AEROFIN

Heat Transfer Products

CUSTOM AND SPECIALTY HEAT-TRANSFER PRODUCTS

designed and constructed to stringent ASME requirements including Section I ("S" Stamp), Section III ("N" Stamp, Class 1, 2 or 3) and Section VIII ("U" Stamp).

U S R PP N NPT NS

AEROFIN
Heat Transfer Products

SPECIALIZING IN HEAT TRANSFER TECHNOLOGY SINCE 1923.

Founded in 1923, Aerofin is a leading manufacturer of spiral fin and plate fin heat exchanger coils and related heat transfer equipment such as:

- process gas coolers/heaters
- transformer oil coolers
- fin-fan units
- integral face & bypass coils
- frames for coil removal capabilities and airside transitions.

Aerofin products serve a variety of industries, including:

- industrial process
- fossil fuel power generation
- nuclear power generation
- pulp & paper
- automotive
- petrochemical
- HVAC

Aerofin evaluates each installation using our customizable performance and sizing software, which accommodates practically any heat transfer medium. We design and fabricate coils to virtually any size and configuration using a wide array of construction materials.

Aerofin's home office and manufacturing plant has been located in Lynchburg, Virginia since 1966. With more than 150,000 Ft^2 of production area, Aerofin has the capability to supply the custom finned heat exchanger to meet any application.

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UNCOMPROMISING STANDARDS... FROM DESIGN THROUGH DELIVERY.

Today's industrial markets require heat transfer equipment that is larger and more rugged, but which still maintains high efficiency. That is why Aerofin places a strong emphasis on innovation, engineering expertise, custom design, and quality.

Aerofin's extensive experience is an important part of the design and engineering process. Each fully customized coil is a unique combination of proven design and state-of-the-art construction methods. Every application receives the same standards of excellence in manufacturing, design, and engineering.

By evolving into a leading manufacturer of heavy duty coil applications, Aerofin can proudly offer these and other specialty coil types:

- **COMBUSTION AIR PREHEATERS**
- **FLUE GAS HEAT RECOVERY COILS**
- **FLUE GAS REHEATERS**
- **WALL HEATERS**
- **DE-SUPERHEATERS**
- **ECONOMIZERS**
- **OIL COOLERS**
- **POCKET VENT HEATERS**
- **HYDROGEN COOLERS**
- **FLUID BED HEATERS**
- **TURBINE INLET COOLERS / HEATERS**
- **MOTOR COOLERS**
- **PROCESS GAS COOLERS / HEATERS**
- **WASTE-TO-ENERGY COILS**
- **SUB-COOLERS**
- **GENERATOR COOLERS**
- **IN-BED DRIER COILS**

FINNED TUBING

Aerofin manufactures finned tubing in multiple sizes and materials with the flexibility to meet applications involving high fluid flow rates and temperatures exceeding 750°F. Materials include aluminum, copper, copper-nickel, carbon steel, stainless steel, inconel, duplex stainless or any other specialty material suitable for the application. Tube thicknesses and diameters are determined using customer-specified design requirements for pressure, temperature and service.

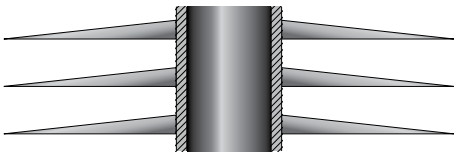
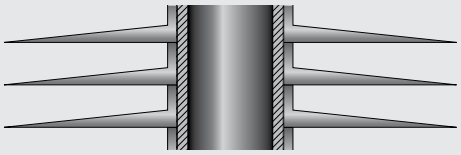
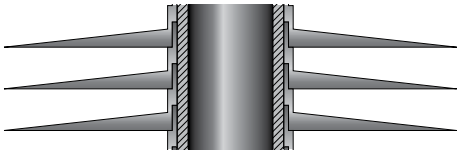
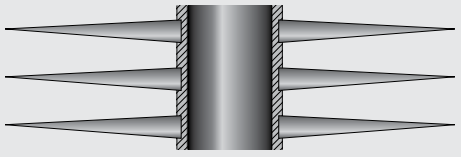
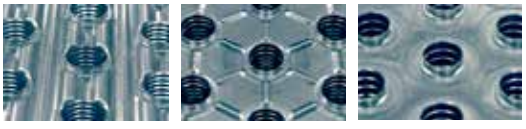
Aerofin offers a variety of coil surfaces consisting of both helically wound and plate style fins.

