



MTT

COOLING TOWERS

NEW!

**CTI-ECC
CERTIFIED**



CLOSED MOULDED TECHNOLOGY
INDUCED DRAFT, COUNTERFLOW COOLING TOWERS
(241 TO 5315 kW)

PROVEN TECHNOLOGY FOR DEMANDING ENVIRONMENTS!

CERTIFIED EN ISO 9001





Since its founding in 1976, EVAPCO, Incorporated has become an industry leader in the engineering and manufacturing of quality heat transfer products around the world. EVAPCO's mission is to provide first class service and quality products for the following markets:

- Commercial HVAC
- District Energy
- Industrial Process
- Industrial Refrigeration
- Power

EVAPCO's powerful combination of financial strength and technical expertise has established the company as a recognised manufacturer of market-leading products on a worldwide basis. EVAPCO is also recognised for the superior technology of their environmentally friendly product innovations in sound reduction and water management.



EVAPCO is an employee owned company with a strong emphasis on research & development and modern manufacturing plants. EVAPCO has earned a reputation for technological innovation and superior product quality by featuring products that are designed to offer these operating advantages:

- Higher System Efficiency
- Environmentally Friendly
- Lower Annual Operating Costs
- Reliable, Simple Operation and Maintenance

With an ongoing commitment to Research & Development programs, EVAPCO provides the most advanced products in the industry—**Technology for the Future, Available Today!**

With 19 facilities in nine countries and over 175 sales offices in 51 countries world-wide, EVAPCO is ready to assist in all your equipment needs.

MTT

EVAPCO, Inc. continues its dedication to making advancements in cooling tower technology. The **MTT** cooling tower is an industry first offering total corrosion resistance with precision moulded LRTM panels. The **MTT** combines Evapco's signature features of easy maintenance, efficient operation and low sound with total corrosion resistance. These features make the **MTT** the best cooling tower choice in the industry for projects that demand the highest level of corrosion resistance coupled with proven reliability.

ULTIMATE Corrosion Protection

- Heavy duty, closed moulded composite fibreglass basin casing panels, and fan cylinders.
 - Non-corrosive PVC water distribution, drift eliminators and air inlet louvers.
 - Type 304L and 316L stainless steel wetted components.
 - Heavy duty hot dip galvanised steel mechanical equipment supports and dry components.
- (Optional Type 304L and 316L Stainless Steel available)

Fan Motors and Drive Assembly

- High efficiency motors for all drive configurations.
- Full access to motor from outside.
- Assures long life.

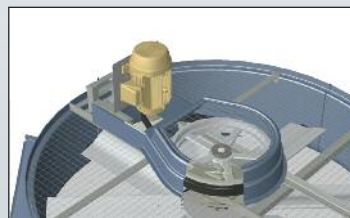
Super Low Sound Fan (Optional)

- 9 to 15dB(A) reduction.
- CTI Certified.

(Available on 8', 10' and 12' wide models)

EVAPCO Power-Band Drive System

- The MTT Cooling Tower features the highly successful, easy maintenance, heavy duty Power-Band Drive System.
- Standard heavy-duty flange mount bearings with a minimum L-10 life of 75,000 hours.
- Extended lube lines.
- External motor/belt adjustment.
- Solid-Back Multi-Groove Power-Band Belts and Totally Enclosed motors are standard.



WST Air Inlet Louvers (Water and Sight Tight)

- Easily removable for access.
- Light-weight, non-corrosive PVC louver frames.
- Improved design to keep sunlight out—preventing biological growth.
- Keeps water in while keeping dirt and debris out.

U.S. Patent No. 7,927,196



**Available in 7 cross sections and a capacity range of 241 to 5315 kW!
The MTT has a model for every application.**

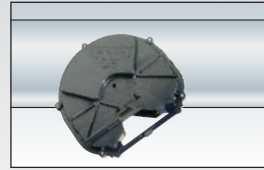
For non-standard conditions and applications, consult your local EVAPCO Representative or the factory for assistance.

CTI-ECC Certified
Refer to pages 12-14
for details

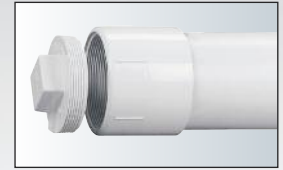


Precision Moulded LRTM Panels

- Panels engineered for strength and structural stability with minimal internal steel framework.
- Smooth internal and external surfaces to prevent dirt and biological build up.



EvapJet™ Nozzle



Water Distribution System

- Non-corrosive PVC construction with EvapJet™ nozzles.
- Large orifice nozzles prevent clogging.
- Each nozzle produces large uniform spray pattern for a reduction of nozzles resulting in 66% fewer nozzles.
- System branches have threaded end caps to assist with debris removal.

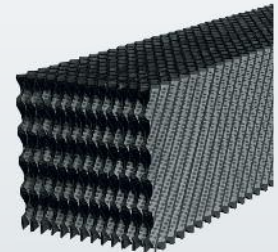
Water Saver Drift Eliminators

- New patented design reduces drift rate to < 0.001%
- Saves water and reduces water treatment cost
- Greater structural integrity vs. old style blade-type
- Recessed into casing for greater protection
- Drift rate certifications with Eurovent OM-14-2009



EVAPAK® Fill

- Induces highly turbulent mixing of the air and water for superior heat transfer.
- Special drainage tips allow high water loading without excessive pressure drop.
- Flame spread rating of 5 per ASTM E84-81a.

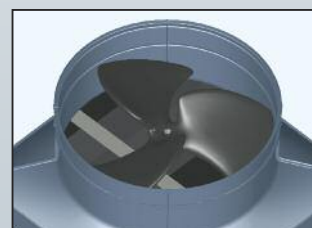


Easy Clean Sloped Basin

- Designed to completely drain the cold water basin.
- Helps prevent build-up of sediment and biological film.
- Eliminates standing water after drain down.
- Reduced water volume.

Optional Low Sound Solutions

- Super Low Sound Fans
- Low Sound Fans
- Water Silencers



Super Low Sound Fan



Water Silencers

Quick Connect Piping System

- Flanged inlet and outlet connections.
- Easy pipe connection at site for quick installation.



† Mark owned by the Cooling Technology Institute

MTT

DESIGN FEATURES

The MTT Design

EVAPCO focuses on continuous improvement and is committed to developing the most innovative products in the industry. In keeping with this commitment, EVAPCO's MTT is the first cooling tower in the industry to feature composite fibreglass panels formed entirely by an advanced, environmentally friendly, LRTM closed mould manufacturing process.

The MTT is the result of a collaborative effort and the combined resources of EVAPCO's global entities. The concept and design basis of the MTT stems from EVAPCO Australia's proven MSS product line, having 20 years of installed history.

Beginning with the MSS concept, Evapco Inc. then further developed the MTT in SolidEdge, a 3D CAD program, then performed standardisation, strength analysis and generated CTI Certified thermal performance at EVAPCO's premier Research and Development Headquarters in Maryland, USA.

EVAPCO Composites Sdn Bhd, in Malaysia then brought the design to life taking responsibility for mould design, pattern making, tooling and finally all FRP parts production utilising LRTM manufacturing process.

The MTT is unique in the industry having SolidEdge designed patterns, moulds machined by 5-axis CNC, and with parts manufactured using LRTM. All aspects of the MTT, from concept to design to manufacture are performed "in-house" and by EVAPCO.

The final assembly of fabricated and globally sourced components is completed at one of EVAPCO's facilities. Country of origin for the final assembled product is available from Australia, Italy or South Africa.

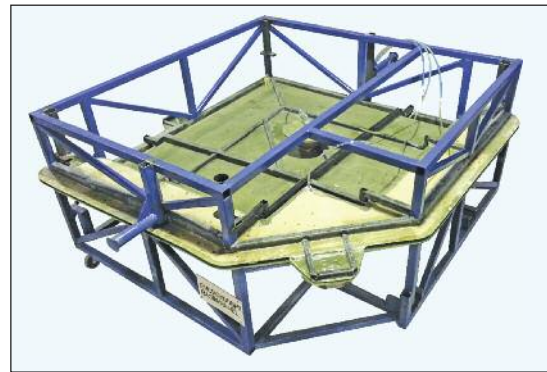
Light RTM Closed Moulding

The LRTM process is an advanced moulding technique utilising a "male" and a "female" mould to create a part. By using two mould surfaces, the resulting parts are high quality with perfectly smooth finishes on both sides.

In the first step of the parts production, a thin layer of gel coat is applied to one or both mould surfaces. Evapco utilises high quality ISO Polyester, UV inhibited, color-match gel coat for superior finish, scratch resistance and UV protection. Next, a reinforcement glass fabric is placed into the female mold cavity. The male mould is aligned over and then lowered to form-fit the female mould. A full vacuum is

then applied to the perimeter locking channel which locks the mould set together.

A separate low vacuum is then applied to the part area of the mould cavity. A predetermined volume of resin is then injected in controlled manner by a resin pump; the flow of the resin is aided by the partial vacuum. The resin infuses uniformly through the reinforcement glass fabric towards the center of the part where the resin outlet and catch pot are located. The catch pot allows any excess of resin to be collected and prevents resin from entering the vacuum system. The infusion is deemed complete when the resin has fully and visibly displaced all air from the mould cavity.

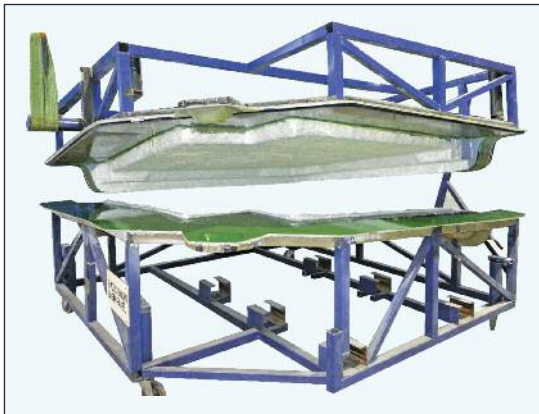


Closed Mould Manufacturing

Once the resin has fully infused, the resin pump is paused and resin flow to the mould is halted. Shortly thereafter the resin proceeds to cure via exothermic reaction; the part is left in the mould for up to 2 hours while it cools and hardens.

