

ISO 9001
COMPANY



SERIES 1500 COOLING TOWERS

COOLING
TOWERS

CLOSED CIRCUIT
COOLING

THERMAL
STORAGE

REFRIGERATION



Baltimore Aircoil



Series 1500 Cooling Towers

Minimize *the Total Cost of Ownership*

Series 1500 Cooling Towers are designed to minimize operating costs, installation costs, and maintenance costs for both new and replacement cooling tower projects. Constructed of energy-efficient components, Series 1500 Cooling Towers deliver independently verified thermal performance over a wide range of flow and temperature requirements. Years of operating experience and extensive research and development have resulted in standard design features that minimize the costs associated with enclosures, support requirements, electrical service, piping, and rigging. Superior maintenance and access features ensure consistent thermal performance between scheduled maintenance periods. Innovative performance enhancing options and corrosion resistant materials of construction alternatives allow each unit to be customized to meet specific project requirements.



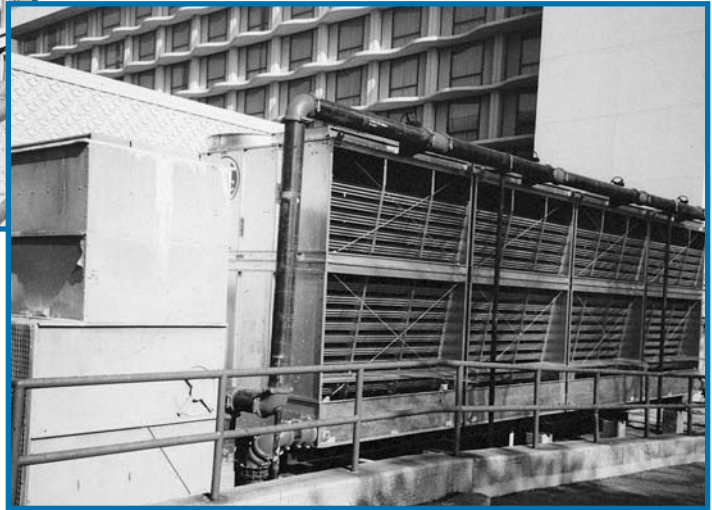
Series 1500 Cooling Towers

- Ideal replacement unit
- Low energy consumption
- Complies with ASHRAE Standard 90.1 Energy Efficiency requirements
- Reliable year-round operation
- Low installed cost
- Long service life
- Easy maintenance

Ideal Replacement Unit



Before



After

- **Support Steel** – Series 1500 Cooling Towers are designed to mount directly on existing support steel designed for many counterflow/crossflow cooling towers, eliminating the need to replace support steel.
- **Electrical Service** – Energy requirements of the Series 1500 Cooling Tower are designed to match existing counterflow/crossflow cooling towers. In many counterflow replacements, the Series 1500 Cooling Tower will require half the connected fan horsepower.
- **Enclosures** – The Series 1500 Cooling Tower fits in most enclosures originally designed for older centrifugal or axial fan cooling towers with little or no modifications to existing walls. The single air inlet design provides installation flexibility allowing the Series 1500 to easily fit in tight wells or alcoves.



Single air inlet allows Series 1500
Cooling Towers to fit most
existing enclosures

Proven Advantages



Low Energy Consumption

- **Axial Flow Fan** – Fan energy requirements are approximately half the energy requirements of centrifugal fan units.
- **BACross® Wet Deck Surface** – The wet deck surface provides maximum air/water contact time, low pressure drop and improved thermal performance.
- **Fan Motor Options** – Various fan motor options, such as the Independent Fan Motor System, ENERGY-MISER® Fan System, two-speed motors, and inverter duty motors are available to further lower energy consumption.

ASHRAE Standard 90.1-2001

ASHRAE Standard 90.1-2001 (Energy Standard for Buildings Except Low-Rise Residential Buildings) provides the minimum requirements for the design of energy-efficient buildings. All Series 1500 Cooling Towers comply with the energy efficiency requirements established by ASHRAE Standard 90.1-2001.

Reliable Year-Round Operation

- **Separate Air Inlet Louvers** – The air inlet louvers are constructed of heavy-gauge, UV resistant, corrosion-resistant fiberglass reinforced polyester (FRP).
- **BALTIDRIVE® Power Train** – Backed by a five-year fan drive and motor warranty, the BALTIDRIVE® Power Train utilizes special corrosion-resistant materials of construction and state-of-the-art technology to ensure ease of maintenance and reliable year-round performance.

Low Installation Cost

- **Single Side Air Inlet** – Units can be placed close to solid walls, which reduces the size of enclosures to allow for more profitable use of premium space.
- **Modular Design** – The modular design minimizes the size and weight of the heaviest piece for lifts allowing for the use of smaller, less costly cranes.



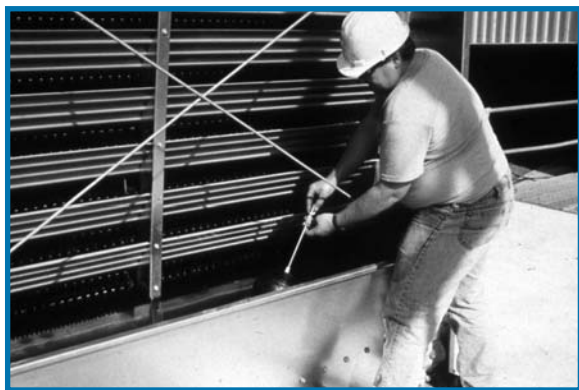


Long Service Life

- **Optional Materials of Construction** – For applications requiring additional corrosion protection, Series 1500 Cooling Towers are available with the BALTIMOND® Corrosion Protection System and Type 304 stainless steel components.



Standard G-235 galvanized steel cooling tower



Access to strainer, make-up and basin accessories from outside the tower.

Easy Maintenance

- **Sloped Cold Water Basin** – The wet deck surface is elevated above the sloped basin floor to facilitate flushing of dirt and debris from this critical area.
- **Large Access Doors** – Large access doors provide easy entry to the spacious plenum area to perform routine maintenance.
- **Accessibility** – Make-up, drain, overflow and optional basin accessories are accessible from outside the unit.
- **Inlet Strainer** – Dirt and debris are collected by an integral strainer before clogging the nozzles. The strainer is accessible from a portable ladder or from the optional external service platform.



