



*An Exchange of
Your Trust with our Quality*



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UNITED HEAT EXCHANGERS ★ PRESSURE VESSELS ★ COOLING TOWERS



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COMPANY PROFILE

UNITED COOLING SYSTEMS PVT LTD is one of the largest leading manufacturers of total cooling system and EPC, in India from 1989. We established our sister concern M/s. UCS PLATE HEAT EXCHANGER ASSEMBLING LLC, a new manufacturing facility for HEAT EXCHANGER AND PRESSURE VESSELS in AL QUOZ, Dubai exclusively for Gulf operations. We are proud to inform that our company is accredited by American Society of Mechanical Engineers [ASME] for 'U' & 'S' Stamp and also 'R' Stamp by National Board. Further we are one of a ISO 9001-2008 Quality certified company and Corporate member of CTI, TEXAS. We have a first class Research and Development centre which has consistently produced innovative concepts by our qualified engineers for developing the products regularly to meet the needs of society. We are not only a product manufacturer and also complete cooling solution provider from India and Dubai with all under one roof facility.

Apart from manufacturing we are providing services after sales for heat exchanger, pressure vessels and all types of Cooling systems up to the clients satisfactory. Our company has a fully equipped infrastructure, timely and fastest delivery and 24 hours dedicated service team. Our Main goal is to help business partners find cost saving solutions and improvements that enhance for continuous growth. Our engineering and production standards often exceed general standards, the objective being to supply a prime quality product which will provide low cost and reliable service to our customers over many years.



PRINCIPLES

Heat Exchanger is a device for an efficient heat transfer between two fluid media. The two medium may be in separate paths or be in direct contact. Heat exchangers are mainly used in generators, Compressors, Process cooling like space heating, refrigeration, air conditioning, power plants, chemical plants, marine, automobile, petrochemical plants, petroleum refineries and natural gas processing, Nuclear plants, ports, Ship building centre, Railways etc. United is one of the very few companies in the world manufacturing all type of heat exchangers under one roof. The heat exchanger flow is two nature. One is co-current flow [parallel flow], second one is counter current flow [Counter flow] This heat exchangers are mainly used for reducing or increasing the heat from one media to another media.

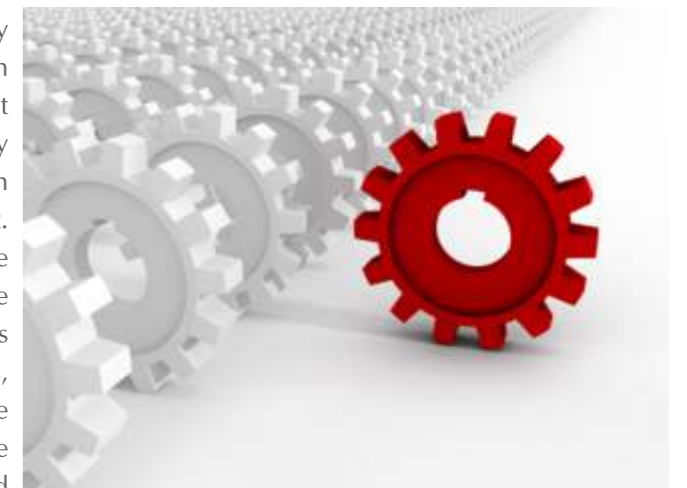


PRODUCT RANGE

Our range of products includes all types of Heat exchangers, Pressure vessels & columns, Storage Tanks Air cooled Heat exchanger, Air cooled condensers & Cooling Towers. In Heat exchangers, we have 3 types i.e., Shell & Tube Heat Exchangers, Air cooled or Finned Tube heat exchangers, Plate Type Heat exchangers.

QUALITY PROFILE

UNITED COOLING SYSTEMS (P) LTD is committed to satisfy the customer throughout our supply of quality products with continual development and improvement in its product processing systems. All components or materials are carefully selected and tested under the adverse conditions applicable in operation. It assures the quality of its each and every product. We are confident about our products and its quality for the customer's utmost satisfaction. United Heat exchangers are carefully designed, analysed and tested with latest softwares for thermal and mechanical design, selection of raw materials, witnessing of pressure testing as per specifications and the quality is tested with its own quality control departments. We outfitted with proficient engineers and employees and updated technology. Production stage is well planned and screened with our production planning dept. Our products undergo various quality checks before leaving the company premises like metallurgy, X-Ray hydraulic, Pneumatic, Penetration testing, macro, Flattening Test, thinning Test, Tensile test, Hardness, Flange test, eddy current test etc. Also third party inspection agency like DGQA, Lloyds Register, Bureau Veritas, SGS, IBR, RITES and Engineers India Are also arranged for Quality assurance based customer needs. We have NT, UT, PT, RT, MPT, NDT level qualified welders.