HELICALLY WOUND FINS are smooth providing low air side resistance with a fin spacing range designed to optimize efficiency. The helically wound fin design allows each tube to be individually finned offering a distinct advantage in customization. Individually finned tubes allow the coil to have the tube and row centers spread. This affords the flexibility to design for low airside resistance and extreme air side fouling applications requiring periodic cleaning.

PLATE FINS are smooth or corrugated, offering higher efficiencies at a slightly higher air resistance in a fin spacing range of 5 to 14 Fins Per Inch. Plate fins are permanently attached to the tubes by expansion of each tube. Full fin collars allow for both precise fin spacing and maximum fin-to-tube contact. Three styles of plate fins are offered to maximize heat transfer efficiency by providing the most square footage of heat transfer within a given cross sectional area.

Aerofin finned-tubing fabrication.

Aerofin offers a range of fin options to meet design requirements of even the most challenging applications.

Fin Type	Fin Thickness	Available Materials	Maximum Surface Temperature*	Example
Edgewound Fin	0.010" to 0.020"	Copper and aluminum. Tin coatings available.	Up to 400°F	
Footed "L" Fin	0.012" to 0.020"	Copper, aluminum, and carbon steel.	Up to 400°F	
Overlapped Footed	0.012" to 0.020"	Copper and aluminum.	Up to 600°F	
Embedded	0.015" to 0.030"	Copper, aluminum, carbon steel, and stainless steel.	Up to 750°F	
Plate Fin	0.0075" to 0.016"	Copper, aluminum, carbon steel, and stainless steel.	Up to 400°F	 Wave Fin Star Fin Flat Fin

**Maximum surface temperature is determined by considering both the inlet fluid and inlet air temperature.*

HEADERS AND CONNECTIONS

Headers are typically round pipe barrels or fabricated boxes that incorporate round pipe connections which allow fluid to pass through to the finned tubes.

Pipe connections can be provided with a number of different connection styles, including male pipe threads (NPT-M), plain or butt weld ends, Victaulic groove or flanged.

Pipe barrel headers are most commonly used unless high fluid flow rates are required, or unless the application demands regular internal header and tube maintenance. For these applications, an Aerofin fabricated box header is designed with a tube sheet and box enclosure fitted with either a plugged plate or removable cover plate.

The plugged plate design (PDRP) comes equipped with removable plugs opposite every tube. The plugs provide access for internal inspection, cleaning or for plugging an individual tube. The removable cover plate design (PDRC) allows the fabricated box header cover to be unbolted and removed from the box, providing access to the tubes for internal inspection, cleaning, or for plugging an individual tube.

With both design options, the coil end opposite the connections (Blind End) can be fitted with return bends for circuiting the fluid throughout the coil, or with an additional fabricated box when access to both ends of the coil is required.

TUBE-TO-HEADER AND TUBE-TO-RETURN BEND JOINTS

Aerofin offers several methods for joining tubes-to-headers and tubes-to-return bends. When selecting the proper joining method, consideration must be given to the design pressure and temperature, materials of construction, operating environment and code requirements. Available joint types include silver brazing, welding and torque-controlled roller expansion. Coils which have a pipe barrel header design will require either brazed or welded joints, whereas coils with fabricated box header designs will typically have roller expanded tube-to-header joints. As an added option, tube-to-header joints may be silver brazed or welded after the roller expansion process.

The method of joining tubes-to-return bends is also dependent on the same factors as described above, however, the choices are limited to brazing or welding. In certain cases, the tubes and return bends can be provided in a single, formed piece referred to as a hair-pinned tube which eliminates some or all of those joints.