Standard inlet strainer

Heavy Duty Construction

- G-235 (Z700 metric) hot-dip galvanized steel panels
- Alternative materials of construction available

Low HP Axial Flow Fans

- Quiet operation
- Corrosion-resistant, aluminum construction

BALTIDRIVE® Power Train

- Premium quality, solid backed, multi-groove belt
- Corrosion-resistant cast aluminum sheaves
- Heavy duty bearings (280,000 Hr. Avg. Life)
- Proven, totally enclosed air-over (TEAO) fan motor
- Five-year motor and drive warranty



Water Distribution System

- Low pump head gravity distribution basin
- Uniform water distribution over a wide range of flow conditions
- Proven design, non-clog nozzles
- Heavy-duty steel covers in easy-to-remove sections
- Integral strainer

BACross® Wet Deck Surface with Integral Drift Eliminators

- Polyvinyl chloride (PVC)
- Impervious to rot, decay or biological attack
- Flame spread rating of 5 per ASTM E84-77a
- Elevated above the cold water basin for easy maintenance

FRP Air Inlet Louvers

- Corrosion-resistant
- UV resistant finish
- Prevent water splash-out
- Maintenance free
- Minimize scaling potential on face of wet deck

Oversized Access Doors

- One (1) inward swinging door on each end wall with easy latch handle

Cold Water Basin

- Sloped cold water basin for easy cleaning
- Suction strainer with anti-vortex hood
- Adjustable water make-up assembly
- Integral internal walkway as standard



Construction Alternatives

Standard Corrosion Resistant Construction

All steel panels and structural elements of the Series 1500 Cooling Tower are constructed of heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel. The ASTM designation G-235 (Z700 metric) means that the weight of protective zinc coating is 2.35 ounces per square foot of steel surface, as verified by the ASTM A525 Triple-Spot Test. A zinc-rich primer is applied to the cut edges of all hot-dip galvanized components prior to assembly. This standard construction will provide corrosion protection and long life for most air conditioning, industrial cooling, and refrigeration applications.

Optional BALTIBOND® Corrosion Protection System

The BALTIBOND® Corrosion Protection System was developed by BAC specifically for increased protection from adverse operating conditions. The manufacturing process fuse bonds a special hybrid polymer to all hot-dip galvanized steel components of the cooling tower, extending the life of the base material. Tens of thousands of BAC installations worldwide prove the effectiveness and durability of the corrosion protection system. (For further details, see BAC Bulletin S650/1-0).



BALTIBOND® Corrosion Protection System
Manufacturing Facility

Optional Stainless Steel Cold Water Basin

A welded, Type 304 stainless steel basin is available to increase cold water basin corrosion protection and eliminate leaks in this critical component. All seams between panels inside the cold water basin are welded. The basin is leak tested at the factory and is provided with a five-year leak proof guarantee. The steel panels and structural members above the cold water basin can be constructed of standard G-235 (Z700 metric) hot-dip galvanized steel or the optional BALTIBOND® Corrosion Protection System.

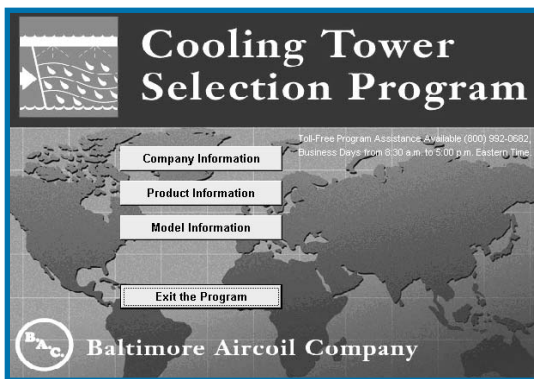
Optional 304 Stainless Steel Construction

Each Series 1500 Cooling Tower constructed of Type 304 stainless steel is designed for applications exposed to extremely corrosive conditions or where the ultimate in corrosion protection and long life are desired. All steel panels and structural elements, including the casing panels, hot and cold water basins, fan deck, and mechanical equipment supports are constructed of Type 304 stainless steel. All seams between panels inside the cold water basin are welded. The basin is leak tested at the factory and is provided with a five-year leak proof guarantee.

Selection Software

Easy-To-Use Selection Software

BAC offers easy-to-use selection software to assist customers in the selection and evaluation of Series 1500 Cooling Towers. In addition to the catalog models, CTI certified low-horsepower selections are available from the selection software. The program provides equipment specifications, engineering data, performance curves, layout recommendations, sound data and other information to aid in selecting the best BAC cooling tower for your application.



Cooling Tower Selections

All cooling tower models selected with the selection program are included in CTI's Thermal Performance Certification Program. The selection program also provides the ability to make selections outside the scope of CTI's Thermal Performance Selection Program. BAC guarantees the thermal performance of all cooling towers made by the selection program.

Cooling tower selections often contain reserve capacity at the design conditions. The selection program optimizes the performance of the tower at specified conditions. Select the unit and maximize flow rate, hot and cold water temperatures, wet bulb temperature or approach.

Accessories

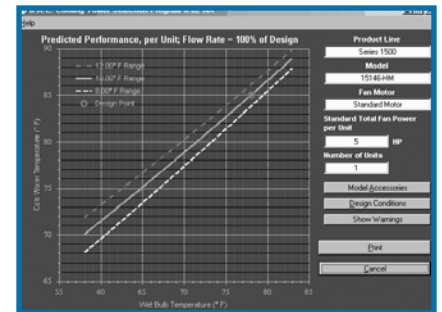
The selection program evaluates the use of low-sound fans, intake and discharge sound attenuation. Units supplied with low-sound fans include a 3% thermal derate while units supplied with intake sound attenuation include a 5% thermal derate. The use of discharge attenuation does not require a thermal derate.

Alternative Motors

Standard selections utilize a standard horsepower motor to meet the full load performance required for the project. Alternative selections based on using the ENERGY-MISER® Fan System, 2-speed motors or inverter duty motors, used for variable frequency drive applications, are also available.

Performance Curves

The selection program generates performance curves, based on flow rates ranging from 80% to 120% of the design flow rate.



Sound Data

For sound-sensitive applications, the selection program provides sound ratings at 5 and 50-foot distances for your reference. Sound ratings are available for standard selections as well as for units provided with low-sound fans and sound attenuation.

Web Site

The BAC selection software is available from our web site, www.BaltimoreAircoil.com. Direct links to the web site provide users of the selection program with additional information pertaining to Unit Engineering Data, Certified Unit Drawings, Layout Guidelines and Specifications. Consult your local BAC Representative for additional application assistance.



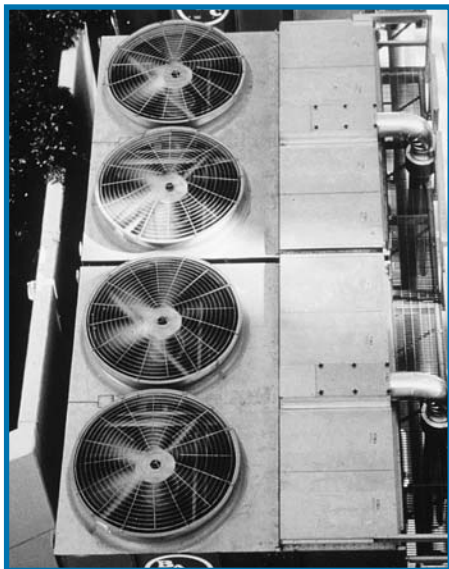
Optional Accessories

Low Sound Alternatives

As society becomes increasingly concerned about the quality of its environment, sound is an important consideration in the selection and location of sound-generating equipment. The mechanical equipment of the Series 1500 Cooling Tower is carefully selected to produce optimum cooling tower thermal performance with minimal sound levels. The low-sound levels generated by the Series 1500 Cooling Tower make them suitable for installation in most environments.

