TOWER TECH
SUSTAINABLE EFFICIENCY

Open-Circuit Design Cooling Towers

TTXR/TTXL SERIES


TOWERTECH

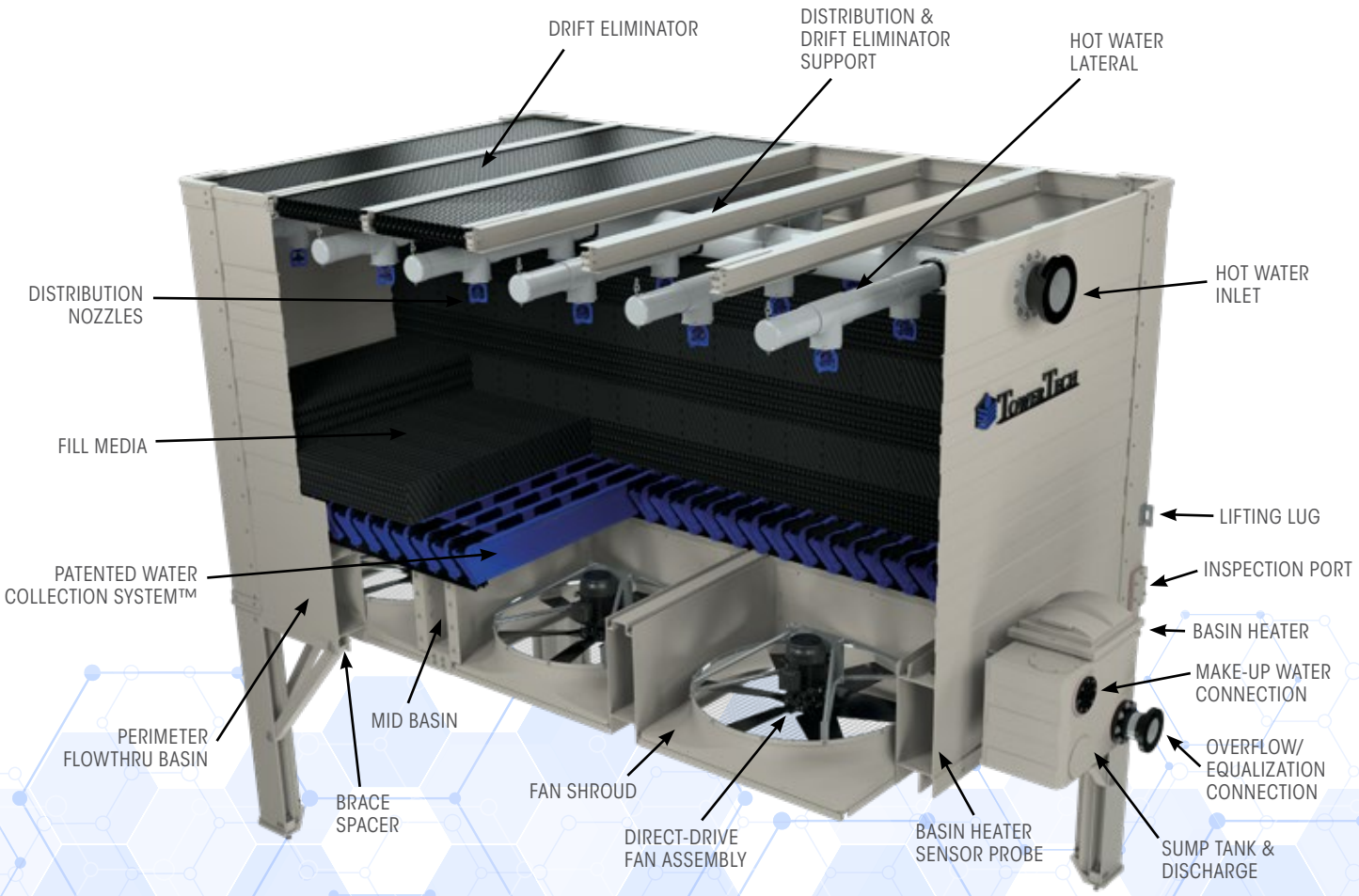
TTXR SERIES – 2" Nozzle
(more efficient/rejects more heat)

Factory Assembled Design

The TTXR Series Modular Cooling Tower is a factory-assembled modular design that allows for quick installation in less than 1-hour with a pre-engineered certified substructure that reduces infrastructure cost. Our modular towers are the most maintenance-friendly cooling tower in the world. All routine maintenance can be safely performed from ground level. Tower Tech's modular towers offer the lowest drift rate in the industry. Our innovative FlowThru™ basin and enclosed tower design reduce water usage and chemical treatment costs. Tower Tech's modular towers provide the longest service life of any factory assembled cooling tower with an industry best 15-year limited warranty. Combine all of these advantages with the energy savings achieved by Tower Tech's design and you have the best cooling tower available today.