Hairpinned tube, eliminating return-bend joints.

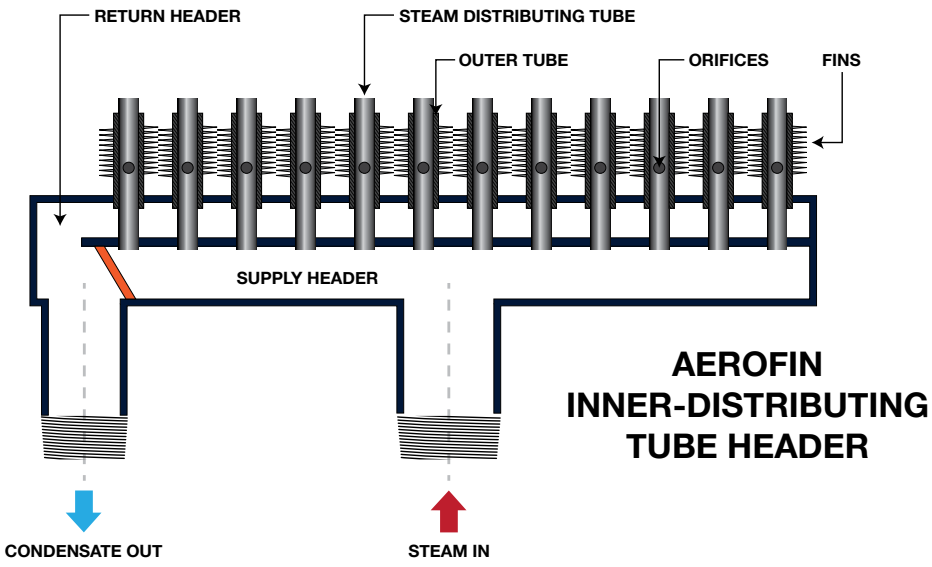
Hairpin, as installed.

INNER DISTRIBUTING TUBE STEAM COILS

Inner distributing tube steam coils are commonly referred to as "non-freeze" coils.* The "non-freeze" nomenclature refers to the inner distributing tubes capability of protecting the condensate from freezing when dealing with inlet air temperatures below 32°F. As shown in the figure below, this tube-within-a-tube design delivers steam through a smaller inner tube inside the outer finned tube. The inner tube has orifices located radially to distribute steam evenly along the length of the coil. This allows for more uniform heating while the temperature of the saturated steam keeps the condensate from sub-cooling inside the coil, especially when modulating the steam flow for low load conditions.

The inner distributing tube design also incorporates a unique side-by-side header arrangement that uses the steam supply header section to keep the condensate-return header section warm while condensate passes from the coil to the return piping.

Installation is simplified by allowing the coil to be installed level. By pitching the tube bundle inside the casing and allowing gravity to assist the removal of condensate, Aerofin's inner distributing tube steam coil permits various installation arrangements. These installation options can include horizontal tubes with horizontal air flow, horizontal tubes with vertical air flow, or vertical tubes with horizontal air flow.



AEROFIN INNER-DISTRIBUTING TUBE HEADER

**Freezing of any steam heating coil will occur when the piping system fails to remove the condensate properly. Since it may be necessary to reduce the inlet steam pressure in order to secure a wide range of operating points, particular attention should be paid to the return piping to ensure that the coil is completely drained. A piping professional's guidelines will address particular situations or possible alternatives to meet individual site requirements. Condensate that is not properly removed from any steam coil can result in premature failure due to freezing or water hammer. Steam coils must have provision for venting non-condensable gases which are removed from condensing steam. A buildup of non-condensable gases will reduce the overall heating capacity, and may cause system corrosion in the presence of air and carbon dioxide. Aerofin does not warrant against corrosion, erosion, abrasion, water hammer, or freezing.*

FRAMES, HOUSINGS & TRANSITIONS

Every Aerofin coil is provided with a casing system designed to support the finned tube bundle, headers, and return bends while isolating them from external forces. In addition, each casing provides allowances for thermal expansion and contraction.