For situations when one direction is particularly sound sensitive, the unit can be oriented so that the quiet side, opposite the air inlet, faces toward the sound-sensitive direction.

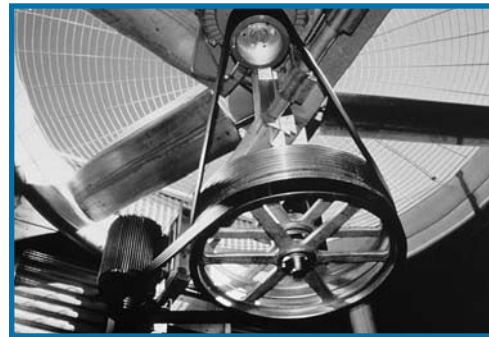
For very sound-sensitive installations, Series 1500 Cooling Towers are available with low-sound fans which significantly reduce the sound levels generated from the tower with minimal impact on thermal performance. The cooling tower thermal performance with the low-sound fan has been certified by the Cooling Technology Institute in accordance with CTI Standard STD-201.



Sound sensitive installation with quiet side facing critical neighbor

For extremely sound-sensitive installations, factory-designed, tested and rated sound attenuation is available for both air intake and discharge for the Series 1500 Cooling Towers.

ENERGY-MISER® Fan System



The ENERGY-MISER® Fan System consists of two standard, single-speed fan motors and drive assemblies. One drive assembly is sized for full speed and the other is sized for approximately 2/3 speed and consumes only 1/3 the design horsepower. The ENERGY-MISER® Fan System is the only drive system that provides stand-by protection in the event of a motor failure. As a minimum, approximately 70% capacity will be available from the low-horsepower motor, even on a design wet bulb day. Reduced operating costs can be achieved during off-peak operation by taking advantage of the ENERGY-MISER® Fan System. The ENERGY-MISER® Fan System is an energy-saving capacity control alternative to two-speed motors.

Independent Fan Operation

Series 1500 Cooling Tower models 15296 through 15425 are provided with one fan motor driving two fans. The Independent Fan option consists of one fan motor and drive assembly for each fan to allow independent operation of each fan. This option adds an additional step of fan cycling and capacity control.

Optional Accessories

Vibration Cutout Switch

A factory-mounted, UL/CSA approved solid-state electronic vibration cutout switch is available to effectively protect against equipment failure due to excessive vibration of the mechanical drive system. The switch features a 20 second start-up time delay and adjustable run time delay to minimize false tripping and is factory preset for normal cooling tower operation. A NEMA 4X enclosure ensures reliable protection and trouble-free operation in the moist cooling tower environment. For projects where an external power source is not available, a mechanical vibration cutout switch is available. Both types of switches provide reliable performance.

Internal Walkway and Service Platforms, and External Service Platforms

A standard galvanized steel internal walkway is one means of providing a permanent working surface for easy access to the fan drive. For access to the motor and drive assemblies on models 15296 through 15425, an internal ladder and upper service platform with handrails are available.

For external service, louver face platforms and access door platforms are other options that can be added to the cooling tower either when the unit is purchased or as an aftermarket item. Safety gates are available for all handrail openings supplied by BAC. CTI Certification is maintained when internal and external platforms are provided.



External louver face platform



Internal service platform with ladder



Standard internal walkway



Basin Heaters

Cooling towers exposed to below-freezing ambient temperatures require protection to prevent freezing of the basin water when the unit is idle. Factory-installed heaters which maintain +40°F basin water temperature at +0°F or -20°F ambient are a simple and inexpensive way of providing such protection.

Model Number	0°F Ambient	-20°F Ambient
15146 to 15282	8 kW	12 kW
15296 to 15425	12 kW	16 kW

Electric Water Level Control Package

This option replaces the standard mechanical make-up valve when more accurate water level control is required. The electric water level control package consists of a conductance-actuated level control mounted in the cold water basin and a slow closing solenoid in the make-up water line. The solenoid valve may require a pressure reducer (supplied by others) for water supply pressure greater than 40 psig.

Extended Lubrication Lines

Extended lubrication lines with standard grease fittings are available for lubrication of the fan shaft bearings. Fittings are located inside the plenum area next to the access door.

FM Approval

All multi-cell Series 1500 Cooling Towers are available with Factory Mutual (FM) approved construction as an option. Consult your local BAC Representative for additional application assistance.

Air Inlet Screens

Hot-dip galvanized wire mesh screens are available factory-installed over the air inlet louvers to prevent debris from entering the tower.

Basin Sweeper Piping

Basin sweeper piping is an effective method of eliminating debris which may collect in the cold water basin of the tower. A complete piping system, including nozzles, is provided for connection in the tower basin to side stream filtration equipment (by others).

Side Outlet Depressed Sump Box

A side outlet depressed sump box is available for field installation below the base of the tower to facilitate jobsite piping. The outlet connection is designed to mate with an ASME Class 150 flat face flange.

High Temperature Wet Deck

Optional, high-temperature PVC wet deck surface allows entering water temperatures up to 135°F.

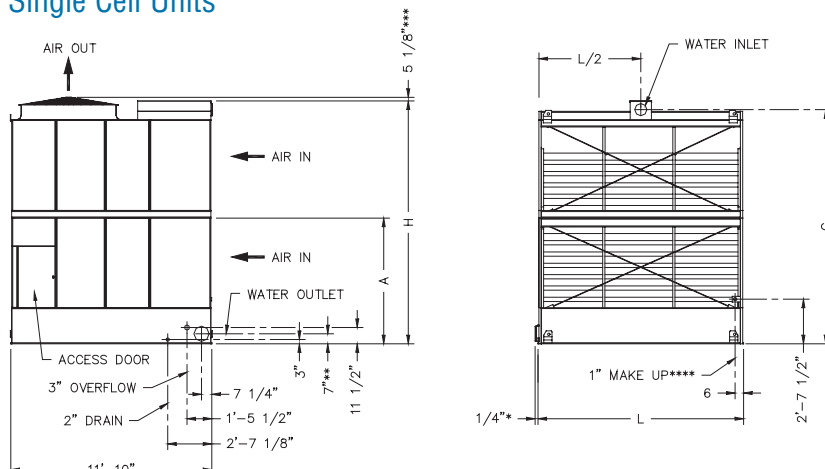
IOBIO® Bacteria, Slime, and Algae Control

The IOBIO® Bacteria, Slime, and Algae Control is available to control the growth of microorganisms associated with open recirculating cooling water by automatically dispensing a precise and very low concentration of elemental iodine into the recirculating water.

Engineering Data

Do not use for construction. Refer to factory certified dimensions.
This brochure includes data current at time of publication which should be reconfirmed at the time of purchase. Detailed drawings can be downloaded from the BAC web site, www.BaltimoreAircoil.com.