UNIQUE DESIGN FEATURES INCLUDE

- Fully Enclosed FlowThru Basin
- Variable-Flow Rotary Spray Nozzle
- Water Collection System
- Bottom Mounted Fans
- Factory Assembled Modular Design
- Completely Non-Corrosive Materials
- 15-Year Limited Warranty



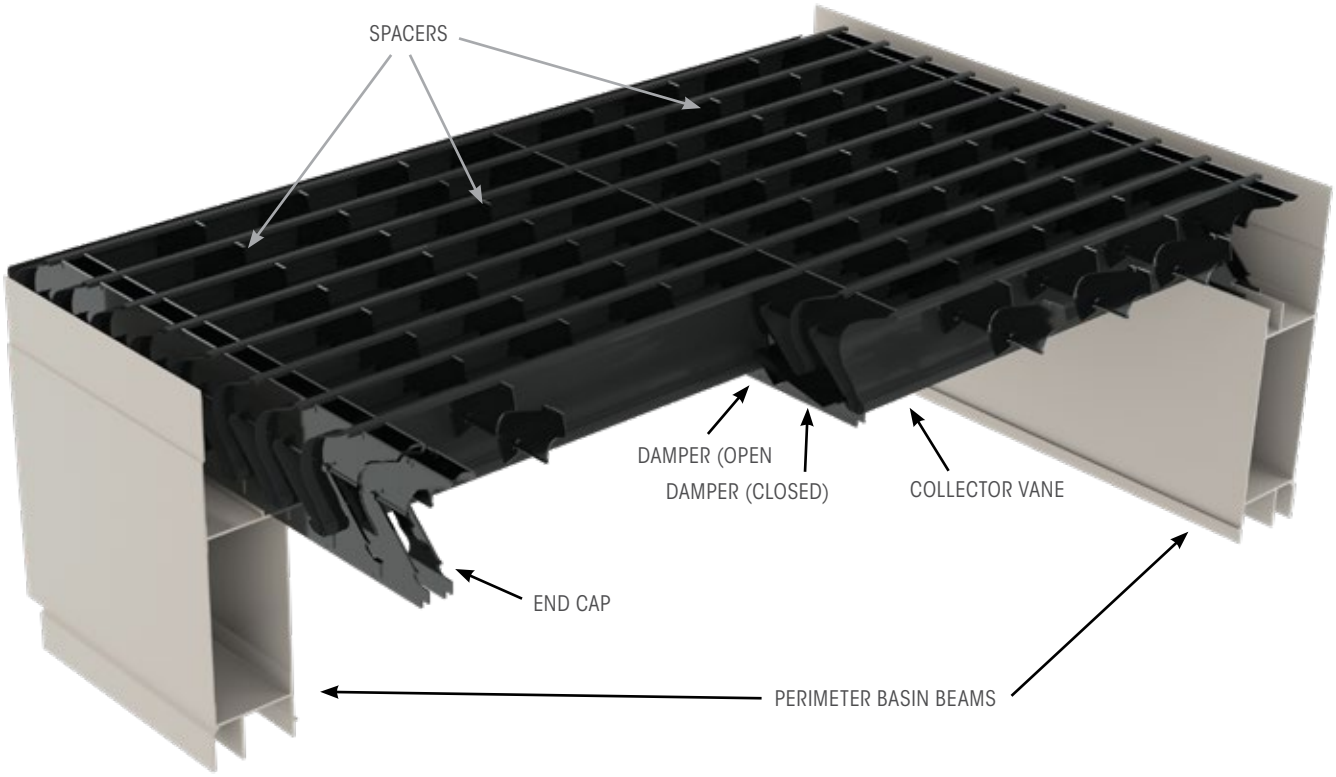
Features

"Tower Tech's modular design enables easy interconnectability to create virtually any size cooling tower and quickly accommodates future expansion of cooling tower capacity."

