Type HF Heat Exchangers equipped with unique finned tubes.

## Basco® Type HF Advantages

### More Tube Diameter Options

More tube diameter options provide greater design flexibility.

### More Tube Material Options

With no expansion limitations, the Type HF can be supplied in a wide range of tube materials including copper alloys, stainless steels, titanium, hastelloy and other commercially available materials.

### Higher Allowable Operating Pressures

Shell side operating pressures over 1,000 psi (69 bar) are possible with the Basco® Type HF models.

### More Tube And Fin Material Combinations

Upon customer preference, the Type HF allows a wider variety of material combinations.

### Positive Tube Support

Internal supports provide positive positioning of tubes without the need for baffles while ensuring excellent air-side flow conduction.

# State-Of-The-Art ISO 9001 Facilities

API Heat Transfer's ISO-9001 certified plant and fabrication resources are extensive. The manufacturing facility located in Buffalo, NY, has over 80,000 square feet, a well-equipped machine shop and an array of support equipment. These include advanced computer-based thermal and mechanical modeling tools for design and engineering, CNC machining centers, automated welding systems and advanced inventory management control systems.

API Heat Transfer is renowned for our design, manufacturing and delivery flexibility, enabling us to better meet your standard or custom requirements. We design and build to satisfy virtually any industry standard, U.S. or international. State-of-the-art ISO 9001 facilities

## Quality That Is Second To None

API Heat Transfer's advanced quality program is ISO-9001 certified. Each stage of manufacturing is subjected to rigorous inspection and testing from incoming materials to completed assembly.

## API Heat Transfer Will Deliver Your Solution

API Heat Transfer is a comprehensive resource, providing fast turnaround for heat exchanger solutions. API Heat Transfer's staff is highly knowledgeable in all phases of heat transfer and can help you put all the advantages of our products to work for your specific application.

Advanced designs such as the patented ES intercooler have been generated by a research and development program dedicated to finding new and more efficient solutions to customer requirements.





**API Heat Transfer**, a family of high-performance brands 

## High-performance heat transfer.

It's who we are and what we do. It's part of our 140-year heritage designing and delivering world-class heat transfer products for nearly every industry. It's bolstered by our worldwide network of manufacturing facilities that provide sales, service, and support. And it's ingrained in a process that has helped customers around the world for nearly a century and a half.

When you work with us, you'll find the performance of our technologies sets the bar for heat transfer products, and our relentless drive to find and create custom heat transfer solutions to meet any industry challenge sets us apart.

## See how our performance can improve yours.

Contact your API Heat Transfer sales rep or visit [apiheattransfer.com](http://apiheattransfer.com) today.

### USA

#### Buffalo Facility

2777 Walden Avenue  
Buffalo, NY 14225, USA  
+1.716.684.6700

#### Iron Ridge Facility

1025 Industrial Road  
Iron Ridge, WI 53035, USA  
+1.920.387.4200

#### Franklin Facility

4700 Ironwood Drive  
Franklin, WI 53132, USA  
+1.414.761.4500

#### Racine Facility

5215 21st Street  
Racine, WI 53406, USA  
+1.262.554.8330

### GERMANY

#### Bretten Facility

Langenmorgen 4  
75015 Bretten, Germany  
+49.7252.53.0

### CHINA

#### Suzhou Facilities Building 1

156 Qingqiu Street, 3rd District  
Suzhou Industrial Park  
Suzhou, Jiangsu 215126, China  
+86.512.8816.8000

#### Building 2

126 Qingqiu Street, 3rd District  
Suzhou Industrial Park  
Suzhou, Jiangsu 215126, China  
+86.512.8816.8000

#### Shanghai

Meiheng Building  
369 Wuzhong Road  
Minhang District  
Shanghai 201103, China  
+86. 21.5426.2525