Single Cell Units

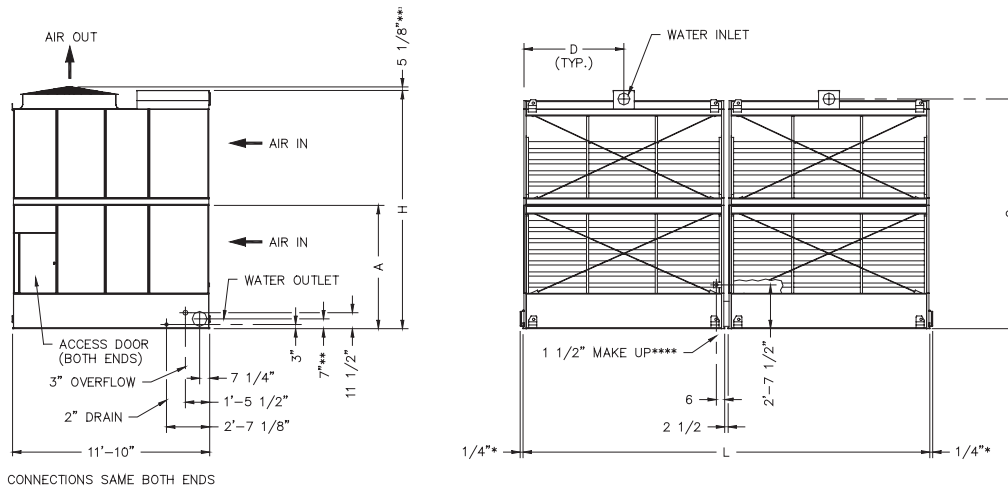


*15296 through 15425 - 2 1/8"
**15296 through 15425 - 8"
***15146 through 15219 and 15296 through 15425 - 2 3/4"
****15296 through 15425 - 1 1/2"

Model Number	NOM Tons ¹	STD Motor HP	Dual Motor Option	CFM	Weight (LBS.)				Dimensions				Inlet ³ Conn.	Outlet ³ Conn.
					Shipping	Nominal Oper ²	Max Oper ²	Heaviest Section ⁵	L	H	A	C		
15146	146	7.5	N/A	40,320	3,940	7,450	7,920	3,940	8'-6"	10'-3"	N/A	9'-9"	6"	8"
15160	160	10	N/A	44,190	3,960	7,540	7,940	3,960	8'-6"	10'-3"	N/A	9'-9"	6"	8"
15176	176	15	N/A	48,160	4,010	7,640	7,990	4,010	8'-6"	10'-3"	N/A	9'-9"	6"	8"
15162	162	7.5	N/A	43,080	4,200	7,990	8,610	4,200	8'-6"	11'-7"	N/A	11'-1"	6"	8"
15177	177	10	N/A	47,070	4,220	8,100	8,630	4,220	8'-6"	11'-7"	N/A	11'-1"	6"	8"
15201	201	15	N/A	53,450	4,280	8,290	8,690	4,280	8'-6"	11'-7"	N/A	11'-1"	6"	8"
15219	219	20	N/A	58,240	4,300	8,360	8,710	4,300	8'-6"	11'-7"	N/A	11'-1"	6"	8"
15200	200	10	N/A	52,320	5,350	9,840	11,430	2,770	8'-6"	14'-3"	7'-5"	13'-9"	6"	8"
15227	227	15	N/A	59,380	5,410	10,100	11,490	2,780	8'-6"	14'-3"	7'-5"	13'-9"	6"	8"
15250	250	20	N/A	65,400	5,430	10,280	11,510	2,800	8'-6"	14'-3"	7'-5"	13'-9"	6"	8"
15214	214	10	N/A	56,610	5,640	10,440	12,450	2,920	8'-6"	15'-7"	8'-9"	15'-1"	6"	8"
15245	245	15	N/A	64,810	5,700	10,730	12,510	2,920	8'-6"	15'-7"	8'-9"	15'-1"	6"	8"
15270	270	20	N/A	71,420	5,720	10,940	12,530	2,920	8'-6"	15'-7"	8'-9"	15'-1"	6"	8"
15282	282	25	N/A	74,600	5,800	11,120	12,610	2,920	8'-6"	15'-7"	8'-9"	15'-1"	6"	8"
15296	296	15	(2)7.5	77,440	6,750	12,920	15,540	3,540	12'-1"	14'-3"	7'-5"	13'-9"	8"	8"
15325	325	20	(2)10	85,030	6,800	13,160	15,590	3,590	12'-1"	14'-3"	7'-5"	13'-9"	8"	8"
15350	350	25	(2)15	91,560	6,850	13,380	15,640	3,640	12'-1"	14'-3"	7'-5"	13'-9"	8"	8"
15368	368	30	(2)15	96,280	6,870	13,550	15,660	3,660	12'-1"	14'-3"	7'-5"	13'-9"	8"	8"
15310	310	15	(2)7.5	82,000	7,070	13,640	17,050	3,540	12'-1"	15'-7"	8'-9"	15'-1"	8"	8"
15340	340	20	(2)10	89,940	7,120	13,920	17,100	3,590	12'-1"	15'-7"	8'-9"	15'-1"	8"	8"
15365	365	25	(2)15	96,550	7,170	14,170	17,150	3,640	12'-1"	15'-7"	8'-9"	15'-1"	8"	8"
15385	387	30	(2)15	101,840	7,200	14,360	17,180	3,670	12'-1"	15'-7"	8'-9"	15'-1"	8"	8"
15425	428	40	(2)20	112,430	7,470	14,900	17,450	3,940	12'-1"	15'-7"	8'-9"	15'-1"	8"	8"

- Notes:
1. A nominal ton is defined as 3 GPM of water cooled from 95°F to 85°F with a 78°F entering wet bulb.
 2. Operating weight is for tower with water level in the cold water basin at overflow. If a lower operating weight is needed to meet design requirements, your local BAC sales representative can provide additional assistance.
 3. The actual size of the inlet and outlet connection may vary with the design flow rate. Consult unit print for dimensions.