Once the part has sufficiently cured, the vacuum is released and the top mould is removed. The part is removed from the mould and then sent for CNC trimming and drilling process. Finally the part is wiped down and prepared for shipment.

While seemingly simple in theory, LRTM requires a commitment of resources and an initial capital investment that is beyond the comfort level of most cooling tower companies. When successfully implemented, the LRTM process provides many benefits including superior quality, 300-400% increased productivity compared to open mould and less VOC emissions leading to a cleaner and more comfortable working environment.



Reinforcement glass fabric loaded into mould cavity



Completed part; removed from mould

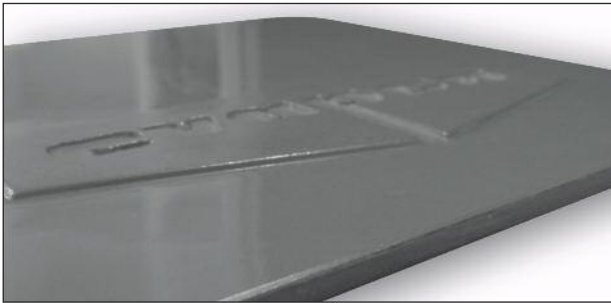
DESIGN FEATURES

Advantages of LRTM

LRTM is widely used in the advanced industries of aerospace, automotive and marine because it produces precision parts, with higher quality and improved surface finish in less time, and with less styrene emissions.

Solid Laminate Construction

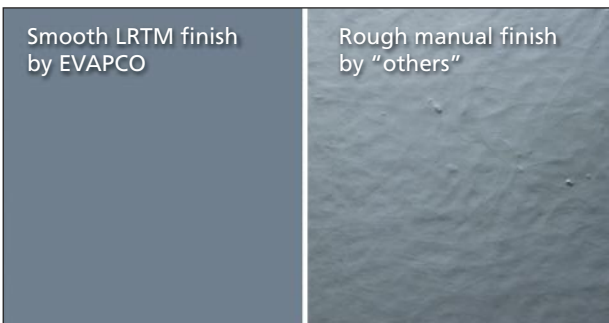
All panels of the MTT cooling tower are structural by design, thus reducing the need for a matrix of internal stainless steel bracing and framework. Designed and constructed for superior strength, the MTT panels are formed using LRTM, having consistent physical and mechanical properties.



LRTM panel having uniform part thickness

Tolerance and Parts Repeatability

Consistent high quality parts are the desirable advantage of the LRTM process. With LRTM, part thickness is uniform which ensures part strength and dimensional accuracy. Being able to produce consistent, quality parts is imperative to the final overall quality of the MTT. With quality and precision in the design and manufacture, the MTT has an unprecedented high degree of "fit-n-finish."



Two Sides Perfectly Smooth

LRTM produces aesthetically and physically superior panels having smooth and shiny finish on both sides. The picture shows the superior finish of LRTM as compared to the rough surface otherwise produced by conventional labour intensive open mould FRP processes.

Reduced Styrene Emissions

The closed nature of LRTM moulding provides reduced VOC emissions and a more worker-friendly environment than open mould processes. Simply put, closed mold manufacturing results in a cleaner, safer, and more productive production plant.

Complex Shapes

LRTM provides superior design flexibility for the creation of complex shapes, forms and compound curves. The fibreglass parts used on the MTT have been designed with this curvature complexity providing inherent part strength.



Compound curvature provides innate part strength

Laboratory Tested for Strength and Consistency

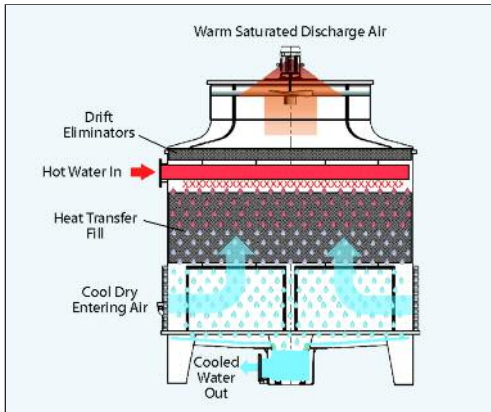
All panel thicknesses have undergone destructive testing for determining the mechanical properties of the LRTM laminates. All tests have been performed in accordance with European (EU) and American (ASTM) Standards, to measure flexural properties, compressive and tensile strengths, modulus and glass content.



The testing results provided a confirmation of theoretical properties of the LRTM manufactured panels.

The Advanced Technology Design

The MTT Cooling Tower product line is an Advanced Technology design which utilises induced draft, counterflow technology – the most efficient in the industry. The counterflow design provides the MTT with inherently better operational and maintenance features. These features are described below:



Principle of Operation

Warm water from the heat source is pumped to the water distribution system at the top of the tower. The water is distributed over the wet deck fill by means of large orifice nozzles. Simultaneously, air is drawn in through the air inlet louvers at the base of the tower and travels upward through the wet deck fill opposite the water flow. A small portion of the water is evaporated which removes the heat from the remaining water. The warm moist air is drawn to the top of the cooling tower by the fan and discharged to the atmosphere. The cooled water drains to the basin at the bottom of the tower and is returned to the heat source.

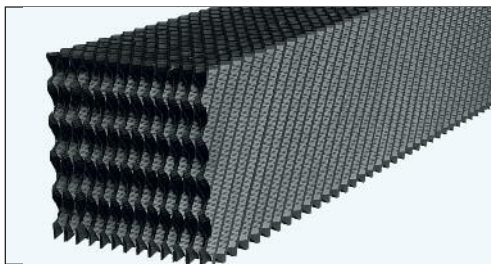
High Efficiency Drift Eliminators

An extremely efficient drift eliminator system is standard on MTT Cooling Towers. The system removes entrained water droplets from the air stream to limit the drift rate to less than 0.001% of the recirculating water rate in accordance with CTI ATC-140. The drift eliminators are constructed of inert polyvinyl chloride (PVC), effectively eliminating corrosion of these vital components.



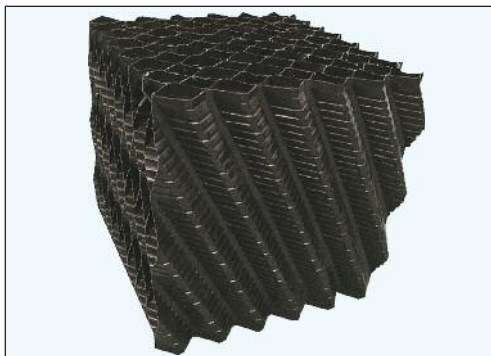
EVAPAK® Fill

EVAPCO's PVC fill design used in the MTT Cooling Tower range is designed to induce highly turbulent mixing of the air and water for superior heat transfer. Special drainage tips allow high water loadings without excessive pressure drop. The fill is constructed of inert polyvinyl chloride, (PVC), will not rot or decay, and is formulated to withstand water temperatures of up to 55°C. The fill is also constructed in easy to handle and removable block form. For design conditions with dirty water or higher temperatures, special fill types are available. Consult your EVAPCO representative for further details.



High Temperature Solutions

EVAPCO's standard fill and drift eliminators can withstand temperatures up to 55°C. For higher temperature applications, EVAPCO can provide HPVC which is rated for temperatures up to 66°C. For high temperature applications, the standard PVC water distribution system is upgraded to CPVC.



Wide-Pak Fill

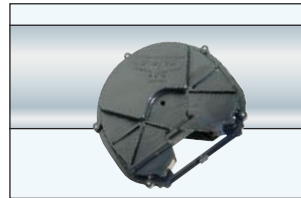
Evapco's Wide-Pak fill is CTI certified and is suitable for dirty water applications. The Wide-Pak fill maximises efficiency while its wide flute design prevents clogging. Contact your local Evapco representative for performance de-rates when performing selections using Wide-Pak Fill.

DESIGN ADVANTAGES



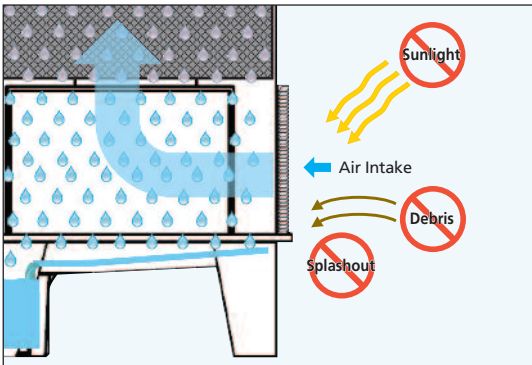
Pressurised Water Distribution System

The water distribution system is constructed of PVC pipe and EvapJet™ ABS plastic water diffusers for corrosion protection in this key area. The piping is easily removable for cleaning. The wide orifice nozzles mounted on the side of the pipe used in the MTT water distribution system help prevent clogging, reducing the maintenance costs of the water distribution system.



EvapJet™ nozzle

The spray pressure for all MTT Cooling Towers is between 7 and 41 kPa at the inlet header. The actual spray pressure will be shown on the submittal which is prepared for each unit.



Reduced Joints

The LRTM allows larger, and more complex shapes to be manufactured compared to other processes such as pultruded FRP. As such, the construction of the MTT generally requires less FRP sections and therefore, joints. This improves joint sealing of FRP panels and minimises the occurrences of leaks.

