



# **AEROTECH ENERGY PVT. LTD.**

**MANUFACTURING & EXPORTERS OF ALL TYPE OF  
COOLING TOWER & ENERGY EFFICIENT AXIAL FLOW FANS**

An ISO 9001 : 2008 & ISO 14001 : 2004 Certified Company



**Cooling Tower in a Process Industry is a Vital Part of the Production Process.  
We aim to achieve Trouble Free Operation of Tower with Minimum Operating and Maintenance.**

## Vision

**To Provide Engineering Solutions for Consistence Performance & Improved Efficiency.**

## Mission

To Maintain high level of Quality and Service, Continuously Improving our Products using best available Technology and set Standard in Industry.

## “ Customer Focus

Aerotech continuously strives to fulfill customer needs in terms of performance, timely delivery & cost effective solution. ”



## Objectives

**AEROTECH** introduce the performance potential for the cooling tower technology by completing the Cooling Tower Project: Identify and partner with a utility company that has an existing CT, which is under performance. Use the technology in order to calculate thermal performance. Monitor and measure the existing CT performance. Retrofit the CT using appropriate design

## Benefits

Aerotech's technical capabilities will help to the customers to gain a perfect Cooling Towers, which will maintenance and trouble free operation

## Corporate Objective

Aerotech objective is to continuously improve with utilization of its personnel experience to the fullest to offer World-Class service knowledge & set of values gathered with client to deliver value added services. Aerotech objective have guide us in the conduct of our business professionally Aerotech has aim to be among the world's leading register generating development in international Cooling Towers

## Commitment

Anticipate, understand and full fill the expectation and need of client offer responsive, accurate, timely and customer focus service offer service with world wide coverage as "one stop shop" for cooling tower & related activity ensure that activity are performed with best of abilities in line with Aerotech policies, procedure and accreditation criteria Build, ensure and maintain world class management system to offer highest quality of services Offer services, which are independent, impartial, fair, cost competitive and of high integrity Develop leader through our trainings who are accountable for achieving business result and exemplifying values Provide employees with a satisfying and rewarding work environment Aerotech believe in practitioner's approach of people to deliver services

## The people

The quality of personnel at all level and their dynamism are the factors behind our success and growth. Our team comprises personnel of the highest caliber professional integrity. The team believes in continuously surpassing the set goals and delivering tangible result for our clients. Our priority of attracting, retaining and mentoring the most talented professionals has been and will continue to be our greatest advantage

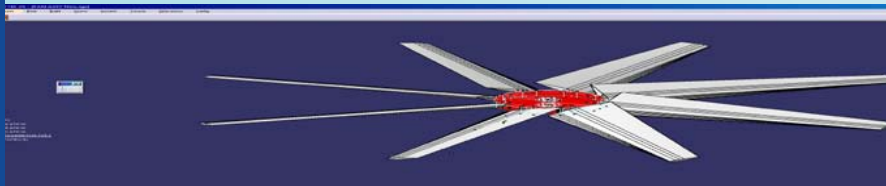
## Close to customers

Aerotech recognizes that no one understand business issues better than the people facing the competition every day. That's why we listen carefully to what you have to say about your business, concerns, objectives and needs, then we assist in providing services for optimal results.

## Credibility

The Company is Established about 2 Decades back and have Presence in all over India, East Asian Countries, Gulf and Africa. Having started with the Manufacturing of High Performance Energy Efficient FRP Fans, today we are a full service cooling Tower Company

International standards when adopted by the company, ensures clients, suppliers and end product users of universal level of quality for that particular area of Ct. The standards are designed to ensure the most effective, safe and efficient methods and products possible.