Multi-Cell Units



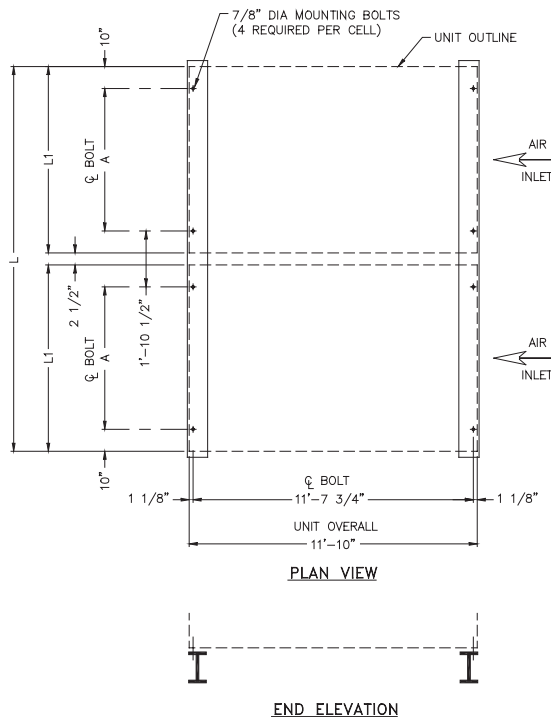
Model Number	NOM Tons ¹	STD Motor Option	Dual Motor Option	CFM	Weight (LBS.)				Dimensions					Inlet ³ Conn.	Outlet ³ Conn.
					Shipping	Nominal Oper ²	Max Oper ²	Heaviest Section ⁵	L	H	A	C	D		
15146-2	292	(2)7.5	N/A	80,640	7,880	14,900	15,840	3,940	17'-2"	10'-3"	N/A	9'-9"	4'-3"	(2)6"	(2)8"
15160-2	320	(2)10	N/A	88,380	7,920	15,080	15,880	3,960	17'-2"	10'-3"	N/A	9'-9"	4'-3"	(2)6"	(2)8"
15176-2	352	(2)15	N/A	96,320	8,020	15,280	15,980	4,010	17'-2"	10'-3"	N/A	9'-9"	4'-3"	(2)6"	(2)8"
15162-2	324	(2)7.5	N/A	86,160	8,400	15,980	17,220	4,200	17'-2"	11'-7"	N/A	11'-1"	4'-3"	(2)6"	(2)8"
15177-2	354	(2)10	N/A	94,140	8,440	16,200	17,260	4,220	17'-2"	11'-7"	N/A	11'-1"	4'-3"	(2)6"	(2)8"
15201-2	402	(2)15	N/A	106,900	8,560	16,580	17,380	4,280	17'-2"	11'-7"	N/A	11'-1"	4'-3"	(2)6"	(2)8"
15219-2	438	(2)20	N/A	116,480	8,600	16,720	17,420	4,300	17'-2"	11'-7"	N/A	11'-1"	4'-3"	(2)6"	(2)8"
15200-2	400	(2)10	N/A	104,640	10,700	19,680	22,860	2,770	17'-2"	14'-3"	7'-5"	13'-9"	4'-3"	(2)6"	(2)8"
15227-2	454	(2)15	N/A	118,760	10,820	20,200	22,980	2,780	17'-2"	14'-3"	7'-5"	13'-9"	4'-3"	(2)6"	(2)8"
15250-2	500	(2)20	N/A	130,800	10,860	20,560	23,020	2,800	17'-2"	14'-3"	7'-5"	13'-9"	4'-3"	(2)6"	(2)8"
15214-2	428	(2)10	N/A	113,220	11,280	20,880	24,900	2,920	17'-2"	15'-7"	8'-9"	15'-1"	4'-3"	(2)6"	(2)8"
15245-2	490	(2)15	N/A	129,620	11,400	21,460	25,020	2,920	17'-2"	15'-7"	8'-9"	15'-1"	4'-3"	(2)6"	(2)8"
15270-2	540	(2)20	N/A	142,840	11,440	21,880	25,060	2,920	17'-2"	15'-7"	8'-9"	15'-1"	4'-3"	(2)6"	(2)8"
15282-2	564	(2)25	N/A	149,200	11,600	22,240	25,220	2,920	17'-2"	15'-7"	8'-9"	15'-1"	4'-3"	(2)6"	(2)8"
15296-2	592	(2)15	(4)7.5	154,880	13,500	25,840	31,080	3,540	24'-5"	14'-3"	7'-5"	13'-9"	6'-5/8"	(2)8"	(2)8"
15325-2	650	(2)20	(4)10	170,060	13,600	26,320	31,180	3,590	24'-5"	14'-3"	7'-5"	13'-9"	6'-5/8"	(2)8"	(2)8"
15350-2	700	(2)25	(4)15	183,120	13,700	26,760	31,280	3,640	24'-5"	14'-3"	7'-5"	13'-9"	6'-5/8"	(2)8"	(2)8"
15368-2	736	(2)30	(4)15	192,560	13,740	27,100	31,320	3,660	24'-5"	14'-3"	7'-5"	13'-9"	6'-5/8"	(2)8"	(2)8"
15310-2	620	(2)15	(4)7.5	164,000	14,140	27,280	34,100	3,540	24'-5"	15'-7"	8'-9"	15'-1"	6'-5/8"	(2)8"	(2)8"
15340-2	680	(2)20	(4)10	179,880	14,240	27,840	34,200	3,590	24'-5"	15'-7"	8'-9"	15'-1"	6'-5/8"	(2)8"	(2)8"
15365-2	730	(2)25	(4)15	193,100	14,340	28,340	34,300	3,640	24'-5"	15'-7"	8'-9"	15'-1"	6'-5/8"	(2)8"	(2)8"
15385-2	774	(2)30	(4)15	203,680	14,400	28,720	34,360	3,670	24'-5"	15'-7"	8'-9"	15'-1"	6'-5/8"	(2)8"	(2)8"
15425-2	856	(2)40	(4)20	224,860	14,490	29,800	34,900	3,940	24'-5"	15'-7"	8'-9"	15'-1"	6'-5/8"	(2)8"	(2)8"

4. Unless otherwise indicated, all connections 3" and smaller are MPT. Connections 4" and larger are beveled for welding and mechanically grooved.

5. The heaviest section for all models except 15214 through 15282 is the upper section. Models 15146 to 15219 ship in one piece.

Series 1500 Support Details

The recommended support arrangement for the Series 1500 Cooling Tower is parallel I-beams positioned as shown in the following drawing. Besides providing adequate support, the steel also serves to raise the unit above any solid foundation to ensure access to the bottom of the tower.



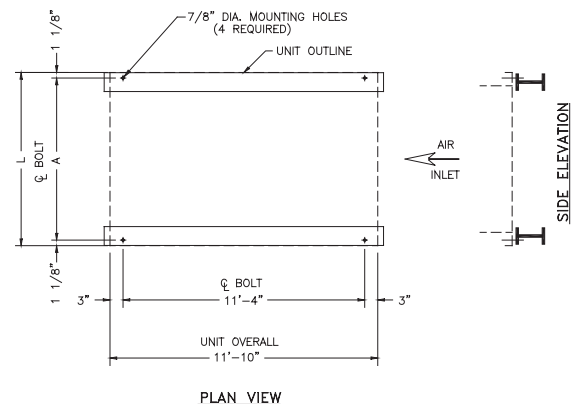
Plan A/C: Single-Cell and Multi-Cell Units

Model Number	A	L ₁	L
15146 to 15282	6' 9-3/4"	8' 5-3/4"	-
15296 to 15425	10' 5-1/4"	12' 1-1/4"	-
15146-2 to 15282-2	6' 9-3/4"	8' 5-3/4"	17' 2"
15296-2 to 15425-2	10' 5-1/4"	12' 1-1/4"	24' 5"

Notes:

1. Support beams and anchor bolts are to be selected and installed by others.
2. All supporting steel must be level at the top.
3. Beams must be selected in accordance with accepted structural practice. Maximum deflection of beam under unit to be 1/360 of span, not to exceed 1/2 inch.
4. All units can be furnished with an optional vibration isolation package, if required, to be installed between the tower and supporting steel. The BAC vibration isolation package is designed for units on support plan A/C. When determining the length of steel beams, allow for the length of vibration isolation rails, as they may be longer than the tower length shown above.
5. If point vibration isolation is used on a multi-cell tower, the isolators MUST be under the supporting steel, NOT between the steel and the cooling tower.