WST Air Inlet Louvers (Water and Sight Tight)

EVAPCO's WST Inlet Louvers keep water in and sunlight out of induced draft products. The unique non-planar design is made from light-weight framed PVC sections which have no loose hardware, enabling easy unit access. The louver air channels are optimise to maintain fluid dynamic and thermodynamic efficiency and block all line-of-sight paths into the basin eliminating splash-out; even when the fans are off. Additionally, algae growth is minimised by blocking all sunlight. The combination of easy access, no splash-out and minimised algae growth saves the end user money on maintenance hours, water consumption and water treatment costs.

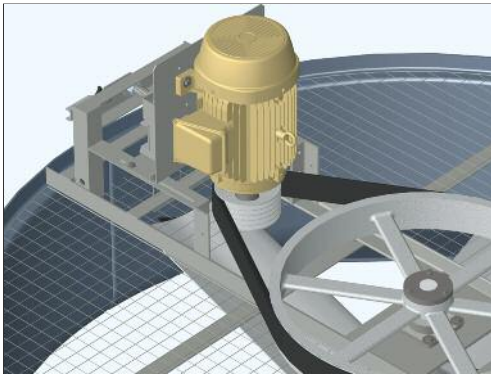


Stainless Steel Strainers

Strainers are subjected to harsh conditions though the life cycle of the tower. The stainless steel strainer is provided by EVAPCO as standard to ensure longevity of the tower pumping system, limiting large dirt or debris from entering.

The Advanced Technology POWER-BAND Drive System Design

The MTT adopts the standard belt drive system utilised in EVAPCO's induced draft counter flow towers. EVAPCO Power-Band Belt Drive system is engineered for heavy-duty cooling tower operation and provides trouble-free operation in the most severe of cooling tower applications. The Power-Band drive system is applicable to 8' wide box sizes and larger.



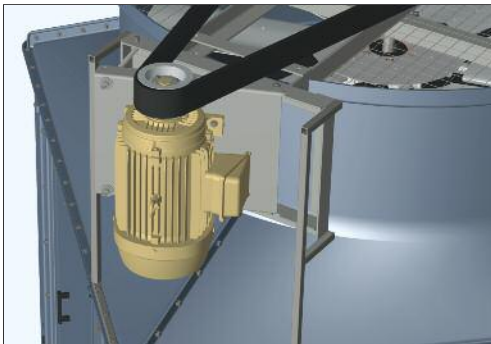
Drive configuration for 12' wide units and larger.

The fan motor and drive assembly are mounted externally to the unit in a belt drive configuration. Belt tension is checked and adjusted by tightening the J-bolts on the motor base or moving the motor along the all thread. The lubrication lines are extended to the motor base, making bearing lubrication easy. All motors and lubrication lines are safely accessible with the (optional) ladder-platform and perimeter handrails accessory.

The 8' and 10' units utilise under slung and shaft up TEFC motors, outside the discharge air stream. Units that are larger than 10' utilise TEAO motors which are installed atop of the tower and in the discharge air stream.

Fan Motors

All MTT Cooling Tower models utilize heavy duty totally enclosed fan motors designed specifically for cooling tower applications suitable for VFD applications. In addition to the standard motors offered on each cooling tower, EVAPCO offers many optional motors to meet your specific needs, including Multi-Speed Motors.



Drive configuration for 8' and 10' wide units and larger.

Power-Band Belt Drive

The Power-Band drive is a solid-back multi-groove belt system that has high lateral rigidity. The belt is designed for cooling tower service, and is constructed of neoprene with polyester cords. The drive belt is sized for 150 percent of the motor nameplate horsepower ensuring long and trouble free operation.

Drive System Pulleys

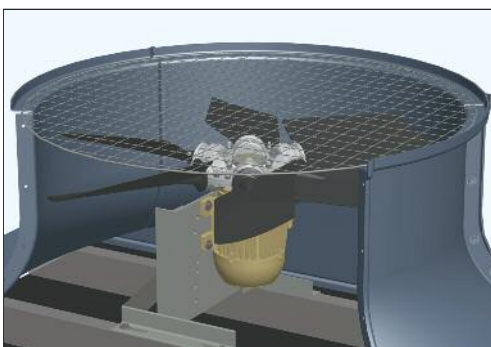
Drive system pulleys located in the warm, moist atmosphere inside the cooling tower are constructed of an aluminium alloy.

Fan Shaft Bearings

The fan shaft bearings on the MTT cooling tower are specially selected to provide long life, minimising costly downtime. They are rated for a minimum L-10 life of 75,000 hours, making them the heaviest duty flange mount bearing in the industry used for cooling tower duty.

4' Wide Models Only

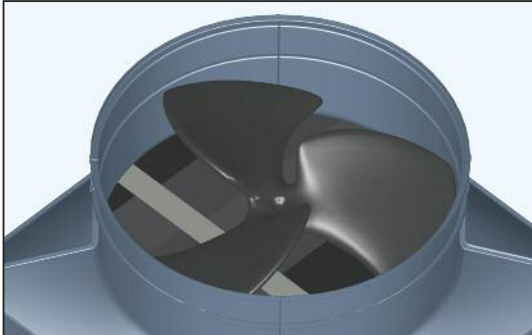
The fan motor is mounted internally, in a direct drive configuration. Access to the drive system for maintenance is via the access panel and ladder and platforms are not required. The TEAO fan motor is epoxy coated as standard.



Drive configuration for 4' wide units.

DESIGN ADVANTAGES

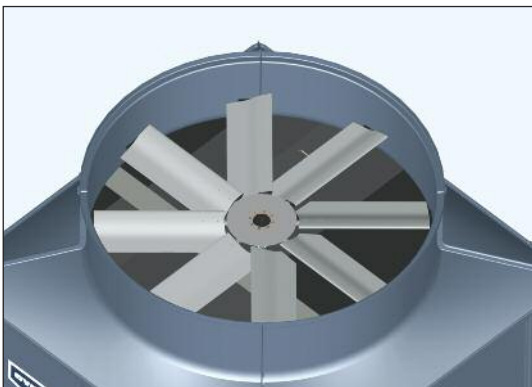
The Expanded Family of the EVAPCO Super Low Sound Fans



Super Low Sound Fan 9 – 15 dB(A) Reduction!

The Super Low Sound Fan offered by EVAPCO utilises an extremely wide chord blade design available for sound sensitive applications where the lowest sound levels are desired. The fan is two-piece molded heavy duty FRP construction utilising a forward swept blade design. The Super Low Sound fan is capable of reducing the unit sound pressure levels **9 dB(A) to 15 dB(A)**, depending on specific unit selection and measurement location compared to the original MTT fan. The Super Low Sound Fan will have no impact on unit thermal performance and is **CTI Certified**. See Table 1 for low sound height and operating weight additions.

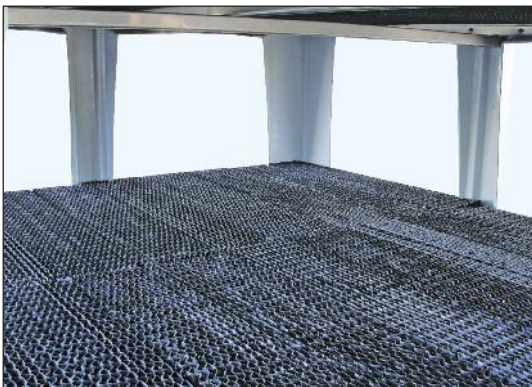
Note: Available on 8', 10' and 12' wide models only.



Low Sound Fan* 4 – 7 dB(A) Reduction!

The Low Sound Fan offered by EVAPCO is a wide chord blade design for sound sensitive application where low sound levels are desired. The Low Sound Fan shall utilise a unique soft-connect blade-to-hub design that is compatible with Variable Speed Drives. Since the blades are not rigidly connected to the fan hub, no vertical vibration forces are transmitted to the unit structure which reduces sound pressure levels **4 dB(A) to 7 dB(A)**, depending on specific unit selection and measurement location. The fans are high efficiency axial propeller type and are CTI Certified on the MTT line of cooling Towers.

* The CTI Certified Low Sound Fan will have a thermal performance de-rate up to 3.5%. Consult the factory or evapSelect® program for actual thermal performance.



Water Silencer – Reduces Water Noise in the Cold Water Basin up to 7 dB(A)!

EVAPCO's water silencers are located in the cold water basin. The water silencers reduces the high frequency noise associated with the falling water and is capable of reducing overall sound levels **4dB(A) to 7dB(A)** measured at 1.5 m from the side or end of the unit. The water silencers reduce overall sound level **9dB(A) to 12 dB(A)** (depending on water loading and louver height) measured 1.5 m from the side or end of the unit when water is circulated with fans off.

The Water Silencers are constructed of lightweight PVC sections and can be easily removed for access to the basin area. This option has no impact on unit thermal performance.

Note: Water Silencers are not available on 4' wide models and models with "No Basin".

Table 1: Super Low Sound Fan height and weight additions.

Box Size	SUPER LOW SOUND	
	Height Add (mm)	Additional Weight (kg)
8 x 8	260	90
10 x 10	330	30
12 x 12	330	30

Standard and Optional Maintenance Features

Routine maintenance is the key to a long lasting cooling tower. EVAPCO has cooling tower maintenance features and accessories to complement the robust design of the MTT. The two main areas that requires easy access for routine maintenance is the motor and drive assemblies as well as the cold water basin.



Drive Ladder and Platform Access

These two accessories are available on 8' wide units and larger. The ladder platform provides access to the motor and lubrication lines for motor checks and maintenance. Where required, EVAPCO is able to provide safety cages for the ladder.



Access Door

EVAPCO's MTT incorporates one man-sized access door for maintenance as standard. The access panel is designed such that the fill blocks and drift eliminators can be easily removed and replaced for cooling tower cleaning. Additional access panels may be added subject to approval from the factory, contact your local sales representative for more information.



Sump Sweeper Piping

Set up around the perimeter of the basin, the MTT's sump sweeper piping washes the debris toward the sump outlet. This option is also available with high flow educator nozzles to facilitate in pan cleaning. The system contains one inlet and one outlet connection. Filters, mechanical separators, external piping or controls are not included. Contact your local sale representative for flow rate recommendations.