The TTXR Series Modular Cooling was designed for the purpose of increased performance under design conditions, smaller footprint and reduced energy usage. The performance enhancements of the TTXR model are achieved by optimization of the water distribution system through dispersing smaller water droplets for increase surface area. The TTXR models feature Tower Tech's modular plug and play interconnectivity to adapt to any project size and cooling requirements. Our modular cooling tower design quickly accommodates future expansion of cooling tower capacity.

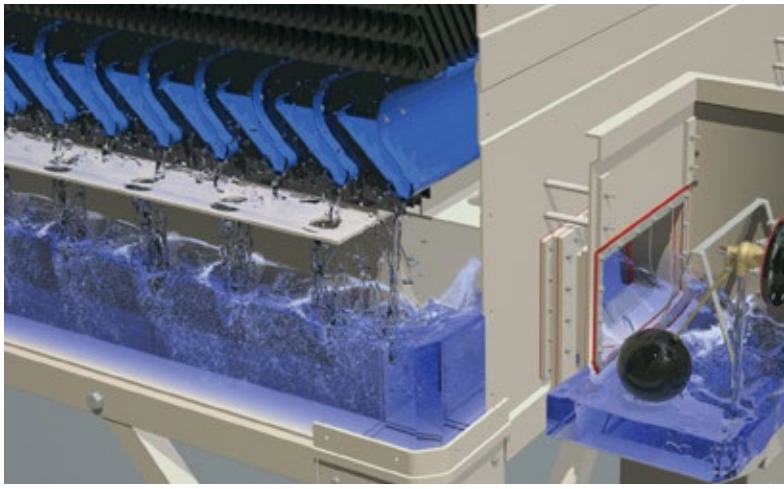
Water Collection System™

TTXR's patented Water Collection System serves as an efficient collection chamber and conduit for channeling water flow into the tower's FlowThru Basin. Its unique shape aerodynamically moves inlet air into the fill media while effectively providing a leak free barrier protecting cooling tower mechanicals.



FlowThru Basin

Unlike the low velocity cold-water settling basins common to conventional cooling tower designs, the TTXR tower incorporates a patented perimeter box beam which uniquely serves as both the cold water reservoir and provides the base structural component of the module. High water velocities in the basin beams continually scrub the walls and floor of the basin to eliminate the build-up of sediment and potentially bio-hazardous material – a common problem in conventional designs. Four access ports are provided for easy inspection.



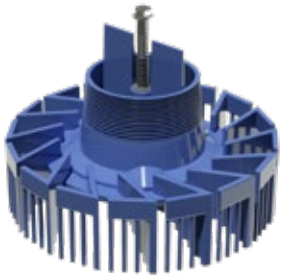
TTXR Variable-Flow Rotary Spray Nozzle™

The TTXR Series towers contain Spin-Free™ spray nozzles that delivers even fill coverage across a broad range of system flows. The Spin-Free spray nozzle can perform from 25 GPM to 75 GPM. Spin-Free spray nozzles provide a 3-1 turn down from the maximum allowed flow rate. The nozzle requires less pressure to operate than a conventional nozzle, is virtually maintenance free and dramatically improves tower performance. Debris that typically clogs conventional nozzles will pass directly through the spray nozzle. This is accomplished by the 2" (5.08 cm) nozzle throat/inlet coupled with the brisk rotating agitation action provided by the nozzle's turbine.

The innovative nozzle design is shaped to provide a square spray pattern, thereby uniformly wetting the entire fill media. This improves tower performance and reduces the likelihood of scaling due to the occurrence of dry regions within the fill. This flexible capability is not present in fixed orifice spray nozzles; they must remain very near design flow to provide the required spray coverage.

While conventional towers require a reduction in cell usage when system flow decreases, TTXR technology permits this reduced flow to be evenly distributed over all available fill area. This results in maximizing cooling capacity and energy efficiency under partial-load duties.

Optional TTXL Model Features Oversize Variable-Flow Rotary Spray Nozzles



The patented Variable-Flow Rotary Spray Nozzles in the TTXL deliver even fill coverage across a broad range of system flows from 100 to 300 gpm per nozzle (6.5 to 19.5 lps) at low pressures from .5 to 1.5 psi (3.45 to 10.3 kPa). The nozzle requires less pressure to operate than a conventional nozzle, is virtually maintenance free, and dramatically improves tower performance. Use of a lateral spray pattern allows the nozzle to be positioned just one inch off the fill material, saving several feet of pump head. The nozzle's turbine-driven rotor spins on a water bearing that keeps the nozzle parts from wearing, as well as provides the needed agitation to ensure virtually clog-free service.