Series 1500 Cooling Towers may also be supported on columns at the anchor bolt locations shown in Plan A or Plan C. To support a Series 1500 Cooling Tower on columns in an alternate steel support arrangement, consult your BAC Representative. A 12"x12" bearing surface must be provided under each of the concentrated load points (See Note 5).



Plan B: Single-Cell Units Only

Model Number	A	L
15146 to 15282	8' 3-1/2"	8' 5-3/4"
15296 to 15425	11' 11"	12' 1-1/4"

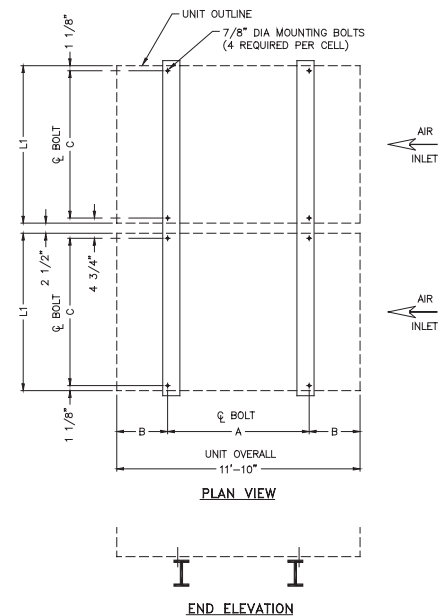
Alternative Steel Support for Replacement Applications

For replacement installations, the Series 1500 Cooling Tower has been designed to match the supporting steel of most existing BAC counterflow and crossflow cooling towers without modifications. The Series 1500 Cooling Tower has also been designed to match competitive units steel support.

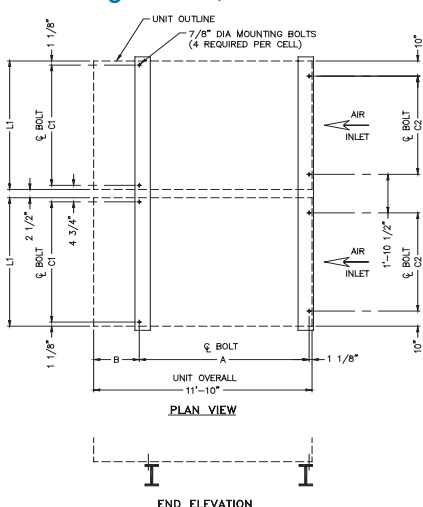
Shown below are the most common steel support arrangements which can be accommodated by the Series 1500 Cooling Tower. If individual point support is required, or if steel arrangement is not as shown below, consult your local BAC Representative for assistance.

Alternative Plan A: Typical dimensions for Single-Cell, Two-Cell Units

Model Number	Unit Replaced	A	B	C	L ₁
15146 to 15282	VLT/VST	8' 9-1/8"	1' 6-7/16"	8' 3-1/2"	8' 5-3/4"
15296 to 15425	VLT/VST/VXT	8' 11-1/4"	1' 5-3/8"	11' 11"	12' 1-1/4"
	VXT/VXMT	9' 7-1/2"	1' 1-1/4"	11' 11"	12' 1-1/4"
15146 to 15282	CFT	8' 0"	1' 11"	8' 3-1/2"	8' 5-3/4"
	Series 3000	8' 3-1/4"	1' 9-3/8"	8' 3-1/2"	8' 5-3/4"
15296 to 15425	CFT	8' 0"	1' 11"	11' 11"	12' 1-1/4"
	Series 3000	9' 6"	1' 2"	11' 11"	12' 1-1/4"



Cantilevered Plan: Typical dimensions for Single-Cell, Two-Cell Units



Model Number	Unit Replaced	A	B	C ₁	C ₂	L ₁
15146 to 15282	VLT/VST	8' 9-1/8"	2' 11-3/4"	8' 3-1/2"	6' 9-3/4"	8' 5-3/4"
15296 to 15425	VLT/VST/VXT	8' 11-1/4"	2' 9-5/8"	11' 11"	10' 5-1/4"	12' 1-1/4"
	VXT/VXMT	9' 7-1/2"	2' 1-3/8"	11' 11"	10' 5-1/4"	12' 1-1/4"
15146 to 15282	CFT	8' 0"	3' 8-7/8"	8' 3-1/2"	6' 9-3/4"	8' 5-3/4"
	Series 3000	8' 3-1/4"	3' 5-5/8"	8' 3-1/2"	6' 9-3/4"	8' 5-3/4"
15296 to 15425	CFT	8' 0"	3' 8-7/8"	11' 11"	10' 5-1/4"	12' 1-1/4"
	Series 3000	9' 6"	2' 2-7/8"	11' 11"	10' 5-1/4"	12' 1-1/4"

- If existing vibration isolator rails are being re-used on a replacement project, springs/elastomers must be re-sized to match the new cooling tower weight distribution. Consult your local BAC Representative for details.
- When using Alternative Plan A support arrangements with optional bottom water outlet, size and location restrictions will apply to water outlet piping. Consider the Cantilevered Plan support arrangement or consult your local BAC Representative for details.

Engineering Considerations

1. Location

Series 1500 Cooling Towers must have an adequate supply of fresh air to the air inlet. When units are located adjacent to building walls or in enclosures, care must be taken to ensure that the warm, saturated discharge air is not deflected and drawn back to the air inlet.

CAUTION: Each cooling tower should be located and positioned to prevent the introduction of the warm discharge air and the associated drift, which may contain chemical or biological contaminants, including Legionella, into the ventilation systems of the building on which the tower is located or those of adjacent buildings.

For detailed recommendations on Series 1500 Cooling Tower layout, refer to the BAC Selection Software, on our web site, www.BaltimoreAircoil.com, or consult your local BAC Representative.

2. Piping and Valves

Piping must be sized and installed in accordance with good piping practice. To prevent basin overflow at shutdown and to ensure satisfactory pump operation at start-up, all heat exchangers and as much piping as possible should be installed below the operating level of the cooling tower. All piping should be supported by pipe hangers or other supports, not by the cooling tower.

Series 1500 Cooling Towers are furnished with a single water inlet connection per cell that will deliver water to the distribution system. On multi-cell installations, Series 1500 Cooling Towers may require flow balancing valves (supplied by others) at the inlets to the hot water basins to balance the flow to individual tower cells. External shutoff valves (supplied by others) may also be required if the system design necessitates the isolation of individual tower cells.

