UNITED HEAT TRANSFER

COMPANY PROFILE

We have 'U', 'U2', 'R', 'NB' Certifications.

Established in the year 1995, UHT has since been extending its expertise and 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 or gas directly to ambient air. Air Cooled Heat Exchangers are commonly used in industrial applications where a reliable source of water is not available 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 as required in water cooler

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

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.

The availability of this software gives us tremendous engineering support in terms of:-

- Strong Database
- Quick Thermal Calculations
- Phase Change Graphs
- Vibrations Analysis
**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
- TEMA
- API 660, API 661

The strength calculations based on above codes and standards are carried out by means of “MICROPROTOL” software and the following analysis is done.

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

We also use the **PV-Elite** software for stress & component analysis for heat exchangers.

---

**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

---

**OPERATION**

The Hot Process Fluid to be cooled flows through a tube while the cooling air flows across the outer surface. The cooling air is propelled by fans in either a forced draft or induced draft configuration. Specially designed fins are attached to the outer surface of the tube to create a large surface area for effective performance. The heat transfer rate is a function of the fin’s surface area & the velocity of air flow.
We use following types of applied finned tubes & plate fines.

G-FIN (EMBEDDED FIN)
- High efficiency fin for higher operating temperatures (Up to 400 C).
- Rectangular cross section aluminum fin wrapped under tension & embedded in 0.25 mm deep groove, spirally cut on the tube.
- Applicable on any readily machinable tube material.

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 ducts and chambers for protection against freezing or solidification of high pour point 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.

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.

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.
L-FIN (WRAPPED OR FOOTED FIN)
- Low temperature applications (Up to 170°C), where some degree of tube wall protection is required.
- L-shaped aluminium fin wrapped under tension over the tube with the tube fully covered by the feet between the fins.
- Applicable on any metallic tube material.

EXTRUDED FIN (INTEGRAL FIN)
- High efficiency fins for temperature up to 300°C.
- An aluminum outer tube from which fins have been formed by extrusion mechanically bonded to an inner tube or liner.
- Applicable on any metallic tube material.

OVERLAPPED FOOTED FIN
- Low temperature applications (Up to 180°C)
- L-shaped aluminum fin wrapped under tension the tube, with the tube fully covered by the overlapped feet under & between the fins.
- Applicable on any metallic tube material.

STUD FIN
- The studs are welded to tube by resistance welding process producing strong metallurgical bond between stud and tube.
- Used for very high pressure and temperature applications, mainly for Petrochemical industries and refineries.

INTEGRAL LOW FIN
- Used when extended surface is required due to lack of surface area.
- Improve thermal performance of heat exchanger without changing flow arrangements or repositioning of structure.
- Fin density ranges from 19 fins to 26 fins per inch.

PLATE FIN (CONTINUOUS FIN)
- Stamped fins can be manufactured in almost any shape or size.
- These fins offer large surface area compared to the spiral finned tubes. These finned tubes are used mostly in air heating application to reduce the overall size of the equipment.
- Similar or dissimilar tube and fin metal combinations.

EDGE TENSION FIN
- For moderate duty in normal ambient air and low temperature applications. (Up to 120°C)
- Fin material is tightly wound around the tube to secure metal to metal contact of the fin with the tube.
- Edge tension fin tube available in similar or dissimilar metal combinations.
BRAZED FIN TUBE
- High efficiency fin for rigorous and high temperature applications (Upto 800°C)
- Brazed fin tube offers solid metallurgical bond between fin and tube, when the tube expands or shrinks due to temperature changes the brazed bond never relax its grip.
- Available in similar or dissimilar metal combinations.

SOLDERED FIN TUBE
- Suitable for moderate temperature applications (Upto 200°C)
- Available in two distinct types viz. root solder and solder coated.
- Root soldering involves enough solder to create bond between tube and base of the fin.
- Solder coated fin tubes covers the entire fin and tube surface with the suitable alloy.

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

TWISTED TAPE TUBE
- Swirling flow is formed using twisted tape placed inside the tube of heat exchangers which results in increased heat transfer rate.

Third Party Inspection Agencies
- Lloyds Register Ind. Services (I) Pvt.td. (LRIS)
- Bureau Veritas Ind. Services (I) Pvt. Ltd. (BVIS)
- Metallurgical Engg. Consultant India Ltd. (MECON)
- Aker Solutions
- Chemtex India Ltd.
- Tata Consulting Engineers Ltd.
- Intertech
- SGS
- TUV India Pvt. Ltd.
- Indian Register of Shipping (IRS)
- American Bureau of shipping industrial verification (ABSIV)
- CQAE(WE) (Warship Equipment)
- Projects and Development India Limited (PDIL)
- Inspection Consultancy Services (ICS)
- IBR
- Velosi

We also manufacture process equipment with CE certifications.
We also have ‘R’ Stamp for metallic repairs and alterations at site as well as field repairs.