Easy Basin Access

The cold water basin section is easily accessible from ground level by (2) two nuts and bolts on the inlet louver assembly surrounding the cooling tower and lifting out the light weight louver. The basin can be accessed from all (4) four sides of the cooling tower.

APPLICATION

Design

EVAPCO Cooling Towers are designed to be corrosion resistant for long and trouble-free operation. Proper equipment selection, installation and maintenance are necessary to ensure full unit performance while maximising the equipment's service life. Some major considerations in the application of a tower are below. For additional information, please contact the factory.

Piping

Cooling tower piping should always be designed and installed in accordance with good engineering practices and territory regulations. All piping should be anchored by properly designed hangers and supports with allowance made for possible expansion and contraction. No external loads should be placed upon cooling tower connections, nor should any of the piping supports be anchored to the unit framework.

The piping connection locations shown on the drawings included in this catalogue and on the website are standard locations that may be changed. If the piping connection locations shown do not meet the needs of a particular project, contact the factory to determine a viable solution.

Air Circulation

In reviewing the system design and unit location, it is important that adequate fresh air is provided to enable proper unit performance. The ideal location is on an unobstructed rooftop or at ground level, away from walls and other barriers. Care must be taken when locating towers in wells or enclosures or next to high walls as the potential for recirculation increases. Recirculation increases the wet bulb temperature of the entering air, causing the leaving water temperature to rise above the design conditions. For these cases, the unit should be elevated so it is even with the adjacent wall, reducing the probability of recirculation. For additional information, see the EVAPCO's Equipment Layout Manual. Engineering assistance is also available from the factory to identify potential recirculation problems and recommend solutions.

Water Treatment

Proper water treatment is an essential part of the maintenance required for all evaporative cooling equipment. A well designed and consistently implemented water treatment program will help to ensure efficient system operation while maximising the

equipment's service life. A qualified water treatment company should design a site specific water treatment protocol based on equipment (including all metallurgies in the cooling system), location, make-up water quality and usage.

Without proper water treatment, the equipment can be susceptible to scale build-up on its heat exchange surfaces, biological growth in the recirculating water and corrosion of its components. Your site specific water treatment protocol should include procedures for routine operation, startup after a shut-down period, and system lay-up, if applicable.

Recirculating Water System

The cooling in a tower is accomplished by the evaporation of a portion of the recirculated spray water. As this water evaporates, it leaves behind mineral content and impurities. Therefore, it is important to bleed-off an amount of water proportional to that which is evaporated to prevent the build up of impurities. If this is not done, the mineral content and/or the corrosive nature of the water will continue to increase. This can ultimately result in heavy scaling or a corrosive condition.

Bleed-off

Evaporative cooling equipment requires a bleed or blow-down line to remove concentrated water from the system. The mineral concentration is monitored by measuring the conductivity of the water. EVAPCO recommends an automated conductivity controller to maximise the water efficiency of your system. Based on recommendations from your water treatment supplier, the conductivity controller should open and close a bleed valve to maintain the conductivity of the recirculating water.

Control of Biological Contaminants

Evaporative equipment should be inspected regularly to ensure good microbiological control. Inspections should include both monitoring of microbial populations via culturing techniques and visual inspections for evidence of biofouling. Poor microbiological control can result in loss of heat transfer efficiency, increase corrosion potential, and increase the risk of pathogens such as those that can cause risk to health. If excessive microbiological contamination is detected, a more aggressive mechanical cleaning and/or water treatment program should be undertaken.

Technical Support Services

EVAPCO's evapSelect™ Equipment Selection Program

EvapSelect™ is a Web based computer selection program which allows the design engineer to choose EVAPCO models and optimize unit selections. The program allows the engineer to evaluate the equipment's thermal performance, space, energy requirements and water consumption. Once the model is selected and optional equipment features are inserted, the engineer may output a complete specification AND a unit drawing from this program.

The software is designed to provide the user with maximum flexibility in analyzing the various selection parameters while in a friendly and familiar Windows format.

The EvapSelect™ software is available to all consulting engineering offices and design-build contractors. The programs are distributed through the local EVAPCO sales representative or the EVAPCO offices.

EVAPCO's Website

Log on to EVAPCO's new and improved website <http://www.evapco.eu> for expanded product information. Product literature, Rigging and Maintenance Instructions are all accessible online from your computer.

The EvapSelect™ Equipment Selection Software program may be accessed using Microsoft Internet Explorer after contacting your local EVAPCO sales representative. Users may make Requests for Quotation through the website or by e-mailing EVAPCO at this address:

evapco.europe@evapco.eu

With the EvapSelect™ program, equipment selections, written specifications, unit drawing files and EVAPCO on-line information are readily available from the comfort of your own office!

In its continuing commitment to be the leaders in evaporative cooling equipment design and services, EVAPCO MTT Cooling Towers are now **Independently Certified** by **CTI**, to perform thermally in accordance with the published data.

What is CTI?

Cooling Technology Institute

The Cooling Technology Institute is an organization headquartered in the United States with over 400 member companies from around the globe. CTI membership is composed of manufacturers, suppliers, owner operators, and test agencies from over 40 countries. In 2008 CTI certified more than 5000 Evaporative Heat Transfer Systems (EHTS) from 49 product line of 24 participants.

CTI's Mission and Objectives

This can be best explained by the CTI's published Mission statement and Objectives revised in December 2003 and published on their website www.cti.org.

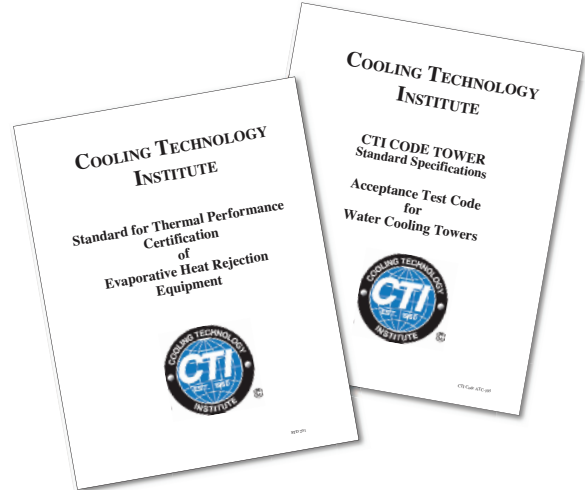
CTI Mission Statement

To advocate and promote the use of environmentally responsible Evaporative Heat Transfer Systems (EHTS) for the benefit of the public by encouraging:

- Education
- Research
- Standards Development and Verification
- Government Relations
- Technical Information Exchange

CTI Objectives

- Maintain and expand a broad base membership of individuals and organizations interested in Evaporative Heat Transfer Systems (EHTS).
- Identify and address emerging and evolving issues concerning EHTS.
- Encourage and support educational programs in various formats to enhance the capabilities and competence of the industry to realize the maximum benefit of EHTS.
- Encourage and support cooperative research to improve EHTS technology and efficiency for the long-term benefit of the environment.
- Assure acceptable minimum quality levels and performance of EHTS and their components by establishing standard specifications, guidelines, and certification programs.
- Establish standard testing and performance analysis systems and procedures for EHTS.
- Communicate with and influence governmental entities regarding the environmentally responsible technologies, benefits, and issues associated with EHTS.
- Encourage and support forums and methods for exchanging technical information on EHTS.



Benefits to the End User

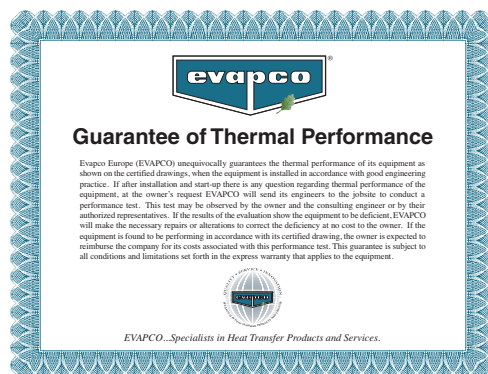
CTI defines an independent testing certification program that is specifiable, enforceable and available to all equipment manufacturer's. End users that purchase CTI certified products are assured that those products will perform thermally as specified.

Additionally CTI certification is the first step for the Green Building Concept in Europe:

- LEED - Leadership in Energy and Environmental Design
- Best Available Practice
- Green Building Rating System

Thermal Performance Guarantee

In addition to the CTI Certification, Evapco unequivocally guarantees the Thermal Performance of ALL Evapco Equipment. Every unit order is confirmed with a submittal package that includes an Evapco Thermal Performance Guarantee Certificate.



CTI CERTIFICATION

CTI Certification Program

CTI Certification Process

- Submit Application for Certification
- CTI completes a technical review of the product line submitted
- CTI performs an initial qualification test in a laboratory on a specified model number
- CTI issues an Approval Letter with Validation Number if test is passed. Letter is also distributed to all members of CTI to inform everyone that a successful certification has been completed. The Certification Validation Number assigned should be fixed to each tower sold and displayed in all catalogs and other literature
- Product Line must undergo an Annual Reverification Test - Different model number is selected every year
- More details can be found on the CTI website www.cti.org

CTI Certification Test Parameters

- Entering Wet Bulb temperature - 12.8°C to 32.2°C
- Cooling Range - Minimum of 2.2°C
- Cooling Approach - Minimum of 2.8°C
- Process Fluid Temperature - Maximum of 51.7°C
- Barometric Pressure - 91.4 to 105 kPa
- More details can be found on the CTI website www.cti.org

CTI Certification Limitations

- Specific manufacturer's product line name and model numbers
- Applicable only to product lines and model numbers submitted
- Multiple cell model numbers are allowed if the airflow is not affected or the configuration impact is included in the unit rating
- Optional accessories are allowed if the airflow is not affected or the accessory impact is accounted for in the rating
- More details can be found on the CTI website www.cti.org

Evapco Europe CTI Certified AT Product Line

AT Line of CTI Certified Cooling Towers

- CTI Certification Validation Number 99-13-01
- Includes CE compliant fan screen
- Includes the use of side, end or bottom water inlet configuration
- Includes optional Super Low Sound Fan (SLSF)
- Includes optional pan Water Silencers (WS)
- Includes optional Low Sound Fan (LSF)
- Includes optional Wide-Pak Fill
- Includes optional external service platform and ladders for access
- **evapSelect™** Technical data sheet will state "CTI-ECC Certified Cooling Tower"
- Unit will receive a CTI and ECC Certified Shield located near the nameplate

Note

All CTI Certified Product Lines of all manufacturers with CTI certified products can be found on the website: <http://www.cti.org/certification.shtml>



† Marks owned by the Cooling Technology Institute

In 2007 Evapco launched the initiative to create the "European Chapter" of CTI. At the start of this initiative, Eurovent and CTI established a "Memorandum of Understanding". Since then the "Operational Manual for Certification of Cooling Towers" and the "Eurovent Rating Standard for Cooling Towers" were written. Both documents are strongly tied to the CTI documents STD 201 and ATC 105. A common "CTI-EUROVENT" Certification program has become the European Standard for independent thermal performance rating of cooling towers.