When multiple tower cells are used on a common system, equalizing lines should be installed between the cold water basins to ensure balanced water level in all cells.

3. Capacity Control

Fan cycling is the simplest method of capacity control for Series 1500 Cooling Towers. The number of steps of capacity control can be increased using the ENERGY-MISER® Fan System, the independent fan motor option, or two-speed fan motors in conjunction with fan cycling. These options also provide substantial energy savings when compared to simple fan cycling.

WARNING: Rapid on-off cycling can cause the fan motor to overheat. It is recommended that controls be set to allow a maximum of 6 on-off cycles per hour.

4. Variable Frequency Drives (VFD)

Installations which are to be controlled by Variable Frequency Drives (VFD) require the use of an inverter duty motor as designed per NEMA Standard MG.1, Section IV, Part 31, which recognizes the increased stresses placed on motors by these drive systems. Inverter duty motors must be furnished on VFD applications in order to maintain the motor warranty.

WARNING: When the fan speed of a Series 1500 Cooling Tower is to be changed from the factory-set speed, including the use of a variable speed control device, steps must be taken to avoid operating at or near the fan's "critical speed". Consult with your local BAC Representative on any application using variable speed control to determine whether any critical speeds may be encountered and if any motor modifications may be required.

5. System Resonance Frequencies

Units installed on vibration isolation equipment may exhibit unique system resonance frequencies which cannot be anticipated but may create operational problems for the unit. For this reason, a vibration cutout switch is recommended.



6. Water Treatment

As water evaporates in a cooling tower, the dissolved solids originally present in the water remain in the system. The concentration of these dissolved solids increases rapidly and can cause scale and corrosion. In addition, airborne impurities and biological contaminants, including Legionella, may be introduced into the circulating water. To control all potential contaminants, a water treatment program must be employed. In many cases, a simple bleed-off may be adequate for control of scale and corrosion. However, biological contamination, including Legionella, can be controlled only through the use of biocides. Such treatment should be initiated at system startup, after periods of equipment shutdown, and continued regularly thereafter. Accordingly, it is strongly recommended a biocide be initiated when the cooling tower system is first filled with water and continued regularly thereafter. For more information, consult the BAC Series 1500 Operating and Maintenance Manual.

When a water treatment program is employed, it must be compatible with construction materials. The pH of the circulating water must be maintained between 6.5 and 9.0. Units having galvanized steel construction and a circulating water pH of 8.3 or higher will require periodic passivation of the galvanized steel to prevent the accumulation of white, waxy, non-protective zinc corrosion called white rust. Batch feeding of chemicals into the unit is not recommended. If units are constructed with the optional corrosion resistant materials, acid treatment may be considered; however, the water quality must be maintained within the guidelines set forth in the Operating and Maintenance Instructions.

For specific recommendations on water treatment, contact a competent water treatment supplier.

7. Wet Deck Surface Compatibility

BACross® Wet Deck Surface, standard in all Series 1500 Cooling Towers, is constructed of polyvinyl chloride (PVC) and has a flame spread rating of 5 per ASTM Standard E84. The maximum allowable water temperature for a Series 1500 Cooling Tower with PVC wet deck surface is 120°F.

The PVC wet deck surface is compatible with the water found in most cooling tower applications. For applications where the entering water temperature exceeds 120°F, the optional, high temperature wet deck must be used. The optional wet deck material allows entering water temperatures up to 135°F. For the proper choice of wet deck surface contact your BAC Representative.

8. Sound Levels

Sound rating data, which can be used to calculate sound levels generated by the cooling tower, are available for all Series 1500 Cooling Towers. When making such calculations, the designer must take into account the effects of the geometry of the tower installation as well as the distance and direction from the tower to noise-sensitive areas.

Several optional methods can be utilized in order to meet a specific sound code or specification. The ENERGY-MISER® Fan System, two-speed motors, or variable frequency drives can be used to reduce sound during periods of non-peak thermal loads. Other methods include low-sound fans and intake and discharge sound attenuation to provide acceptable sound characteristics. For detailed low sound selections, please consult your local BAC Representative.

9. Protection Against Basin Water Freezing

When the tower is shut down in freezing weather, the basin water must be protected further by draining to an indoor auxiliary remote sump tank (available from BAC) or by providing supplementary heat to the basin water by means of electric immersion heaters or steam coils. All exposed water piping and make-up lines that do not drain at shutdown should be traced with electric heater tape and insulated.

Engineering Specifications

1.0 Cooling Tower

1.1 General: Furnish and install _____ factory-assembled, induced draft, crossflow cooling tower(s) with vertical air discharge conforming in all aspects to the specifications, schedules and as shown on the plans. Overall dimensions shall not exceed approximately _____ ft.(mm) long x _____ ft.(mm) wide x _____ ft.(mm) high. The total connected fan horsepower shall not exceed _____ HP(kW). The cooling tower(s) shall be Baltimore Aircoil Model _____.

1.2 Thermal Capacity: The cooling tower(s) shall be guaranteed by the manufacturer to cool _____ USGPM(L/S) of water from _____ °F(°C) to _____ °F(°C) at _____ °F(°C) entering wet bulb temperature. Additionally, the thermal performance shall be certified by the Cooling Technology Institute in accordance with CTI Certification Standard STD-201. Lacking such certification, a field acceptance test shall be conducted within the warranty period in accordance with CTI Acceptance Test Code ATC-105, by the Cooling Technology Institute or other qualified independent third party testing agency. Manufacturers performance guarantees or performance bonds without CTI Certification or independent field thermal performance test shall not be accepted. The cooling tower shall comply with the energy efficiency requirements of ASHRAE Standard 90.1.

1.3 Corrosion Resistant Construction (standard): Unless otherwise noted in this specification, all steel panels and structural members shall be constructed of heavy-gauge G-235 (Z700 metric) galvanized steel with all edges given a protective coating of zinc-rich compound.

(alternate 1.3) Corrosion Resistant Construction (optional): Unless otherwise noted in this specification, all steel panels and structural members must be constructed with the BALTIMORE® Corrosion Protection System. The system shall consist of G-235 (Z700 metric) hot-dip galvanized steel prepared in a four-step (clean, pretreat, rinse, dry) process with an electrostatically sprayed, thermosetting hybrid polymer fuse-bonded to the substrate during a thermally activated curing stage and monitored by a 23-step quality assurance program.

(alternate 1.3) Type 304 Stainless Steel Construction (optional): All steel panels and structural members, including the casing panels, hot and cold water basins, distribution covers, fan deck and fan cylinder shall be constructed of Type 304 stainless steel and assembled with Type 304 stainless steel nut and bolt fasteners. All factory seams in the cold water basin shall be welded to ensure watertight assembly and shall be unconditionally warranted against leaks for five (5) years from date of shipment.