Coil frame housings and inlet/outlet transition pieces are available with any Aerofin coil to allow for easy access and economical maintenance. Frame housings are designed to be welded or bolted into the ductwork, permitting individual coils to be removed, like a drawer, without disturbing the duct work or external piping. The coil envelope and casing are designed to fit inside a newly fabricated or existing outer frame housing. When coils are being replaced from an existing outer frame housing, each new coil will be shipped complete with a cover plate for sealing into the existing frame.

Inlet/outlet transition pieces are used to transition from the system ductwork to the Aerofin equipment. These transition pieces are integrated with the frame housing and welded air-tight to the specified duct pressure. Although Aerofin's outer frame housing and transition pieces are welded air tight, they are visually inspected but not tested, unless otherwise specified.

Aerofin's outer frame housings and transition pieces can be fabricated from a variety of material options including aluminum, carbon steel, stainless or other specialty materials.

QUALITY ASSURANCE

Aerofin's dedicated factory quality control department reviews all details of an order and verifies that every step in the manufacturing process complies with ordered requirements and Aerofin's own stringent design standards. All ASME inspections are performed by a full-time third-party authorized inspector.

Every coil fabricated by Aerofin is leak tested before shipment. Testing requirements vary depending upon the application, customer specifications, and ASME Code requirements.

					
PDRC	**PDRP**	**LRB**	**ASH**	**CH**	**FLEX**
Fabricated box header with removable cover. Designed for use with hot water, glycols, etc., it is generally employed for oil, gas, process, and jacket water cooling. This coil features a removable cover plate. When removed, the tubes are exposed for inspection and cleaning. Supply and return connections can also be located on the side of the header box to eliminate disturbing the piping. These are available in designs for any high pressure/ temperature design.	Fabricated box header with removable plugs. These are compatible with hot water, glycols-oils, gas, and steam. Advantages of this header box include removable plugs and easy tube cleaning. These are available in designs for any high pressure/temperature design.	Large return-bend coil. Utilizing one inch or larger O.D. tubes with return bends, these coils are available in removable core configurations as shown. Although generally used in a boiler air preheat application, this coil readily handles large quantities of a heating or cooling fluid. High pressure/temperature designs are available with special sizes and configurations to meet specific needs.	Inner-distributing tube steam coil. Heat exchanger with wide-range modulation, while still maintaining even air temperatures off the coil without producing cold spots. These coils have a concentric inner tube with orifices that distribute steam along the inside of the outer tube. The opposite tube end is free to expand and contract independent of the frame and adjacent tubes. Available with removable core configurations, with the coil easily removed from a fixed, airtight frame. Tubes are pitched in the casing for horizontal or vertical airflow to promote condensate drainage.	Standard return-bend coil. They can be used for steam, hot water, glycols, or other fluids. They utilize return bends, providing supply and return connections on the same end of the coil. The core can be removed from the airtight outer frame. These are available in designs for any high pressure/temperature design.	Flexible-tube coil. Provisions are made by using an offset formed tube construction that allows for thermal expansion and contraction. They are generally supplied with heavy gauge casings that are welded airtight for use with bolting or welding into place. Steam and condensate connections are located on opposite ends. To repair an individual tube, simply cut and remove the damaged section and replace it.
TUBE DIAMETER					
5/8" and larger	**5/8" and larger**	**1" and larger**	**1" and larger with concentric inner tube**	**5/8" and larger**	**5/8" and 1" flexitube**
ROWS					
1 or more	**1 or more**	**1 or more**	**1 or 2**	**1 or 2**	**1 or 2**
SERVICE					
Liquid or Steam	**Liquid or Steam**	**Liquid or Steam**	**Steam**	**Liquid or Steam**	**Steam**
APPLICATIONS					
Heating or Cooling	**Heating or Cooling**	**Heating or Cooling**	**Heating**	**Heating or Cooling**	**Heating**

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