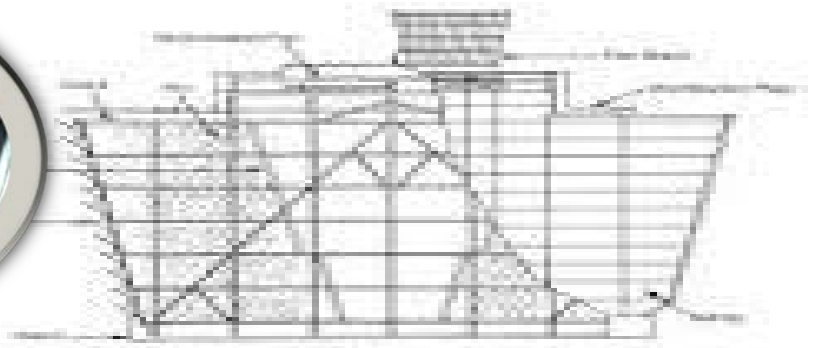
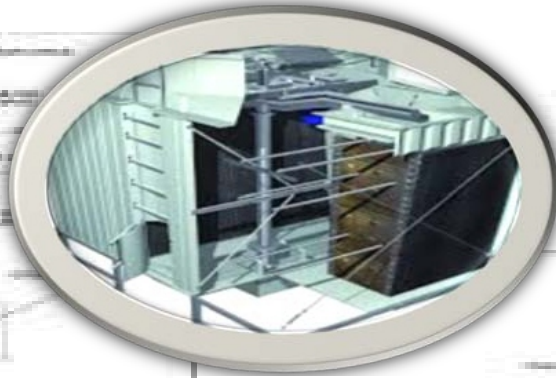
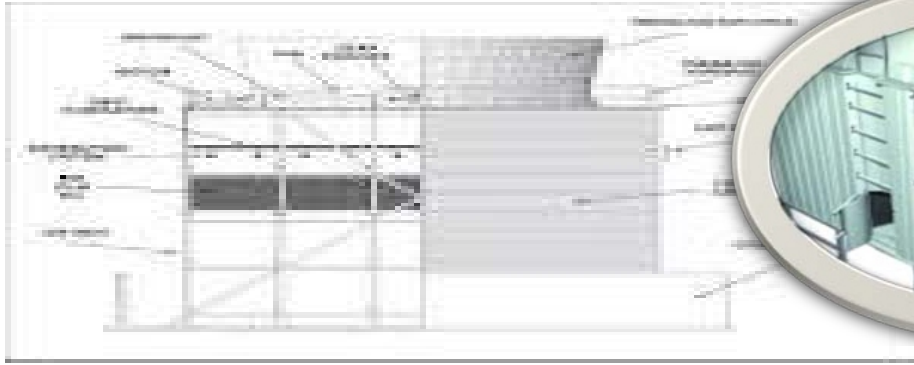


## OUR STRENGTH

A team of Engineers Having more than 2 Decades of experience in Process Cooling Towers of Various Industry like Steel, Fertilizer, Power, Cement, Sugar, Pharmaceutical etc. Under the Guidance of experts having more than 3 Decades of all round experience from Concept to Commissioning of all types of

A cooling tower is an equipment used to reduce the temperature of a water stream by extracting heat from water and emitting it to the atmosphere. Cooling towers make use of evaporation principle whereby some of the circulating water is evaporated absorbing latent heat of evaporation from the remaining water and dissipating it into the moving air stream. This process results the circulating water to cool close to the prevailing wet-bulb temperature





## COOLING TOWER THEORY

The basic function of a cooling tower is to cool water by intimately mixing it with air. This cooling is accomplished by a combination of: Sensible heat transfer between the air and the water (Conduction and Convection) and it controlled by temperature differences and area of the contact between air and water. And the evaporation of a small portion of the water. In the cooling towers, the evaporation is the most effective part in the cooling process





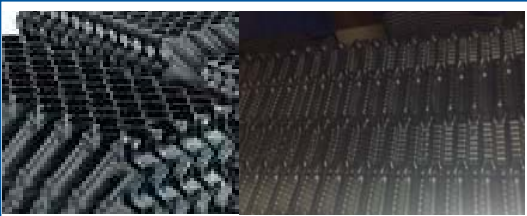
**THE NATURAL DRAFT COOLING TOWER** make use of the difference in temperature between the ambient air and the hotter air inside the tower. Since hot air rises up, fresh cool air is drawn into the tower through air inlet around the Cooling Tower. The layout of the tower is such that no fan is required



**FORCED DRAFT COOLING TOWER** air is blown through the tower by a fan located in the air inlet



**SPLASH FILL MEDIA** Splash fill media generates the required heat exchange area by splashing water over the fill media into smaller water droplets. The surface area of the water droplets is the surface area for heat exchange with the air.



**FILM FILL MEDIA** In a film fill, water forms a thin film on either side of fill sheets. The surface area of the fill sheets is the area for heat exchange with the surrounding air. Film fill can result in significant electricity savings due to fewer air and pumping head requirements.

**LOW-CLOG FILM FILLS** Low-clog film fills with higher flute sizes were recently developed to handle high turbid waters. Low clog film fills are considered as the best choice for sea water in terms of power savings and performance compared to conventional splash type fills.



**DRIFT ELIMINATOR** It is very difficult to ignore drift problems in cooling towers. Nowadays most of the end user specifications assume a 0.05% drift loss.