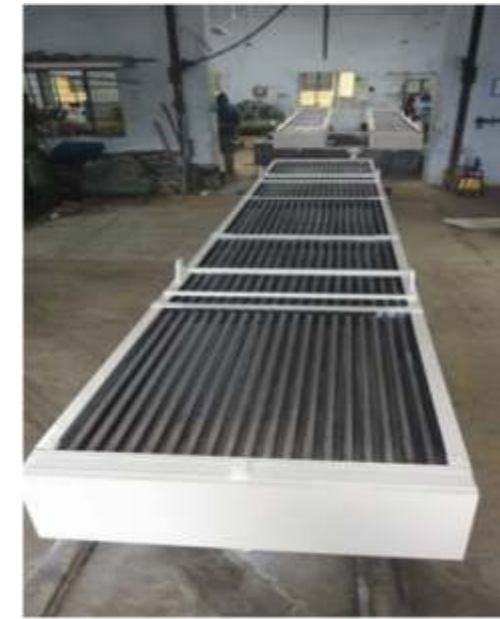


SHELL & TUBE HEAT EXCHANGER

Shell & Tube heat exchanger is an ideal solution for wide variety of applications & commonly used in all refineries, chemical industries for high pressure heat transfer processes. The tube which is main component for heat transfer, that may be either plain or finned tube. The tube material should have good **thermal conductivity** because the tendency of the tube material to thermally expand differently at various temperatures **thermal stresses** occur during operations. The tube material also should be compatible with both the shell and tube side fluids for long periods under the operating conditions to minimize deterioration such as **corrosion**. U-tube heat exchanger are bent in the shape of U. Fixed tube sheet heat exchanger has straight tubes that are secured at both ends to tube sheets welded to the shell. Floating head heat exchanger is most versatile type of exchanger. All of these requirements call for careful selection of strong, thermally-conductive, corrosion-resistant, high quality tube materials, typical **metals** in all grades of **titanium, copper alloy, stainless steel, carbon steel, non-ferrous copper alloy, Inconel, nickel, Hastelloy**. One medium flow inside the tubes and other medium flow over the tubes inside the shell side i.e., the tube wall acts as a barrier between hot & cold fluid. The medium can be either liquid or vapour phases on either the shell or the tube side. UNITED is manufacturing all types of shell & tube heat exchangers as per the TEMA class-“R,C,B” & ASME Sec VIII Div 1 & 2, TEMA Codes & Standards. There can be many variations on the shell & tube design, U tubes & straight Tube (single pass, Dual pass & multi pass). It may depend upon the industrial operation. One of the big advantage of using a shell and tube heat exchanger is often easy to service, For heating or cooling fluids and gasses to precise temperatures in specific timeframes, **shell and tube heat exchangers** are a very common and logical process solution.



AIR COOLED OR FINNED TUBE HEAT EXCHANGER



Air cooled or finned tube heat exchanger is an ideal solution for cooling down high heat medium where availability of water is considerably very low or scarce. United finned tube heat exchanger implements the European technology of spirally wrapping continuous strip of fin material around the tubes. More surface area can be accommodated in a lesser compact area, which is possible in this model heat exchangers. Air Cooling heat exchangers are designed with a series of multiple rows of finned tubes on a surface along with a number of fans to move large amount of atmospheric air to cool the medium inside the tube. The presence of fin material helps to increase the heat transfer area for higher efficiency. Exchanger is made out of custom required material and TEMA standards like seamless or ERW. Types of Finned tubes are '**L' Finned tube** type, LL finned tube as way as '**L' finned tube** type except that the fin foot is overlapped to completely enclose the base tube thereby giving excellent corrosion resistance, KL Finned tube exactly as '**L' finned tube** except that the base tube is knurled before application of the fin foot. G embedded finned tube-The fin strip is wound into a machined groove and securely locked into place by back filling with