EUROVENT – CTI cooperation

EUROVENT Association

Initially founded in 1958 EUROVENT Association represents the European refrigeration, air conditioning, air handling, heating and ventilation industry and trade associations from European and non-European countries. Over 1000 companies in 13 European countries, employing 150000 employees who jointly generate more than € 25 to 30 billion of annual output are member of this organization.



EUROVENT mission

EUROVENT represents, promotes and defends the industry to relevant national and international bodies and cooperates with other European umbrella associations. Over the years EUROVENT has become a well-known and respected stakeholder in all industry related matters and, in particular, in climate change and energy efficiency. EUROVENT develops product certification programs for the entire industry through the EUROVENT Certification Company.

EUROVENT Certification

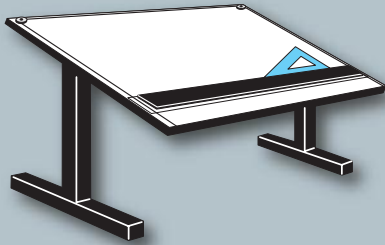
The main objective of the EUROVENT Certification Company (ECC) is to certify cooling equipment (and/or components) independently from EUROVENT Association. With a common set of well-defined procedures and criteria for the rating of products, comparison of product performance ensures a healthy and solid competition on a market open to all manufacturers. When a manufacturer participates in a certification program, he has to present its list of models or model ranges together with their performance data. The files are evaluated by the ECC Certification and a predefined number of units are selected for testing by **independent laboratories**. If the results comply with the relevant standards, the submitted models or ranges will be listed in the **EUROVENT Certification Online Directory**. Models are subject to regular random testing to verify compliance with catalogue data.



Benefits

The Certification Mark guarantees specifying engineers, installers and end users that the products marketed by a participant have been submitted to independent testing and that they have been accurately rated. Through specification of **certified products**, the engineer's tasks become easier, since there is no need to carry out detailed comparison and performance testing.





Thermal Performance



Engineering Data & Dimensions

To make a selection: Locate the column with the desired operating temperature conditions. Read down the column until you find the flow in litres per second equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty.

Thermal performance certified by the Cooling Technology Institute (CTI) and Eurovent Certification Company (ECC) in accordance with CTI Standard 201



ENGINEERING

TOWER CAPABILITY IN LPS AT THE FOLLOWING TEMPERATURE CONDITIONS (°C)

MODEL NUMBER	MOTOR kW	EWT	32	37	32	37	35	40	35	40	37	42
		LWT	27	27	27	27	30	30	30	30	32	32
		WB	20	20	22	22	24	24	25	25	26	26
MTT 14-2F6	2.2		14	9	11	7	15	10	13	9	16	11
MTT 14-2G6	4		17	11	13	9	17	12	16	11	19	13
MTT 14-3F6	2.2		15	11	13	9	16	11	15	10	17	12
MTT 14-3G6	4		18	12	15	10	19	13	17	12	20	14
MTT 14-2E9	1.5		19	12	15	10	20	13	18	12	22	15
MTT 14-2F9	2.2		22	15	18	12	23	16	21	14	25	17
MTT 14-3E9	1.5		21	14	17	12	22	15	20	14	24	17
MTT 14-3F9	2.2		24	17	20	14	25	18	23	16	27	19
MTT 18-2G8	4		29	18	22	14	30	19	27	17	33	21
MTT 18-3G8	4		31	21	25	17	33	22	30	20	36	24
MTT 18-3H8	5.5		34	23	28	19	35	24	32	22	39	27
MTT 18-3I8	7.5		37	25	30	20	38	26	34	24	41	29
MTT 18-3J8	11		41	28	33	23	42	29	39	27	46	32
MTT 110-2G10	4		34	19	25	15	35	21	31	18	39	24
MTT 110-2H10	5.5		40	24	30	18	41	26	37	23	46	29
MTT 110-2I10	7.5		44	27	34	21	46	29	41	26	51	33
MTT 110-3H10	5.5		45	29	36	23	47	31	42	28	51	34
MTT 110-3I10	7.5		49	32	40	26	51	34	46	31	56	38
MTT 110-3J10	11		56	38	46	31	58	40	53	36	64	44
MTT 112-2I12	7.5		62	38	49	29	65	41	58	36	72	46
MTT 112-2J12	11		72	46	57	36	75	49	68	44	83	55
MTT 112-3J12	11		80	53	65	44	83	56	75	51	91	63
MTT 112-3K12	15		88	59	72	49	91	63	83	57	99	69
MTT 112-3L12	18.5		94	64	77	53	97	68	89	62	106	74
MTT 112-4L12	18.5		97	68	80	58	100	71	91	66	109	78
MTT 116-2L16	18.5		136	85	106	67	142	90	127	81	157	102
MTT 116-3M16	22		158	105	128	86	164	111	149	101	179	123
MTT 116-3N16	30		168	112	136	92	174	119	158	108	190	131
MTT 116-4N16	30		174	121	143	103	180	127	164	117	196	139
MTT 116-4O16	37		181	127	150	108	188	133	171	123	204	145
MTT 120-3O20	37		265	175	214	143	276	186	249	169	301	206
MTT 120-4O20	37		276	191	227	162	285	201	260	185	310	220
MTT 120-4P20	45		286	199	236	168	296	209	270	192	322	228
MTT 120-4Q20	55		298	208	246	176	309	219	282	202	336	239

Note: For alternate selections and conditions other than those stated, consult your evapSelect® selection program or local EVAPCO representative.



THERMAL PERFORMANCE DATA

To make a selection: Locate the column with the desired operating temperature conditions. Read down the column until you find the flow in litres per second equal to or greater than the flow required. Read horizontally to the left to find the model number of the unit that will perform the duty.

Thermal performance certified by the Cooling Technology Institute (CTI) and Eurovent Certification Company (ECC) in accordance with CTI Standard 201



TOWER CAPABILITY IN LPS AT THE FOLLOWING TEMPERATURE CONDITIONS (°C)

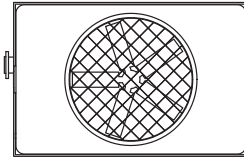
MODEL NUMBER	MOTOR kW	EWT	35	37	45	36	37	38	42	45	37	45
		LWT	30	32	35	31	32	33	32	35	32	35
		WB	27	27	27	28	28	28	28	28	28	29
MTT 14-2F6	2.2		10	15	14	10	13	15	9	14	11	13
MTT 14-2G6	4		11	17	17	12	15	18	10	16	13	15
MTT 14-3F6	2.2		11	16	16	11	14	17	10	15	12	14
MTT 14-3G6	4		13	18	18	13	16	19	12	17	14	16
MTT 14-2E9	1.5		13	20	19	13	17	21	11	18	14	17
MTT 14-2F9	2.2		15	23	23	16	20	24	14	21	17	20
MTT 14-3E9	1.5		15	22	21	15	19	23	13	20	16	19
MTT 14-3F9	2.2		17	25	25	18	22	26	16	23	19	22
MTT 18-2G8	4		18	30	29	20	25	31	17	27	21	25
MTT 18-3G8	4		21	33	32	22	28	34	19	30	24	28
MTT 18-3H8	5.5		23	35	35	25	31	37	21	33	26	31
MTT 18-3I8	7.5		25	38	37	27	33	39	23	35	28	33
MTT 18-3J8	11		29	42	41	30	37	44	27	39	31	37
MTT 110-2G10	4		20	35	34	22	29	37	18	32	23	29
MTT 110-2H10	5.5		25	41	40	26	35	43	22	38	28	35
MTT 110-2I10	7.5		28	46	45	30	39	48	25	42	32	39
MTT 110-3H10	5.5		30	46	45	31	40	49	27	43	33	40
MTT 110-3I10	7.5		33	51	50	35	44	53	30	47	37	44
MTT 110-3J10	11		39	58	57	41	51	61	36	54	43	51
MTT 112-2I12	7.5		40	65	63	42	55	68	35	59	44	55
MTT 112-2J12	11		47	75	73	50	65	79	43	69	53	64
MTT 112-3J12	11		55	83	81	58	72	87	50	77	60	72
MTT 112-3K12	15		61	91	89	64	80	95	56	84	67	79
MTT 112-3L12	18.5		66	97	95	69	85	101	61	90	72	85
MTT 112-4L12	18.5		69	100	98	72	88	104	65	93	75	88
MTT 116-2L16	18.5		87	141	138	93	121	149	79	130	98	120
MTT 116-3M16	22		107	163	160	113	143	171	98	152	119	142
MTT 116-3N16	30		115	173	170	121	152	181	106	161	127	151
MTT 116-4N16	30		124	179	176	129	158	187	115	167	135	158
MTT 116-4O16	37		130	187	184	135	165	195	121	175	141	165
MTT 120-3O20	37		180	274	269	190	239	287	165	255	199	238
MTT 120-4O20	37		196	284	279	204	251	296	182	265	213	250
MTT 120-4P20	45		203	294	289	212	260	307	189	275	221	259
MTT 120-4Q20	55		213	307	302	222	272	321	198	287	232	271

Note: For alternate selections and conditions other than those stated, consult your evapSelect® selection program or local EVAPCO representative.