Cooling Towers gear box is mainly used for operating the vital functions in the cooling Towers to rotate the fans



**DRIVE SHAFT** is responsible for transferring the motor rotational power to Gearbox across some distance in between motor and gearbox



**FAN ASSEMBLIES FIBER** reinforced plastic (FRP) blades are normally hand molded which makes it easier to produce an optimum aerodynamic profile tailored to specific duty conditions. Because FRP fans are light, they need a low starting torque requiring a lower HP motor, the life of the gear box, motor and bearing is increased, and maintenance is easier



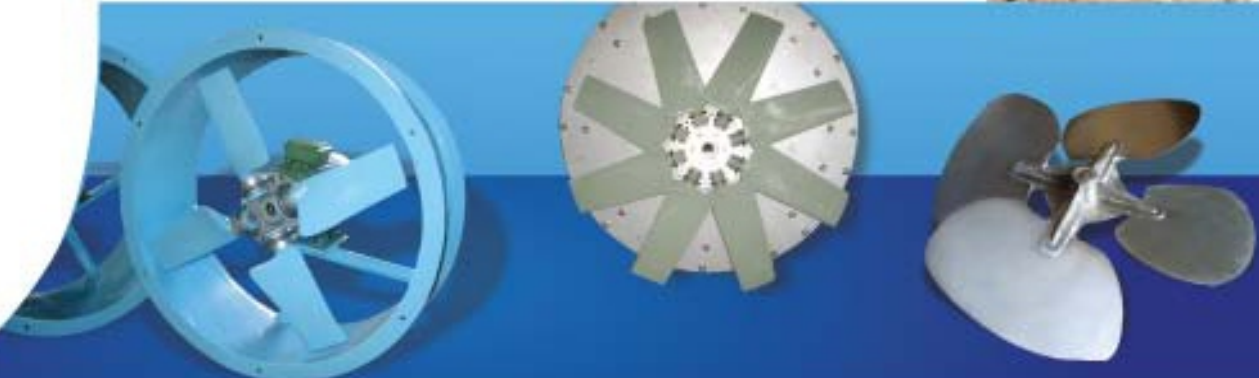
# “Power Saving

The pioneering technology of Aerotech Energy has resulted in 20% ± 5% Power Saving with various diameters of Fans in various applications thus helping in recovering cost of fan in lesser than one year. ”



## Sector Wise Presence

- |            |                |
|------------|----------------|
| Aluminum   | Packing        |
| Cement     | Petrochemical  |
| Chemical   | Pharmaceutical |
| Mining     | Power          |
| Electrical | Rubber         |
| Fertilizer | Steel          |
| Food       | Sugar          |
| OEM        | Textile        |
| Oil        | Tobacco        |
| Paper      | Defense        |
| Automobile | Hotel          |
| Gas        | Airport        |
| Paper      |                |



## SCOPE OF JOB

- a) Designing, Manufacturing, Supply, erecting and Commissioning of Cooling Tower in RCC, Treated Timber, Pultruded FRP and Molded FRP for entire range industrial application
- b) Re-design existing Cooling Tower for enhancement of Cooling Performance and Reduction of Operating Power Consumption with a view of Low maintenance Cooling Towers
- c) Under Performing Cooling Towers are inspected and identify the problems and we provide appropriate solution by Re-Designing the Tower to enhance the required performance of the Cooling Towers.



## CREDIBILITY

The Company is Established about 2 Decades back and have Presence all over India, East Asian Countries, Gulf and Africa. Having started with the Manufacturing of Energy Efficient FRP Hollow Blade Fan Assembly and a Complete Cooling Tower Company.

We offer Service of Cooling Tower Design Consultancy all engineering Services, Manufacturing, Supply, Erection, Commissioning After Sales & Service, repair & Maintenance of all type of Cooling Tower in all Industry.

We also undertake time bound Shutdown jobs on emergency Basis. Since people behind the company have vast experience in Various Industry from concept to commissioning & maintenance & emergency shutdown job. We have Reputed Indian Industries like NTPC, Reliance, JSW, Jindal Steel, Essar Group, IOCL etc in our client list.

Availability of well Trained man Power and in-house manufacturing facility ensure excellent quality products and competitive price in the market



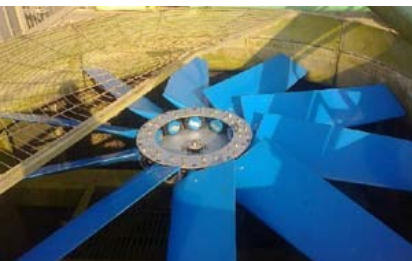




## COOLING TOWER TERMINOLOGY

A Tower cools 1,000 GPM from 95 °F to 85 °F at 72 °F wet bulb temperature and operates at 3 cycles of concentration. Calculate Range, Approach, Heat Rejection, Drift Loss, Evaporation Rate, Bleed Rate and Make-up water requirements.

