

Benefits of Conversion...

Conversion of timber cooling tower to Pultruded FRP cooling tower is a wise step in many ways. First of all there are some natural shortcomings in timber cooling tower which can be listed as follows:

1. Quality of timber available is very low particularly after the ban by honorable Supreme court of India
2. Structure of timber cooling tower has more joints hence more prone to vibrations and failures
3. Failure in timber cooling tower has been seen many times. Collapsing structure poses danger life, property and lost production
4. Cutting of trees for timber is environmentally incorrect particularly in these days of concern on global warming.
5. Timber is prone to decay by chemicals used for water treatment as well as by bio attack by fungi, algae, bacteria etc.
6. Treated wood releases chemicals and contaminates environment. Treatment process itself is hazardous because of use of arsenic and heavy metal based compounds.

Timber cooling towers were generally cross flow type. Cross flow cooling towers are less efficient thermally than counter flow cooling towers. With availability of better fills counter flow design is proved to be more efficient, easy to erect, maintain and run.

Conversion process requires timber cooling tower cells to be dismantled one by one so that there is very little impact on production. Existing basin is used and recovered mechanical equipments can also be used if found in proper working condition.

Pultruded FRP becomes a viable material of construction when conversion is required. For Pultruded FRP there is no need to alter the concrete basin but this may be required in case of conversion by concrete.

GTPL suggests Pultruded FRP as construction material in place of timber or RCC. FRP is technologically advanced and better material with life time of around 15 years.

Pultruded FRP Cooling Tower Structure:

Pultruded FRP based cooling towers have structures having proven Braced Frame Design. These structures are connected to the ground with steel angles and base plates anchored and grouted to the basin. Hardware used at all the places are stainless steel. No piers and pilasters are used in the structure. Frame, Casing, Fan deck, Fan cylinder, staircase, railing, light poles, ladders etc are all of FRP. Where ever necessary anti skid surfacing is used for safety of Operation and Maintenance personnels. The cell size that can be been designed is 18x18 meters and capable to handle fan motor power up to 250 HP/cell.

Advantages of Pultruded FRP in Cooling tower

Pultruded FRP sections as material of construction offer many advantages. Pultrusion combines words “pull” and “extrusion” where extrusion is pulling of material such as fiberglass and resin, through a shaping die. Many resin types can be used in pultrusion including polyester, polyurethane and vinyl ester epoxy resins etc. Fiber is wetted or impregnated with resin and is organized and then removed of excess resin. After that the composite is passed through a heated steel die.

The profile that exits the die is now a cured pultruded Fiber Reinforced Polymer (FRP) composite. This FRP profile is pinched and pulled by a “gripper” system. At the end of the pultrusion machine there is a cut-off saw. Pultruded profiles are cut to the specific length and stacked for delivery.

Some of the advantages of use of Pultruded FRP in constructing Cooling tower are:

1. Strong and light
2. Easy transportation
3. Easy erection
4. Easy handling hence lesser handling equipment required
5. Accident less site because of lesser weight
6. Decay less
7. Painting not required for surface protection and corrosion
8. Can handle acidic and sea water
9. Does not decay due to fungi, hence more durable
10. Accident less as failure less likely
11. High temperature range for pipes of FRP
12. Not prone to alternate wet and dry condition as in timber cooling tower
13. Flame retardant-can be used in refinery, petrochemical, power plant and other hazardous areas
14. Long life span hence customer satisfaction