



United heat transfer pvt. Ltd.

Transformation of energy with safe & efficient design



AIR COOLED HEAT EXCHANGERS

[] COMPANY PROFILE

United Heat Transfer is an ISO 9001:2015 Certified Design & manufacturing company with a wide range of products like Shell & Tube Heat Exchangers, Extended Surface Heat Exchangers, Air Cooled Heat Exchangers, Charged Air Coolers, Pressure Vessels, Process Equipment & Skids.

We have 'U', 'R', 'NB' Certifications. We have exposure to CE marking also. Our registration EIL and authorization from IBR have added advantages.

Established in the year 1995, UHT has since extending its expertise & expanding with the growing OEM industries. Our emphasis is on consistent high quality products supported by well trained work force.

[] AIR COOLED HEAT EXCHANGERS

An Air Cooled Heat Exchanger is a device for rejecting heat from a hot fluid directly to ambient air. Air Cooled Heat Exchangers are commonly used in industrial applications where there is scarcity of water as a cooling medium.

Air cooled heat exchangers are favoured compared to water cooled due to following:-

- Low cost of cooling media.
- Low capital investment
- Low maintenance cost
- Compact in size
- No cost of treatment of disposal like in water cooler

[] DESIGN & ENGINEERING

Our Air Cooled Heat Exchangers are designed to fulfil needs of various combinations of Pressure, Temperature, Corrosion & Fouling. The quality of Air Cooled Heat Exchangers is a result of advanced & latest design software, world class fabrication facilities & capabilities.

Thermal Design

Thermal design is carried out to meet customer service requirements taking care of the following Constrains:-

- Space Limitations
- Fouling From Operating Fluids
- Pressure Drop Limitations
- Fluid induced vibrations
- Optimum Design

This is achieved by the Design Software "HTRI" which is part of our Design & Engineering Facilities. HTRI gives us

- Strong Database
- Quick Thermal Calculations
- Phase Change Graphs
- Vibrations Analysis



Application of air cooled Heat Exchanger:-

- Gas compression package
- Gas transmission facilities
- Large engine radiators
- Condensing of refrigerant gases
- Power plants, steam condensers
- Turbine lube oil cooler
- Flue gas reactors



Mechanical Design

Mechanical Design is carried out using various international codes & standards. Following are some of the major codes & standards used by us:-

- ASME Section VIII, Div.-1, Div.-2
- IS 2825
- IS 4503
- WRC Bulletin 107 & 297
- ANSI B16.5
- API 660, API 661

The strength calculations based on above codes and standards are carried out by means of Bentley AutoPIPE Vessel software and the following analysis is done.

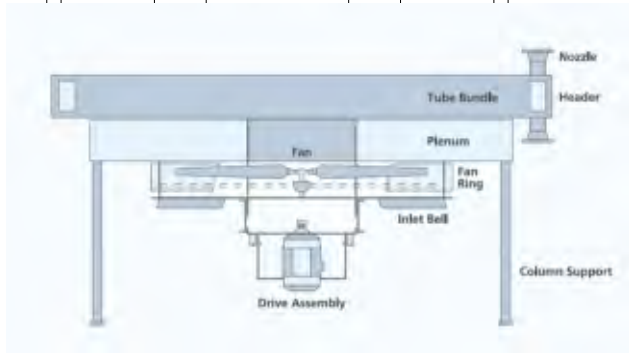
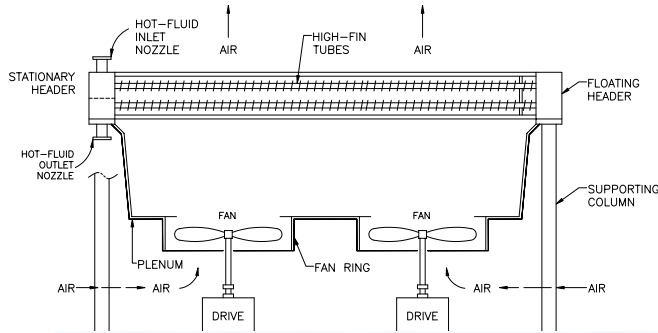
- Local Stress Analysis (Nozzle Load Calculations)
- Wind & Seismic Analysis
- Thickness Calculations
- Support Calculations



QUALITY ASSURANCE

Products are backed up by comprehensive technical documentation for quality and safety, including:

- Material Certification
- Welder Qualifications and procedures
- Non-Destructive Testing Reports
- Third Party Inspection Reports
- Pressure Testing Certification
- Operating and Maintenance Instructions



Induced Draft

The Induced Draft design has the fan above the bundle and the air is pulled across the finned tube surface

Induced draft is useful for:-

- Better distribution of air across the bundle.
- Steady & durable thermal performance.
- Less hot air recirculation
- Less Fouling.
- Lower Noise.

