

Timber Cooling Tower Vs. Pultruded FRP Cooling Tower

Pultruded FRP cooling tower offers many advantages over timber cooling tower. A small comparison between the two is enough to highlight the difference between the two.

Criteria	Timber Cooling Tower	FRP Pultruded Cooling Tower
Quality	Commercial Timber presently available is generally imported and is of species of low grade timber. It is from trees that are less than 10 years old. The grain size has not fully matured as a result of which the structural strength is weak.	FRP is composite material having remarkable strength and other properties
Cost of installation and running	Though initial cost a little bit low, maintenance is very expensive and frequent. Water treatment for wood required. These factors make it expensive in long run. Downtime for maintenance is more	Though slightly expensive, maintenance is very less and thus recovers the extra cost. Downtime less
Operation and maintenance	More operation and maintenance requirement for good running	Less operation and maintenance required
Lengths of Members	Maximum length of single structural member presently available is up to 10 ft. Consequently, numbers of joints are more. This leads to weakening of the structure and vibration over a period of time.	FRP sections are made by pultrusion machines. Therefore required long sections are available.
Decay due to Algae/Fungi	Wood contains cellulose and edible organic materials hence susceptible for growth of Algae/Fungi which causes decay in wood. It is difficult to control these fungi even with the best of the preservative treatments once they are established within the wood.	FRP made of fiberglass and resins being neutral material, is not susceptible for growth of Algae/Fungi. Algae cannot attach easily with the surface, hence less slime.
Decay due to Water quality	Chlorine used to reduce the slime (Algae/Fungi) problem is responsible for corrosion and attacks lignin (natural wood adhesive) at ambient temperature thereby reducing the service life of cooling towers. Acid used to control pH in water causes decay of wood else alkaline media decays lignin. Other corrosive media cause more decay and there is no option for resistance.	There is no impact of acid/chlorine on FRP structure. Special FRP materials can be used for corrosion resistance as per chemicals in the water.

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Criteria	Timber Cooling Tower	FRP Pultruded Cooling Tower
Alternate dry and wet condition	Alternate dry and wet condition and sunlight is ideal for slime (algae/fungi) development. Such alternate wet and dry condition cause tension in wood member. Hence full shut down is not possible. Water has to flow even in standby cell to avoid drying of members. Plenum or other areas suffer due to this	Not applicable for FRP as it is non hygroscopic.
Installation	Installation is prone to defects as it depends on quality of timber fabrication. It is time consuming and usually requires more skilled technicians. Project management becomes difficult	As FRP is easy to design, fabricate and installation is easy and requires less time. Project management used effectively
Repair and Replacement	Repair and replacement cost is very high due to decay of structural members.	Replacement is not required as there is no such decay.
Material Availability	Good quality wood used for timber cooling tower is not readily available in India and has to be imported. Inferior quality timber imported. Generally no certification of quality available.	FRP is easily available. Certification of quality available. Quality can be easily checked.
Life and disposal	5 years (with present wood quality), treated wood is environmentally unsafe	20 Years, recycling processes available.
Environmental Impact	Vast cutting of wood is causing environmental disaster. Getting environmental clearance not easy	No adverse impact on environment.