Motors/Fans/Shrouds

All current Tower Tech modular cooling towers are equipped with direct-drive motors, totally enclosed air over (TEAO), 8-pole, induction- type, inverter-ready, with Class H (Class F minimum) insulation, and L10 sealed bearings rated for 100,000-hour life with sealed case. 60 Hz motors have a nominal RPM of 860. 50 Hz motors have a nominal RPM of 715.

All motors meet IP55 and NEMA MG-1 Parts 30 and 31 requirements. Motor type and power level depends on tower model selected and required design conditions.

STANDARD AVAILABLE MOTOR TYPES

- 60Hz 40°C - Available in 3.0 HP, 5.0 HP, or 7.5 HP
  Available at 200V, 230V, 460V and 575V
- 60Hz 50°C - Available in 3.0 HP, 5.0 HP (2.9kW) or 7.5 HP
  Available at 230V, 380V or 460V
- 50Hz 40°C - Available in 2.2 kW, 3.7 kW, 4.8 kW or 5.6 kW
  Available at 190V-208V, 220V, 380V-415V or 440V
- 50Hz 50°C - Available in 2.9 kW or 4.5 kW
  Available at 190V-208V and 380V-415V

Tower Tech fans use high-efficiency molded thermoplastic blades with a unique airfoil design resulting in uniform airflow and minimal turbulence to maximize system efficiency. Adjustable- pitch blades along with lightweight, high-strength cast aluminum-silicon alloy hubs simplify field adjustments. Blade tip tolerances are quality control validated in order to ensure maximum system efficiencies. Tower Tech's stainless steel tubular motor-mount minimizes air turbulence for quiet operation and reduces corrosion for long-life.

The TTXR Series precision molded fan shroud is manufactured from advanced FRP composite material. It is engineered to provide a smooth air entry (optimized r/d) and approach velocity. The heavy-duty FRP shroud is lightweight and will resist corrosion indefinitely.

Fill & Drift Eliminators

TTXR Series cooling towers are equipped with rigid cross-corrugated, high-efficiency PVC film fill media (10 mil thickness). This fill media is resistant to biological degradation and to most chemicals (inorganic alkalis or acids as well as organics) common to cooling tower systems. Its high surface area to volume ratio provides optimum heat exchange efficiency. The TTXR tower shell may be equipped with configurations to meet any water quality demand – alternative thermal capacity ratings are available from your Tower Tech design engineer. In addition to PVC our cooling towers may be optionally equipped with HPVC fill suitable for use in "hot water" applications within a working range of 130°F to 155°F (54.4°C to 60°C). Alternative 15 mil thickness material is also available as a specified option.

Our open-circuit cooling towers are equipped with low-pressure sinusoidal-wave shaped PVC drift eliminators (15 mil finished thickness). These high-efficiency cells (drift loss guaranteed not to exceed 0.0004%) force the exiting airstream to make three distinct directional changes causing exiting moisture droplets to impinge and coalesce on its high surface areas. The PVC material used in the construction is virtually impervious to rot, decay or biological attack. An ultraviolet inhibitor engineered into the product extends the life-expectancy.

Materials of Construction

The Tower Tech cooling tower structure is factory-assembled and constructed primarily of structural FRP and stainless steel hardware, which together provide a rigid shell and framework for the tower that will resist deterioration and corrosion indefinitely. There are no galvanized or wood components which could potentially leak hazardous chemicals into the environment. Walls are joined together by tongue and groove joints and are sealed by a polyurethane sealant to prevent leaks. Stainless steel fasteners employing coated threads (in wetted areas) are used to bolt the walls together and ensure leak-free operation under pressurized operating conditions.