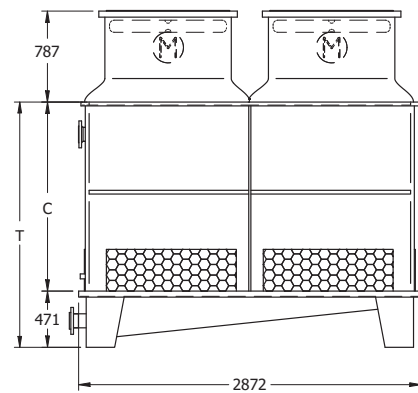
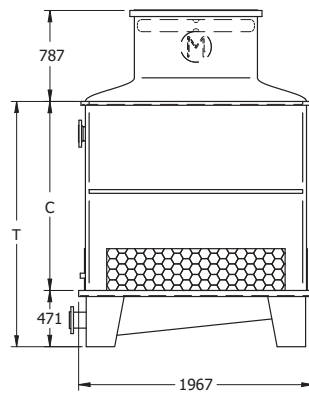
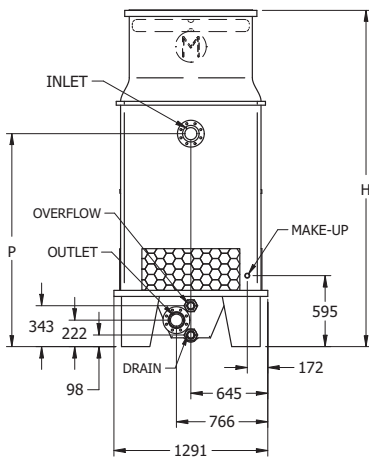
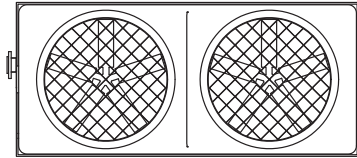
ENGINEERING

**MODELS: MTT 14-2F6 to 14-3G6
MTT 14-2E9 to 14-3F9**

MTT 14-2F6 to 14-3G6



MTT 14-2E9 to 14-3F9



All Inlet and Outlet Connections are: DIN 2576 Flange (Europe) Inlet DN100; Outlet DN100. Make-up MPT DN25; Overflow: FPT DN50; Drain FPT DN50

Model No.	Nominal Capacity (kW)	Weights (Kg)			Fan Motor (kW)	Air Flow (m³/s)	Dimensions (mm)			
		Shipping	Operating	Heaviest Section*			H	T	P	C
MTT 14-2F6	241	505	785	405	2.2	8	2819	2102	1789	1629
MTT 14-3F6	272	545	825	445	2.2	9.3	3124	2407	2094	1934
MTT 14-2G6	287	510	790	410	4	7.8	2819	2102	1789	1629
MTT 14-3G6	318	550	830	450	4	9.2	3124	2407	2094	1934
MTT 14-2E9	320	745	1180	610	(2) 1.5	10.9	2819	2102	1789	1629
MTT 14-3E9	366	805	1245	675	(2) 1.5	12.4	3124	2407	2094	1934
MTT 14-2F9	382	765	1200	635	(2) 2.2	10.8	2819	2102	1789	1629
MTT 14-3F9	428	830	1265	700	(2) 2.2	12.2	3124	2407	2094	1934

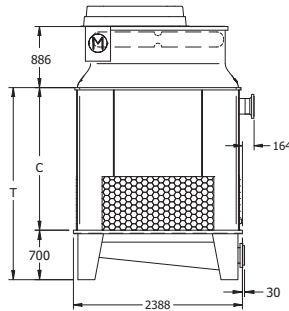
- NOTE: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
 (2) Do not use catalog drawings for certified prints. Dimensions and weights are subject to change.
 (3) Adequate spacing must be allowed for access to the cooling tower. Refer to EVAPCO's Equipment Layout Manual.
 (4) Nominal capacity is based on 0.431 l/s per 10kW of heat rejection at 35°C entering water temperature, 29.5°C leaving water temperature, and 25.5°C wet-bulb temperature (3GPM per ton at 95°F to 85°F, at 78°F wet bulb).

* Ships as one piece. Contact factory for alternate arrangements.

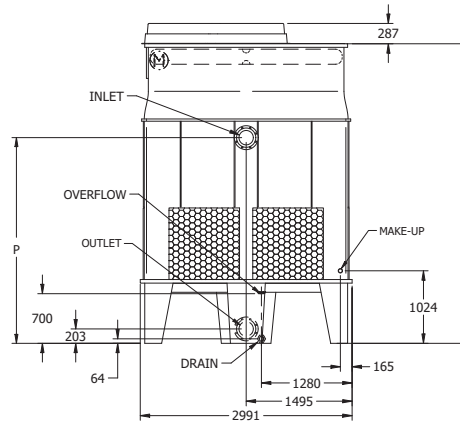
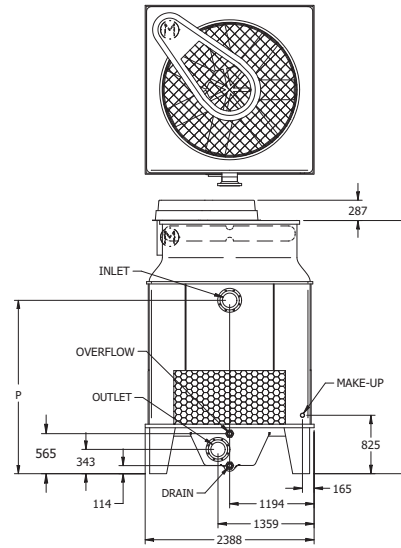
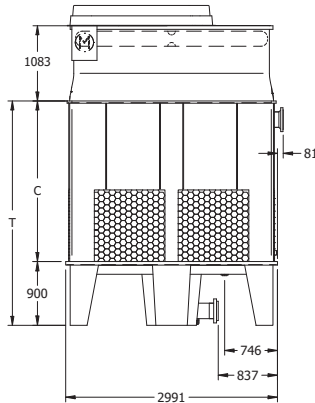
ENGINEERING DATA & DIMENSIONS

MODELS: MTT 18-2G8 to 18-3J8
MODELS: MTT 110-2G10 to 110-3J10

MTT 18-2G8 TO 18-3J8



MTT 110-2G10 TO 110-3J10



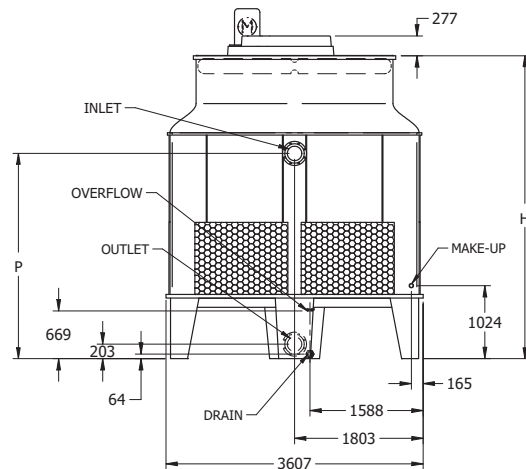
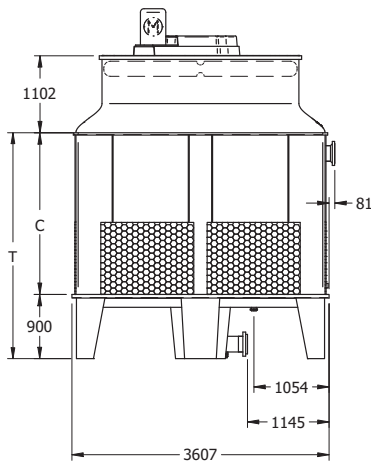
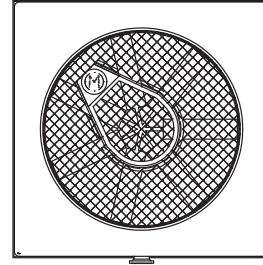
All Inlet and Outlet Connections are: DIN 2576 Flange (Europe) Inlet DN200; Outlet DN200. Make-up MPT DN50; Overflow: FPT DN50; Drain FPT DN50

Model No.	Nominal Capacity (kW)	Weights (Kg)			Fan Motor (kW)	Air Flow (m ³ /s)	Dimensions (mm)				Shipping Arrangement
		Shipping	Operating	Heaviest Section*			H	T	P	C	
MTT 18-2G8	472	1430	2210	605	4	15.1	3578	2759	2427	2057	A
MTT 18-3G8	540	1620	2400	700	4	14.9	3883	3064	2732	2362	A
MTT 18-3H8	590	1620	2400	700	5.5	17	3883	3064	2732	2362	A
MTT 18-3I8	637	1620	2400	700	7.5	18.6	3883	3064	2732	2362	A
MTT 18-3J8	719	1620	2400	700	11	21.1	3883	3064	2732	2362	A
MTT 110-2G10	526	2125	2860	930	4	22.6	4229	3213	2883	2311	A
MTT 110-2H10	639	2125	2860	930	5.5	25.7	4229	3213	2883	2311	A
MTT 110-3H10	755	2045	2780	1370	5.5	28.2	4534	3518	3188	2616	B
MTT 110-2I10	723	2125	2860	930	7.5	25.3	4229	3213	2883	2311	A
MTT 110-3I10	842	2055	2790	1380	7.5	27.7	4534	3518	3188	2616	B
MTT 110-3J10	976	2110	2845	1435	11	31.5	4534	3518	3188	2616	B

- NOTE: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
 (2) Do not use catalog drawings for certified prints. Dimensions and weights are subject to change.
 (3) Adequate spacing must be allowed for access to the cooling tower. Refer to EVAPCO's Equipment Layout Manual.
 (4) Nominal capacity is based on 0.431 l/s per 10kW of heat rejection at 35°C entering water temperature, 29.5°C leaving water temperature, and 25.5°C wet-bulb temperature (3GPM per ton at 95°F to 85°F, at 78°F wet bulb).
 (5) The dimensions of C, T and fan section dimension are the individual section heights for shipment.