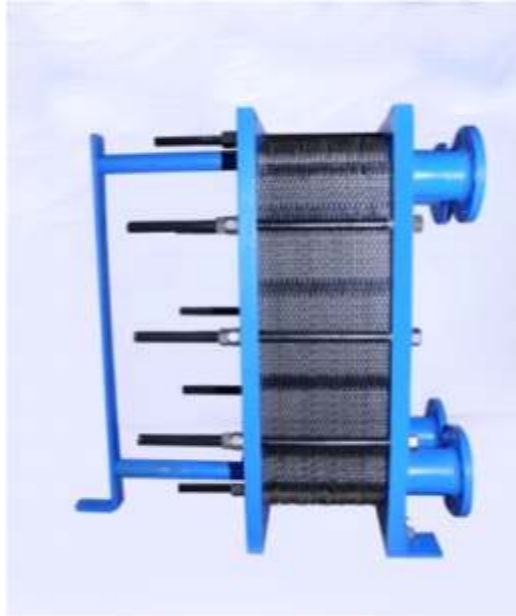
base tube material. This Extruded finned tube is formed of bi-metallic components where tube and fin materials are of different metals. The fin is formed by rolling material from of the exterior tube to give an integral fin with excellent **heat transfer** properties and longevity. **Extruded fin** offers excellent corrosion protection of the base tube. The end of the tubes are probably welded or expanded with grooved tube plates by tube expanding machines up to a pressure level of 15000 PSI Pressure. Designed and Fabricated as per ASME Sec VIII Div 1 & 2, API 661 Codes & Standards. The air cooled heat exchangers are also known as dry cooling tower, Fin fan cooler, air fin cooler. These air cooled type heat exchangers are used in oil, gas, refinery, process industries, Gensets, Furnaces, oil and gas, Refinery, Petrochemical and power plants and condensation plants. All type of fluids in process industries are cooled in air fin coolers with the use of atmospheric air as the cooling media which resulting in running costs economically low and water saving too. This can be used in high pressure high temperature applicants. Nil water loss and negligible level of maintenance is a credit for this type heat exchanger.

UCSPL also supplies Pre-assembled modules



PLATE TYPE HEAT EXCHANGER

Plate heat exchanger is widely used because of its high flexibility as they can use in any combination of medium. This model is highly efficient because it is having high heat transferring area comparing to volume ratio. This exchanger is also called as compact exchanger as the size is very small when comparing to other types. This exchanger can be altered to increase or decrease the heat transfer area by changing the number of plates. Easy to operate and periodical cleaning is possible. Plate type heat exchanger is also called as plate fin heat exchangers. In plate type heat exchanger Corrugated plates or finned plates are used for exchanging heat between two media. This comprises of alternative layers of corrugated sheets separated with metal plates, mainly stainless steel material. This Corrugated sheets and metal plates create a series of finned chambers closed with side bars at the edges. Separate hot and cold layers will be flowing through alternative chambers. Heat is transferred from one stream



through the fin interface to the separator plate and through the next set of fins into the adjacent fluid. As compared to shell and tube heat exchangers, the temperature approach in a plate heat exchangers may be as low as 1 °C whereas shell and tube heat exchangers require an approach of 5 °C or more. For the same amount of heat exchanged, the size of the plate heat exchanger is smaller, because of the large heat transfer area afforded by the plates, Increase and reduction of the heat transfer area is simple in a plate heat-exchanger, through the addition or removal of plates from the stack. Plate heat exchanger consists of a series of thin, corrugated plates which are mentioned above. These plates are gasketed, welded or brazed together depending on the application of the heat exchanger. The plates are compressed together in a rigid frame to form an arrangement of parallel flow channels with alternating hot and cold fluids. The plate type heat exchanger is widely used in food processing industries, dairy industries, and Distilleries.

AIR COOLED CONDENSER

ACC directly condenses the steam turbine exhaust flow and returns condensate to the boiler without water loss. The steam is directly condensed inside air-cooled finned tubes without using an intermediate surface condenser. ACCs are used in utility, industrial and renewables markets for large and small size plants. These ACC is mainly used in power plant steam turbines and also wherever necessary to condensate the steam for re use. This is mainly used to re use the steam condensate water as heated feed water again to the boilers, which saves water, energy and money.