Component	Material
Fill Media	10 mil PVC (std.), 15 mil PVC (opt.)
Drift Eliminators	10 mil PVC (Thermoformed)
Spin Free Nozzle	HDPE & Stainless Steel
Water Distribution Header & Laterals	PVC
Water Collection System	ABS (Injection Molded & Extruded)
Header Inlet Flange	PVC (Injection Molded)
Hardware	304 Stainless Steel
Corner Enclosure	FRP (Pultruded)

Component	Material
Shell/Casing	FRP (Pultruded)
Sub-Structure Legs	FRP (Pultruded)
Wind Wall Partitions	ABS (Extruded)
Modular Base Support & Footpad	Nylon (Injection Molded)
Fan Shroud	Hand Lay-Up Fiberglass (Flame Retardant)
Sump Box	PP (Rotationally Molded)
Inspection Ports	Nylon (Injection Molded)
Motor Support	304 Stainless Steel

Key: FRP = Fiberglass Reinforced Plastic Pultrusion
PVC = Poly-Vinyl Chloride (Self-Extinguishing)
ABS = Acrylonitrile, 1,3-Butadiene, and Styrene Copolymer (Flame Retardant)
PP = Polypropylene

TTXR Model	Weight in Lbs. (kg)		Dimensions per Illustration Below[a] (cm)						
	Shipping[b]	Operating	A	B	C	D	E	F	G
i219xx	4,360 (1,978)	9,470 (4,305)	7'-00" (213.4)	3'-06" (106.7)	10'-01" (307.3)	4'-00" (121.9)	6'-00" (182.9)	17'-00" (518.2)	13'-06" (411.5)
i319xx	6,155 (2,792)	12,991 (5,905)	7'-00" (213.4)	3'-06" (106.7)	10'-01" (307.3)	4'-00" (121.9)	6'-00" (182.9)	17'-00" (518.2)	13'-06" (411.5)
i419xx	7,950 (3,606)	16,503 (7,501)	7'-00" (213.4)	3'-06" (106.7)	10'-01" (307.3)	4'-00" (121.9)	6'-00" (182.9)	17'-00" (518.2)	25'-00" (762.0)
0419xx	7,800 (3,538)	14,394 (6,543)	12'-00" (365.8)	6'-00" (182.9)	9'-11" (302.3)	6'-00" (182.9)	6'-00" (182.9)	17'-00" (518.2)	13'-06" (411.5)
i519xx	9,745 (4,420)	20,024 (9,102)	7'-00" (213.4)	3'-06" (106.7)	10'-01" (307.3)	4'-00" (121.9)	6'-00" (182.9)	17'-00" (518.2)	30'-09" (937.3)
i619xx	11,540 (5,235)	23,553 (10,706)	7'-00" (213.4)	3'-06" (106.7)	10'-01" (307.3)	4'-00" (121.9)	6'-00" (182.9)	17'-00" (518.2)	36'-06" (1,112.5)
0619xx	10,775 (4,887)	19,587 (8,903)	12'-00" (365.8)	6'-00" (182.9)	9'-11" (302.3)	6'-00" (182.9)	6'-00" (182.9)	17'-00" (518.2)	19'-03" (586.7)
0819xx	13,750 (6,237)	24,780 (11,264)	12'-00" (365.8)	6'-00" (182.9)	9'-11" (302.3)	6'-00" (182.9)	6'-00" (182.9)	17'-00" (518.2)	25'-00" (762.0)
1019xx	16,855 (7,645)	29,964 (13,620)	12'-00" (365.8)	6'-00" (182.9)	9'-11" (302.3)	6'-00" (182.9)	6'-00" (182.9)	17'-00" (518.2)	30'-09" (937.3)
1219xx[c]	19,700 (8,936)	35,156 (15,980)	12'-00" (365.8)	6'-00" (182.9)	9'-11" (302.3)	6'-00" (182.9)	6'-00" (182.9)	17'-00" (518.2)	36'-06" (1,112.5)

[a] Dimensions are approximate and should not be used for construction purposes. Dimension E may be 1'-00" (30.5cm), 4'-00" (121.9cm), 6'-00" (182.9cm), 8'-00" (243.8cm), 10'-00" (304.8cm), or 12'-00" (365.8cm) depending on project requirements. 12'-00" (365.8cm) may be specified with prior approval of Tower Tech engineering manager only. Dimension E on drawing below is 6'-00" (182.9cm).

[b] Tower weights may vary due to optional equipment, residual water from factory testing, rain, etc. Weights shown are guidelines only and do not include sump, substructure or other accessories not directly attached to the tower module during shipping.

[c] TTXR-1219xx requires two sumps. See TTXR-1219xx drawings on Tower Tech website.

PACE (Performance and Competitive Evaluation)

PACE is proprietary software that is designed to elevate the thinking and behavior of the cooling tower market. Tower Tech believes PACE has the potential to change the way cooling towers are specified and purchased with total cost of ownership. PACE is the only competitive analysis software offered by a cooling tower manufacturer. Use PACE for your next cooling tower project to understand your potential ROI.