* **Shipping arrangement A:** Heaviest rigging section is the combined basin and casing section. Shipping height according to T + 150mm. Ships as two pieces, combined basin/casing section and separate piece fan section.
Shipping arrangement B: Heaviest rigging section is the combined casing and fan section. The tallest shipping height according to C + 150mm. Ships as two pieces, combined basin/fan section and separate piece casing section.

MODELS: MTT 112-2I12 to 112-4L12



All Inlet and Outlet Connections are: DIN 2576 Flange (Europe) Inlet DN200; Outlet DN200. Make-up MPT DN50; Overflow: FPT DN50; Drain FPT DN50

Model No.	Nominal Capacity (kW)	Weights (Kg)			Fan Motor (kW)	Air Flow (m ³ /s)	Dimensions (mm)				Shipping Arrangement
		Shipping	Operating	Heaviest Section*			H	T	P	C	
MTT 112-2I12	1014	2860	3810	1210	7.5	35.7	4248	3213	2883	2311	A
MTT 112-2J12	1203	2860	3810	1210	11	40.6	4248	3213	2883	2311	A
MTT 112-3J12	1384	2750	3700	1770	11	40	4553	3518	3188	2616	B
MTT 112-3K12	1532	2785	3740	1805	15	43.7	4553	3518	3188	2616	B
MTT 112-3L12	1652	2805	3755	1825	18.5	46.9	4553	3518	3188	2616	B
MTT 112-4L12	1728	3000	3950	2020	18.5	46.2	4858	3823	3493	2921	B

- NOTE: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
 (2) Do not use catalog drawings for certified prints. Dimensions and weights are subject to change.
 (3) Adequate spacing must be allowed for access to the cooling tower. Refer to EVAPCO's Equipment Layout Manual.
 (4) Nominal capacity is based on 0.431 l/s per 10kW of heat rejection at 35°C entering water temperature, 29.5°C leaving water temperature, and 25.5°C wet-bulb temperature (3GPM per ton at 95°F to 85°F, at 78°F wet bulb).
 (5) The dimensions of C, T and fan section dimension are the individual section heights for shipment.

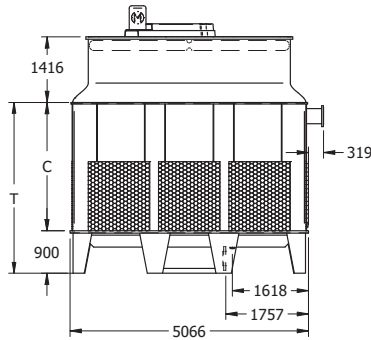
* **Shipping arrangement A:** Heaviest rigging section is the combined basin and casing section. Shipping height according to T + 150mm. Ships as two pieces, combined basin/casing section and separate piece fan section.
Shipping arrangement B: Heaviest rigging section is the combined casing and fan section. The tallest shipping height according to C + 150mm. Ships as two pieces, combined basin/fan section and separate piece casing section.

ENGINEERING DATA & DIMENSIONS

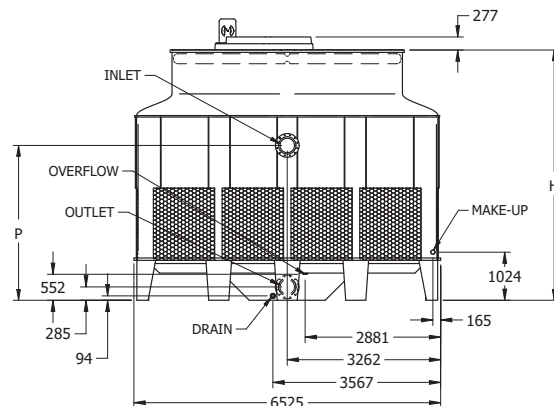
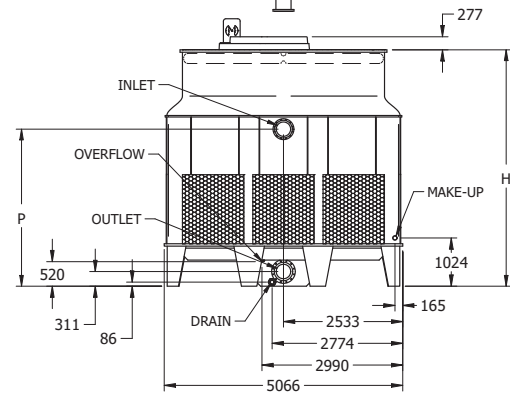
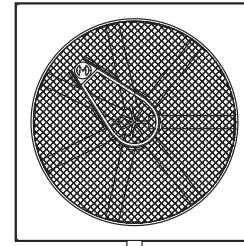
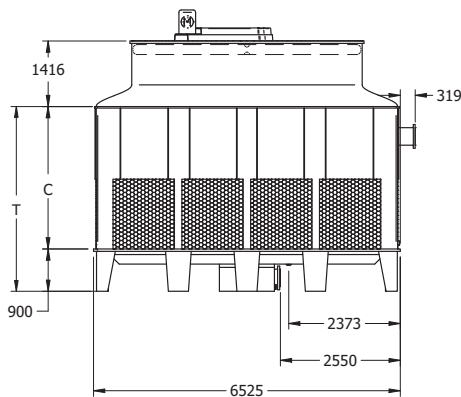
MODELS: MTT 116-2L16 to 116-4O16 MTT 120-3O20 to 120-4Q20

All connections above DN80 are standard with Table E (Australia) or DIN 2576 Flange (Europe). Connection. Connections DN80 and below are MPT or FPT.
MTT 116 models: Inlet DN300; outlet DN300
MTT 120 models: Inlet DN350; Outlet DN350

MTT 116-2L16 TO 116-4O16



MTT 120-3O20 TO 120-4Q20



Model No.	Nominal Capacity (kW)	Weights (Kg)			Fan Motor (kW)	Air Flow (m³/s)	Dimensions (mm)				Shipping Arrangement
		Shipping	Operating	Heaviest Section*			H	T	P	C	
MTT 116-2L16	2243	5640	8940	3330	18.5	73.4	5020	3670	3340	2769	B
MTT 116-3M16	2720	6035	9340	3730	22	76.6	5324	3975	3645	3073	B
MTT 116-3N16	2909	6115	9415	3805	30	84	5324	3975	3645	3073	B
MTT 116-4N16	3094	6490	9795	4180	30	82.6	5629	4280	3950	3378	B
MTT 116-4O16	3235	6495	9800	4185	37	88.7	5629	4280	3950	3378	B
MTT 120-3O20	4563	9085	15450	5755	37	128.5	5324	3975	3588	3073	B
MTT 120-4O20	4892	9695	16055	6365	37	126.3	5629	4280	3893	3378	B
MTT 120-4P20	5083	9790	16150	6460	45	134	5629	4280	3893	3378	B
MTT 120-4Q20	5315	9845	16205	6515	55	144	5629	4280	3893	3378	B

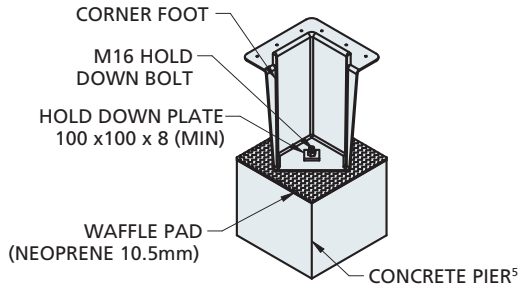
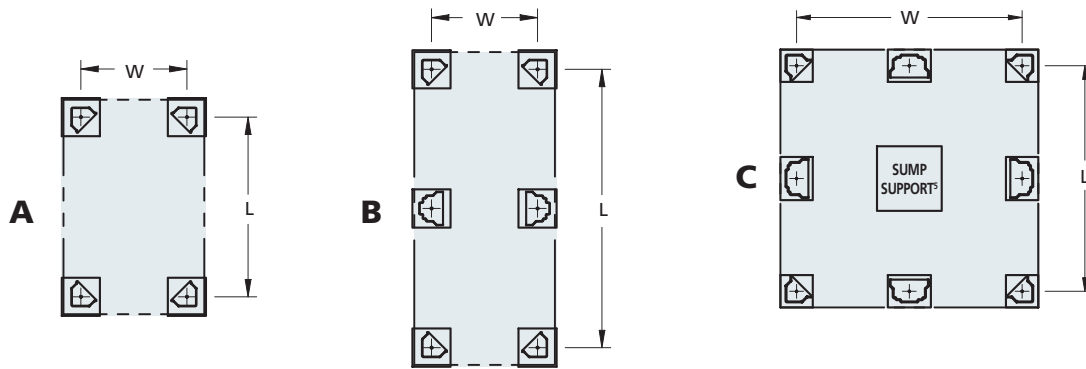
- NOTE: (1) An adequately sized bleed line must be installed in the cooling tower system to prevent build-up of impurities in the recirculated water.
 (2) Do not use catalog drawings for certified prints. Dimensions and weights are subject to change.
 (3) Adequate spacing must be allowed for access to the cooling tower. Refer to EVAPCO's Equipment Layout Manual.
 (4) Nominal capacity is based on 0.431 l/s per 10kW of heat rejection at 35°C entering water temperature, 29.5°C leaving water temperature, and 25.5°C wet-bulb temperature (3GPM per ton at 95°F to 85°F, at 78°F wet bulb).
 (5) The dimensions of C, T and fan section dimension are the individual section heights for shipment.