ACC Features

- ▲ High efficiency finned tubes
- ▲ Free-expansion tube bundles
- ▲ A-framed supported tube bundles
- ▲ Low hot air recirculation design
- ▲ Air Cooled Condenser supporting structure in concrete or steel
- ▲ Low noise design for near and far field
- ▲ High wind designs



PRESSURE VESSELS & COLUMNS

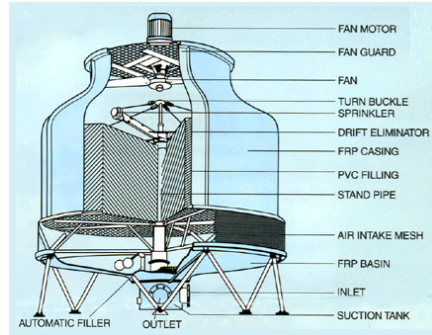


Pressure vessel & columns are used in all refineries for tremendous build up of pressure associated with increase in temperature. Pressure Vessels & Columns are used in Process Industries like Chemical, Pharmaceuticals, Paint & Coatings, Resin Plants, Biotech industries etc. Our design department will study customer's special process requirements, According to that we design, manufacture and supply the vessels & Columns. We are well experienced thermal and mechanical design team to suit customer needs.

- ▲ Designed and Fabricated as per ASME Sec VIII Div 1 & 2, PD 5500 Codes & Standard
- ▲ Material of Construction: Titanium, SS304, SS304L, SS316, SS316L, Duplex Steel or Carbon Steel, brass, Cupro nickel, Nickel aluminium brass, copper etc.
- ▲ Operating range, Pressure – full vacuum to 100 Kg/cm²



COOLING TOWER DIVISION



UNITED COOLING SYSTEMS the name implies we unite every cooling requirement under one roof. United Cooling Towers is one of the world's largest cooling tower manufacturer, Apart from that we are providing lifelong solutions for our customer needs that includes renovation, servicing, re-modelling of your existing any brand cooling towers which comprises periodical maintenance and services for better performance, our wide product range includes cooling towers, We proved ourselves as the ultimate cooling profession According to our clients requirements we are manufacturing all types of cooling towers. Apart from this also provide tailored solutions according to customer needs based on location and atmospheric conditions.

PRODUCT PROFILE

Cooling tower is a heat rejecting device. It extracts waste heat generated and exhausts it to the atmosphere. Cooling towers either use evaporation of water to remove the processed heat and cool the working fluid or solely rely on the air for removal of heat. The principle of a wet cooling tower is by using small portion of circulating water by evaporation, the remaining water is cooled. The heat transferred from water to the air stream increases the air temperature and humidity, the hot air moves up and is discharged to the atmosphere. The common applications of cooling towers include cooling The circulating water used in all process applications like, Thermal, textile, generator, compressors, cement, sugar, air conditioning, refrigeration, steel, natural gas, pharmaceutical, oil refineries, chemical plants, power plants etc. Cooling tower is one of the important cooling product in a cooling system. BY function it is divided into cross flow, Cross flow, induced draft wet cooling towers and dry cooling towers and by natural it is called fanless or natural draft cooling towers. The above models are manufactured based on CTI standards.



QUALITY PROFILE



UNITED COOLING SYSTEMS committed the quality and continual developments of its each & every product to its customer's utmost satisfaction. We are confident about products and its quality for uncompromised quality, durability, and its performance. Each component is checked from procurement of raw material to packed condition at various stages of continuous quality control systems and we make sure that each adds an advantage to our product.. We are providing dual seasoning for Timber tower. We outfitted with proficient experienced engineers and employees and updated technology. Production stage is well planned and screened by

our production planning team for scheduled delivery, exact capacity and validation of its outcome. Our products undergo various quality checks before leaving the company premises. Apart from this we believe that our services extent after sales too and we are happy to make our customer satisfied back borne strength of our company is attending all service calls immediately to solve the problem on the spot. By construction of material, all wet cooling towers are called FRP cooling tower, Timber cooling tower, RCC cooling towers. By operating cooling media, it is called wet and dry cooling towers. The dry Cooling towers are nothing but a air cooled heat exchanger or fin fan cooler.