PACE generates a report document called a Performance and Competitive Evaluation. The Performance and Competitive Evaluation compares the performance and operating costs of a given Tower Tech TTXR Series Modular Cooling Tower with the performance and operating costs of a given opposition cooling tower. Results include a report on tower performance and the cost of fan energy, pump energy, water, and chemicals consumed by the cooling tower and the rest of the chiller loop. Addressing these challenges continues to be the driving force behind the growing popularity of the Tower Tech design.

Most cooling towers buyers focus on the initial cost to purchase the equipment even though it amounts to less than 20% of the full life-cycle cost of owning and operating the equipment. The evaluation of the full life-cycle cost analysis of the cooling tower is not always the highest priority. The results of PACE can show that combining a competitive first costs with lower operating costs plus lower maintenance costs will provide payback within a few years. Over the expected 30-year lifespan of a Tower Tech cooling tower, the potential savings will more than pay for the initial cost of the cooling tower several times over. For buildings with comfort cooling systems, almost a full 1/3 of the utility bills are a result of air conditioning requirements. In fact, when looking at the life-cycle cost of owning and operating a water-cooled system more than half the cost is the result of energy cost with the remaining cost attributed to maintenance, water usage and chemical treatment.

Upgrades & Accessories

Tower Tech offers a full range of upgrades, accessories and after-market equipment to compliment your cooling tower project. Tower Tech can provide accessories to lower installation cost and controls to optimize the operational efficiency of your system.

- StormStrong® certified substructure for wind loads up to 200mph and OSHPD pre-approved
- Control panel and VFD packages with gateway communication options for BMS integration
- Basin Heater packages
- Water level control with standard mechanical float level or option electronic level control
- Motor pre-wiring to junction box, motor protection panel or disconnects

Peace of Mind with StormStrong

StormStrong cooling towers are engineered and built out of structural FRP composites and can stand up to hurricane-force winds and other weather-related stresses. As a standard offering, all Tower Tech StormStrong towers have engineering certifications covering Zone 4 seismic restraint with OSHPD approval and 200 MPH wind loading and wind pressures that exceed requirements for severe storms. Acoustic certifications are also available, and the thermal performance of all TTXR and TTXL open-circuit towers is certified by the Cooling Technology Institute (CTI).

After-Market Service

Tower Tech offers more than just a superior product. Tower Tech provides expert solutions that extend beyond the initial purchase. Our customer for life commitment extends across all services provided by Tower Tech including customer service. Our factory-certified service team can assist you with the maintenance of your tower. Our Customer Service Hot Line gives customers a personal link to highly experienced Service Representatives who can help you create a preventive maintenance plan for inspections and service plus provide immediate answers to any technical questions, and help you obtain spare and replacement parts as needed. Tower Tech has a fully-staffed customer service department capable of providing industry leading service, repair, commissioning and troubleshooting wherever you are located. Our preventative maintenance program assures peak tower performance through the lifespan of your investment.

Keep Your Cool with Temporary Cooling Towers

Imagine the impact a cooling water loss would have on your system. Oftentimes production is limited as the result of cooling capacity. Required maintenance on cooling towers is delayed due to lack of extra capacity or redundant cooling. Each day brings new regulations limiting your cooling water system. When every minute and degree of cold water matters, you can always count on Tower Tech. Tower Tech rentals can increase performance while reducing risk. Even when needs are temporary our experts provide solutions to keep your operations cool. Tower Tech pioneered the temporary cooling tower industry in the 1980s and still leads the industry in design innovations. Most companies don't consider temporary cooling towers because don't know about high-efficiency towers that are factory built and portable like Tower Tech.

About Us

Tower Tech provides innovative solutions for all your cooling tower needs. As the industry's most notable innovator, Tower Tech delivers the most advanced cooling tower design across numerous industrial markets and around the globe. From utility and industrial process applications to commercial comfort cooling needs, there is a modular tower configuration to meet any thermal demand. Tower Tech continues to break boundaries and improve on what others accept as "best". Tower Tech's four key tower design innovations ensure that your cooling project will be well positioned to service important demands: 1) energy efficiency, 2) water conservation, 3) maintenance friendly operation and 4) workplace and environmental safety.


TowerTech
WARNING
PRECAUTION
CAUTION

TOWER TECH
SUSTAINABLE EFFICIENCY

Tower Tech

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