* Shipping arrangement B: Heaviest rigging section is the combined casing and fan section. The tallest shipping height according to C + 150mm. Ships as two pieces, combined basin/fan section and separate piece casing section.

MTT

PIER SUPPORT LAYOUT

ENGINEERING



----- UNIT OUTLINE

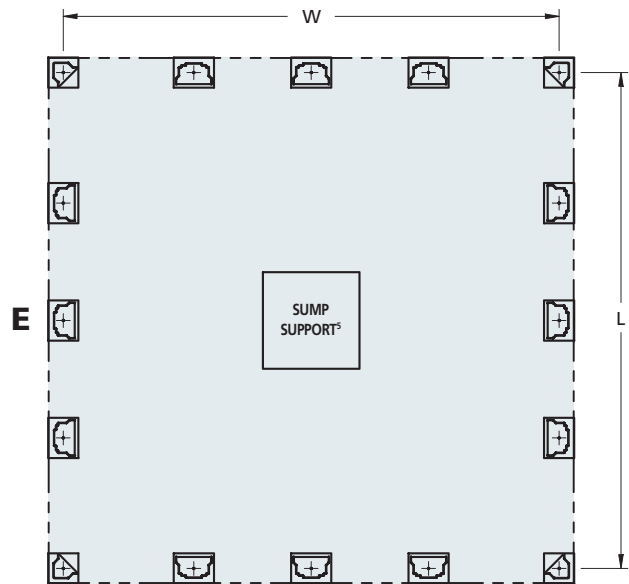
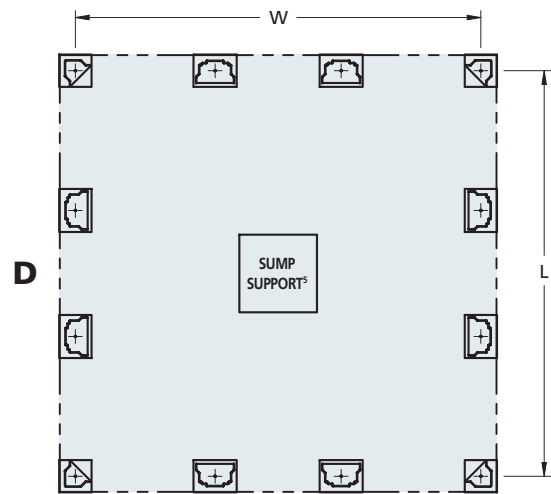


Diagram	Model	Dimension (mm)	
		W	L
A	MTT 14-2F6 to MTT 14-3G6	973	1649
B	MTT 14-2E9 to MTT 14-3F9	973	2554
A	MTT 18-2G8 to MTT 18-3J8	2013	2013
C	MTT 110-2G10 to MTT 110-3J10	2616	2616
C	MTT 112-2I12 to MTT 112-4L12	3232	3232
D	MTT 116-2L16 to MTT 116-4O16	4707	4707
E	MTT 120-3O20 to MTT 120-4Q20	6163	6163

NOTES:

- These are suggested arrangements for preliminary layout purposes. Consult your EVAPCO representative for factory certified pier support drawings and alternate layout arrangements.
- The recommended support for the MTT Cooling Tower is concrete piers located under the feet and sump (where applicable).
- Piers should be level before setting the unit in place. Do not level the unit by shimming between it and the piers.
- Concrete Piers and Anchor bolts are to be furnished by others.
- All pier dimensions should be a minimum of 300mm x 500mm. All centre sump dimensions should be minimum 1200mm x 1200mm.
- Dimensions and data are subject to change without notice. Refer to the factory certified drawings for exact dimensions.



SPECIFICATIONS

General

Furnish and install factory assembled cooling tower(s) of induced draught, counter flow design with horizontal multiple side air entries and vertical air discharge.

The total fan power should not exceed ____ kW and the total overall unit dimensions should not exceed the following:
Length: ____ mm Width: ____ mm Height: ____ mm

Approved manufacturer Evapco – model MTT _____

Thermal Performance – Performance Warranty

The tower shall be capable of performing the thermal duties as shown in the schedule and on the drawings, and its design thermal rating shall be certified by the Cooling Technology Institute (C.T.I.) and the Eurovent Certification Company (ECC). Only models with performance certified by CTI and ECC will be approved. Manufacturers' performance guarantee without CTI-ECC certification for the proposed model or an independent field performance test shall not be accepted.

Applicable Standards

- a) CTI ATC 128 Test Code for Measurement of Sound from Water Cooling Towers
- b) CTI STD 201 Standard for Thermal Performance
- c) Eurovent Rating Standard for Cooling Towers

MTT COOLING TOWER: Material of Construction

Cooling Tower Basin

- a) All cold water basin panels shall be constructed heavy-duty fibreglass of uniform thickness not less than 7 mm.
- b) All fibreglass panels shall be perfectly smooth on both faces from a closed moulding process.
- c) Each surface to be protected by UV inhibited gelcoat.
- d) All internal and external hardware in the basin section to be type 304L stainless steel (Optional SS 316L).
- e) Basin strainer shall all be type 304L stainless steel construction (Optional SS 316L).

Air Inlet Louvres

- a) The air inlet louvers shall be constructed from UV inhibited polyvinyl chloride (PVC) and is set within a PVC frame that allows for easy removal of louvers for access to the entire basin area for maintenance.
- b) The louvers shall have a minimum of two changes in air direction and shall be of a non-planar design to prevent splash out, block direct sunlight and debris from entering the basin.

Casing Section

- a) All casing panels shall be of heavy-duty fibreglass construction, perfectly smooth on both faces from a closed moulding process;
- b) Structural corner posts and intermediate posts shall be not less than 7 mm thickness. Casing panels (cladding) shall be of uniform thickness not less than 5 mm.
- c) Internal wetted steel parts within the casing shall be type 304L stainless steel (Optional SS 316L).
- d) All internal and external hardware in the casing to be type 304L stainless steel (Optional SS 316L).
- e) The casing shall totally encase the complete fill section to protect the fill from direct sunlight exposure.

Drift Eliminators

- a) The eliminators shall be constructed entirely of Polyvinyl Chloride (PVC) in easily handled sections.
- b) Design shall incorporate three changes in air direction and limit the water carryover.

Water Distribution System

- a) Spray nozzles shall be precision moulded ABS, large orifice spray nozzles utilizing fluidic technology for superior water distribution over the fill media and to minimize water distribution system maintenance.
- b) Spray header and branches shall be Polyvinyl Chloride (PVC) for corrosion resistance.
- c) Branches shall have threaded end caps to facilitate debris removal.
- d) Pipe connections shall be provided with ring flange type connections.

Heat Transfer Media

- a) Fill media shall be constructed of Polyvinyl Chloride (PVC) of cross-fluted design and suitable for sustained inlet water temperatures up to 55°C.

- b) Fill shall be self-extinguishing, have a flame spread of 5 under A.S.T.M. designation E-84-81a, and shall be resistant to rot, decay and biological attack.
- c) The cross-fluted sheets shall be bonded together for maximum strength and durability. Fill packs which are not bonded together are not allowed.

Fan Section

- a) All fandeck and cylinder panels shall be heavy-duty fibreglass of uniform thickness not less than 5 mm.
- b) Fan drive: motor base frame to be welded, heavy-duty type structural steel, hot dip galvanized after fabrication (Option SS 304L or SS 316L).
- c) Fan screen and all hardware in the fan section shall also be galvanized (Option SS 304L or SS 316L).

Access Door

An access door shall be provided to facilitate maintenance or removal of fill, drift eliminators and the water distribution system.

Belt Drive Fan

- a) Fans having diameter 1000 mm or less shall be high efficiency axial propeller type, using a high strength die cast aluminium hub and fibreglass reinforced polypropylene (PPG) wide chord blades. Each fan shall be statically balanced and installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency.
- b) Fans having diameter greater than 1000 mm shall be high efficiency axial propeller type with aluminium wide chord blade construction. Each fan shall be statically balanced and installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency.
- c) Fans designed for Super Low Sound shall be high efficiency axial propeller type with FRP hub and blade construction. Fans shall be one-piece moulded with forward sweeping blades for superior sound quality. Fans shall be statically balanced and installed in a closely fitted cowl with venturi air inlet for maximum fan efficiency.
- d) Fans shall be covered with a heavy gauge galvanized steel wire screen (Option SS 304L or SS 316L)

Direct Drive Fans

Fans having diameter less than 1000 mm shall be mounted directly on the motor shaft in a direct drive configuration.

Fan Motor

Fan motor(s) shall be totally enclosed, ball bearing type electric motor(s) with IP56 protection rating suitable for moist air service.

Sound Levels

The maximum sound pressure levels (dB) measured 15 m from the cooling tower operating at full fan speed shall not exceed the sound levels detailed below:

Location	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)
1.5 m from discharge									
1.5 m from air inlet									

ACCESSORIES

Vibration switch

- a) A vibration limit switch shall be installed on the mechanical equipment support. The purpose of this switch will be interrupt power to the motor in the event of excessive vibration.
- b) The switch shall be adjustable for sensitivity, and shall require manual reset.
- c) Wiring and sensitivity adjustment shall be by others.

Handrails, ladder and safety cage

Cooling tower(s) shall be provided with fixed ladder to service platform providing access for belt tensioning, bearing lubrication and inspection of the drive system.

Water silencers

- a) The water silencers shall be located in the falling water area of the cold water basin.
- b) The manufacturer shall submit sound data showing overall sound levels when water silencers are fitted, water running and fans at full speed measured at 1.5m from the side or end of the unit.
- c) The water silencers shall be constructed of lightweight PVC sections and able to be easily removed for access to the basin area.
- d) The water silencers shall have no impact on the unit's thermal performance.



Evapco Products are Manufactured Worldwide



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