CONSTRUCTION

Air Cooled Heat Exchanger consists of the following components:

- One or multiple tube bundles for heat transfer.
- An air-moving device, such as a fan, blower, or stack.
- Unless it is natural draft, a driver and power transmission to mechanically rotate the fan or blower.
- A plenum between the bundle or bundles and the air-moving device.
- Optional header and fan maintenance walkways with ladders to grade.
- Optional louvers for process outlet temperature control.
- Optional variable pitch fan hub for temperature control and power savings.
- Optional recirculation duct/chambers to protect against freezing/solidification of fluids in cold weather
- A support structure high enough to allow air to enter beneath the air cooled heat exchanger.

Tube Bundle

A tube bundle is an assembly of tubes, headers, side frames, and tube supports. Usually the tube surface exposed to the passage of air has extended surface in the form of fins to compensate for the low heat transfer rate of air at atmospheric pressure and at a low enough velocity for reasonable fan power consumption.

OPERATION

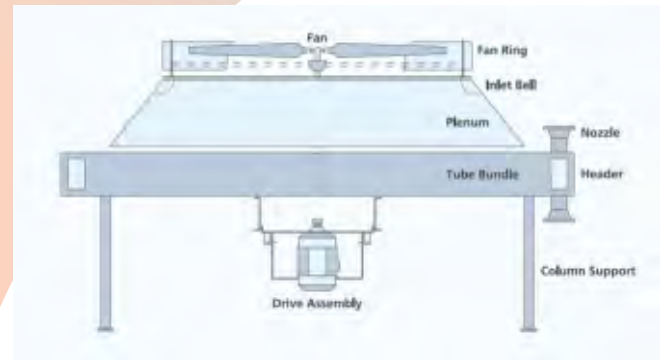
The hot process fluid to be cooled flows through a tube while cooling air flows across outer surface. The cooling air is propelled by fans in either a forced draft or induced draft configuration. Specially designed fins attached to the outer surface of the tube creates a large surface area for effective performance. The heat transfer rate is a function of fin's surface area & the velocity of air flow.

Forced Draft

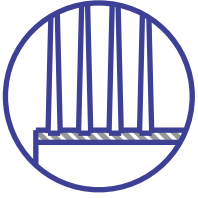
The forced draft unit pushes air across the finned tube surface. The fans are located below the tube bundles.

Forced draft is useful for:-

- Low capital cost.
- Better accessibility of fans & upper bearings for maintenance.
- Accommodates higher inlet temperature

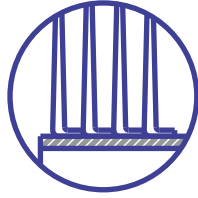


We use following types of applied finned tubes & plate fines.



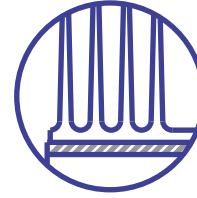
G-Fin (Embedded)

- High efficiency
- Higher operating temp. (Up to 400 C).
- Rectangular C/S fin wrapped in tension & embedded in 0.25 mm deep groove.
- Applicable on any tube material.



L-Fin (Wrapped/Footed)

- Low temp. (Upto 70 C)
- L-shaped fin wrapped in tension over the tube with tube covered by the feet between the fins.
- Applicable on any tube material.



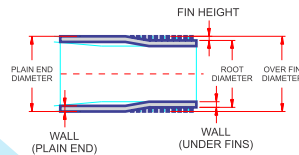
Extruded Fin (Integral)

- High efficiency
- Higher operating temp. (Up to 300 C).
- Fins are formed by extrusion mechanically bonded to an inner tube or liner.
- Applicable on any tube material.



Overlapped Footed Fin

- Low temp.(Upto 180 C)
- L-shaped fin wrapped in tension over the tube with tube covered by the feet between the fins.
- Applicable on any tube material.



Stud Fin

- Studs are welded to tube by resistance welding producing strong bond.
- Very high pressure & temp. applications,
- For Petrochemical & refineries.

Integral Low Fin

- Used when extended surface is required.
- Improved thermal performance without changing flow arrangements.
- Fin density 19 to 26 fins per inch.

Plate Fin (Continuous)

- Stamped to shape/ size.
- Large surface area compared to spiral fins.
- Used in air heating application to reduce size of equipment.
- Similar/dissimilar tube & metal combinations.

Soldered Fin Tube

- Moderate temp. (Upto 200 C)
- Types - Root solder & Solder coated.
- Root soldering create bond between tube & base of fin.
- Solder coated fin covers the entire fin and tube surface with suitable alloy.

[] MATERIAL OF CONSTRUCTION

- | | | | | | |
|-----------------|-----------------|--------------|-------------|-----------|----------|
| Stainless Steel | Aluminum | Cupro-nickel | Naval Brass | Brass | Monel |
| Carbon Steel | Aluminum Bronze | Copper | Inconel | Gun Metal | Hastolly |

[] THIRD PARTY INSPECTION AGENCIES

- | | | | | |
|----------|-----------------------|---------|--------------------|------|
| ABS | Lloyd's Register Asia | EIL | CEIL | RINA |
| TUV Nord | Bureau Veritas | TUV SUD | DGQA, QAE WE(Pune) | IRS |
| ICS | IQS | Technip | TPL | IBR |
| TOYO | Saipem | Jacob | VELOSI | Uhde |

[] CERTIFICATES



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