FRP COOLING TOWERS



FRP Cooling towers are produced with Fiber Reinforced Plastic materials with resin. It is double stronger than steel and wood and by weight 60% less than it. It is resistant to chemicals. It is highly durable and cost effective. Comparing with Timber cooling towers, FRP Cooling Towers are lesser maintenance. FRP Cooling Towers intakes the air form bottom and discharge the waste heat at the top permitting water droplet more contact time with air by counter flow operation. The wet cooling towers are cooled with the help of evaporating some proportionate quantity of circulating water. Three types of FRP towers by operation are available ie., Counter flow method, Cross flow method and natural draft (Fanless) FRP cooling towers. By shape wise bottle type

(Round) and Square type Cooling towers are available.

Adjustable pitch, Aluminium (LM-6) or epoxy coated FRP Fan Blades are directly mounted on the Electric motor (IP55, with Stainless steel/ eN-8 shaft, TEFC Special type Cooling Tower Motor) to avoid excess power consumption and unnecessary gear driven wear and tear problems. All moving parts can be easily approached from top. Smaller capacity readymade cooling towers are factory assembled and just on site bolting is enough. However higher capacities are assembled into the site only to avoid excess transportation cost. Our range includes 10 TR to 5000 TR in single cell and multiple cells are used for further capacities.

FRPs mainly used in Diesel Engine Generators, Compressors, Induction Furnace, Air Conditioning and Refrigeration Suppliers, Plastic Machinery, Pet bottle machines, Induction Heating Machines, Injection Moulding machine, Hydraulic Oil Cooling Purposes, Chemical Processing industries, Pharmaceutical industries, Paper mills, Textile mills, Sugar industries, etc



1. COUNTER FLOW TYPE COOLING TOWERS



In this Cooling towers, water and air moves in opposite counter flow direction. Air enters an open area beneath the fill layer and it moves up. Water is sprayed through pressurized nozzles / or self-propulsion type sprinklers (only in bottle shape towers) placed above the fill layer and the water passes down through the fills, opposite to the air flow. The hot humid air is discharged at the top and cooled water is collected at the bottom of the tower. In this model water and air contact time is more and effective. Counter flow FRP Towers are available in both square and bottle shape.

2. CROSS FLOW TYPE COOLING TOWER



Cross flow cooling tower air flow is perpendicular to the water flow. Air enters through one or more vertical faces of the Cooling tower to meet the fill material. A distribution or hot water basin consisting of a deep pan with holes or nozzles in the bottom is utilized in a cross flow tower. Gravity distributes the water through the nozzles uniformly across the fill material. The air continues through the fill and thus pass the water flow into an open plenum area and exhaust at the top. Cross flow type is available in Rectangular shape.

FANLESS COOLING TOWER

United manufactures Fan less Fill less FRP Cooling tower which requires less power and maintenance. Fanless towers doesn't require fan and fills. It follows the principle of evaporative cooling. In this process the hot water is bring into direct contact with the dry atmospheric air. Water is cooled by converting a small portion of water into vapour, where latent heat of water is carried away by air. For discharging the hot temperature air Fanless Cooling towers employs natural draft method. The towers are aerodynamically designed features of fan less Cooling system are:



- ▲ Less Power consumption
- ▲ Consistence cooling and maintenance free as it is fanless and fillless.
- ▲ Natural draft method provides better cooling and energy saving.

TIMBER COOLING TOWERS:



In Timber Cooling towers that tower is constructed with timber. It is mainly used in chemical plants, air conditioning plants, induction furnace, injection moulding machine, chilling plants, oxygen plants, major process water cooling, power plants, refineries, sugar industries, diesel generating sets and heat exchangers. And also for steel industries, cement industries, chemical industries and water effluent treatment plants. We are mainly manufacturing cross flow type timber cooling towers.

In cross flow method the air and water flow are in perpendicular direction as like the same FRP cross flow cooling towers. The air

intake can be one sided or double sided. The water is distributed by even distributing target nozzles by gravity saving the pumping cost. The mechanical fan sucks out the hot moist air to the atmosphere. It is having the highest Delta – T with better thermal performance and lower maintenance cost. The model can be constructed according the site condition and the quantity of water cooling can be increases by extending its volume. The timber used is high quality seasoned chemically treated light wood. Comparing with all type of Cooling towers, timber towers will give the lowest possible cold water outlet.



Certificates