1. Range:  $(HWT - CWT) = 95 - 85 = 10 \text{ }^{\circ}\text{F}$
2. Approach:  $(CWT - WBT) = 85 - 72 = 13 \text{ }^{\circ}\text{F}$
3. Heat Rejection:  $(Flow_{\text{GPM}} \times Range_{\text{of}} \times 500) = 1,000 \times 10 \times 500 = 5,000,000 \text{ btu's/hr} = 5,000 \text{ MBH}$
4. Typical Drift Loss:  $(0.002\% \times Flow \text{ Rate}) = 0.00002 \times 1,000$
5. Evaporation loss  $(\text{m}^3/\text{hr}) = 0.00085 \times 1.8 \times \text{circulation rate } (\text{m}^3/\text{hr}) \times (T1-T2)$
6. Cooling Tower Efficiency =  $Range / (Range + Approach) \times 100$ .
7. Make-up Water Requirement:  $(Evaporation \text{ Rate}_{\text{GPM}} \times [Cycles/(Cycles-1)]) = 10 \times 3/2 = 15 \text{ GPM}$



**Air Horsepower-** The power output developed by a fan in moving a given air rate against a given resistance.

**Air Travel** - Distance which air travels in its passage through the fill.

**Atmospheric** - Refers to the movement of air through a cooling tower purely by natural means, or by the aspirating effect of water flow.

**Blow-out** - Water droplets blown out of the cooling tower by wind, generally at the air inlet openings. Water may also be lost, in the absence of wind, through splashing or misting. Devices such as wind screens, louvers, splash deflectors and water diverters are used to limit these losses.

**Entering Wet-Bulb Temperature-** The wet-bulb temperature of the air actually entering the tower, including any effects of recirculation. In testing, the average of multiple readings taken at the air inlets to establish a true entering wet-bulb temperature

**Flow-Control Valves** Manually controlled valves which are used to balance flow of incoming water to all sections of the tower.

**Liquid-to-Gas Ratio-** A ratio of the total mass flows of water and dry air in a cooling tower. (See Total Air Rate & Total Water Rate)

**Air inlet-** Opening in a cooling tower through which air enters

**Ambient Wet-Bulb Temperature** The wet-bulb temperature of the air encompassing a cooling tower not including any temperature contribution by the tower itself. Generally measured upwind of a tower in a number of locations sufficient to account for all extraneous sources of heat.

**Capacity** - The amount of water (gpm) that a cooling tower will cool through a specified range at a specified approach and wet-bulb temperature.

**Cross-flow** - Air flow direction through the fill is essentially perpendicular to that of the falling water.

**Fill Cube-** (1) Counter-flow: The amount of fill required in a volume one bay long by one bay wide by an air travel high. Unit: cu ft. (2) Cross-flow: The amount of fill required in a volume one bay long by an air travel wide by one story high

**Heat Load** Total heat to be removed from the circulating water by the cooling tower per unit time.

**Net Effective Volume** That portion of the total structural volume within which the circulating water is in intimate contact with the flowing air.

**Air Rate-** Mass flow of dry air per square foot of cross-sectional area in the tower's heat transfer region

**Bay** - The area between adjacent transverse and longitudinal framing bents.

**BTU (British Thermal Unit)** The amount of heat gain (or loss) required to raise (or lower) the temperature of one pound of water one degree

**Counter-flow** - Air flow direction through the fill is countercurrent to that of the falling water.

**Double-Flow** - A cross flow cooling tower where two opposed fill banks are served by a common air plenum.

**Evaluation** - A determination of the total cost of owning a cooling tower for a specific period of time. Includes first cost of tower and attendant devices, cost of operation, cost of maintenance and/or repair, cost of land use, cost of financing, etc., all normalized to a specific point in time.

**Interference** - The thermal contamination of a tower's inlet air by an external heat source. (i.e. the discharge plume of another cooling tower.)

**Water Loading-** Circulating water rate per horizontal square foot of fill plan area of the cooling tower.

**Approach** - Difference between the cold water temperature and either the ambient or entering wet-bulb temperature. (CW-EWB=A)

**Bleed-Off or Blowdown** - Water discharged from the system to control concentrations of salts or other impurities in the circulating water. Units: % of circulating water rate or gpm.

**Drift Eliminators** - An assembly of baffles or labyrinth passages through which the air passes prior to its exit from the tower, for the purpose of removing entrained water droplets from the exhaust air.

**Fill Deck** - One of a succession of horizontal layers of splash bars utilized in a splash-filled cooling tower. The number of fill decks constituting overall fill height, as well as the number of splash bars incorporated within each fill deck, both establish the effective primary heat transfer surface.

**Leaching** - The loss of wood preservative chemicals by the washing action of the water flowing through a wood cooling tower structure.

**Wind Load-** The load imposed upon a structure by a wind blowing against its surface.

# Our Presence Worldwide



- USA
- Nigeria
- Zambia
- Saudi Arabia
- Spain
- Pakistan
- Italy
- Kenya
- UAE
- Bangladesh
- Thailand
- Australia
- Malaysia
- Singapore
- Philippines

## Our Clientele



[www.aerotech.com](http://www.aerotech.com)

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