1.4 Quality Assurance: The cooling tower manufacturer shall have a Management System certified by an accredited registrar as complying with the requirements of ISO-9001 to ensure consistent quality of products and services.

Cooling tower manufacturers that are not ISO-9001 certified shall provide an additional one year of warranty to the customer at no additional cost.

2.0 Construction Details

2.1 Cold Water Basin: The cold water basin shall be constructed of heavy-gauge steel panels and structural members. The basin shall include a depressed section with drain/clean-out connection. The basin area under the wet deck surface shall be sloped toward the depressed section to facilitate cleaning. Standard basin accessories shall include a brass make-up valve with a large diameter plastic float for easy adjustment of operating water level.

(alternate 2.1) Cold Water Basin: The cold water basin shall be constructed of heavy-gauge Type 304 stainless steel panels and structural members. The basin shall include a depressed section with drain/clean-out connection. The basin area under the wet deck surface shall be sloped toward the depressed section to facilitate cleaning. Standard basin accessories shall include a brass make-up valve with large diameter plastic float for easy adjustment of the operating water level. All factory seams in the cold water basin shall be welded to ensure water-tight assembly and be unconditionally warranted against leaks for five (5) years from date of shipment.

2.2 Water Outlet: The cooling tower basin outlet shall be beveled for welding and grooved for mechanical coupling or a bolt hole circle to accept an ASME Class 150 flat face flange. The outlet shall be provided with large area lift out strainers with perforated openings sized smaller than the water distribution nozzles and an anti-vortexing device to prevent air entrainment. The strainer and vortex device shall be constructed of the same materials as the cold water basin to prevent dissimilar metal corrosion.

2.3 Water Distribution System: The distribution system shall be furnished with a single water inlet. The pipe stub connection is beveled for welding and grooved for mechanical coupling. The hot water distribution basin shall be open gravity type and constructed of heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel. Plastic metering devices shall be provided to ensure the uniform distribution of water over the wet deck surface. Lift-off distribution covers shall be constructed of heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel.

(alternate 2.3) Water Distribution System: The distribution system shall be furnished with a single water inlet. The pipe stub connection is beveled for welding and grooved for mechanical coupling. The hot water distribution basin shall be open gravity type and constructed of heavy-gauge Type 304 stainless steel. Plastic metering devices shall be provided to ensure the uniform distribution of water over the wet deck surface. Lift-off distribution covers shall be constructed of heavy-gauge Type 304 stainless steel.



3.0 Mechanical Equipment

3.1 Fan(s): Fan(s) shall be axial flow with aluminum alloy blades selected to provide optimum cooling tower thermal performance with minimal sound levels. Air shall discharge through a fan cylinder designed for streamlined air entry and minimum tip clearance for maximum fan efficiency. The top of the fan cylinder shall be equipped with a conical, non-sagging removable fan guard.

3.2 Bearings: Fan(s) and shaft(s) shall be supported by heavy duty, self-aligning, grease packed ball bearings with moisture proof seals and integral slinger collars, designed for a minimum L₁₀ life of 40,000 hours (280,000 Hr. Avg. Life).

3.3 Fan Drive: The fan(s) shall be driven by a one-piece, multi-groove, solid back V-type powerband with taper lock sheaves designed for 150% of the motor nameplate horsepower. The powerband shall be constructed of neoprene reinforced polyester cord and be specifically designed for cooling tower service.

3.4 Sheaves: Fan and motor sheave(s) shall be fabricated from corrosion-resistant materials to minimize maintenance and ensure maximum drive and powerband operating life.

3.5 Fan Motor: Fan motor(s) shall be totally-enclosed, air-over (TEAO), reversible, squirrel cage, ball bearing type designed specifically for cooling tower service. The motor shall be furnished with special moisture protection on winding, shafts, and bearings.

(Alternate 3.5) Fan Motor: Fan motor(s) shall be totally-enclosed, air-over (TEAO), reversible, squirrel cage, ball bearing type designed specifically for cooling tower service. The motor shall be furnished with special moisture protection on winding, shafts, and bearings. Fan motors shall be inverter duty type designed per NEMA Standard MG1, Section IV Part 31.

3.6 Mechanical Equipment Warranty: The fan(s), fan shaft(s), bearings, mechanical equipment support, and fan motor shall be warranted against defects in materials and workmanship for a period of five (5) years from date of shipment.

3.7 ENERGY-MISER® Fan System (optional): Two single speed fan motors, one sized for full speed and load, the other sized for 2/3 speed and approximately 1/3 the full load horsepower shall be provided for capacity control and stand-by protection from drive or motor failure. Two-speed motor(s) are not an acceptable alternative.

4.0 Wet Deck Surface and Drift Eliminators

4.1 Wet Deck Surface and Drift Eliminators: The wet deck surface and integral drift eliminators shall be formed from self-extinguishing polyvinyl chloride (PVC) having a flame spread rating of 5 per ASTM E84 and shall be impervious to rot, decay, fungus or biological attack. The wet deck surface shall be manufactured, tested, and rated by the cooling tower manufacturer and shall be elevated above the cold water basin to facilitate cleaning.

5.0 Air Inlet Louvers

5.1 Air Inlet Louvers: Air inlet louvers shall be separate from the wet deck surface and be removable to provide easy access for inspection of the air/water interface at the louver surface. Louvers shall prevent water splash-out during fan cycling and be constructed of maintenance free, corrosion resistant, UV protected, fiberglass reinforced polyester (FRP).

6.0 Access

6.1 Plenum Access: Access door shall be provided on two sides of the tower for access into plenum sections.

7.0 Sound

7.1 Sound Level: To maintain the quality of the local environment, the maximum sound pressure levels (dB) measured 50 ft from the cooling tower operating at full fan speed shall not exceed the sound levels detailed below.

(Alternate) 7.1 Sound Level: To maintain the quality of the local environment, the cooling tower shall be furnished with a low sound fan. The thermal performance of the cooling tower when furnished with the low sound fan shall be certified by the Cooling Technology Institute in accordance with paragraph 1.2 of this specification. Maximum sound pressure levels (dB) measured 50 ft from the cooling tower operating at full fan speed shall not exceed the sound levels detailed below.

Location	63	125	250	500	1000	2000	4000	8000	dB _A
Discharge									
Air Inlet									
Cased Face									
Blank Off									

BAC Certified Quality

CTI Performance Certification

The thermal performance of BAC Series 1500 Cooling Towers has been certified by the Cooling Technology Institute (CTI) in accordance with their standard STD-201. Independent CTI certification assures that the thermal capacities set forth in published literature accurately reflect actual cooling tower performance and eliminates the need for costly individual cooling tower testing.



The Cooling Technology Institute (CTI) is a nonprofit, self-governing, technical association of manufacturers, users, and suppliers of evaporative cooling equipment, and engineering firms having an interest in water conservation. It is dedicated to improving the technology, design, performance, and maintenance of evaporative cooling equipment. As such, CTI offers a thermal performance certification program to all cooling tower manufacturers.

Five-Year Mechanical Equipment Warranty

The five-year warranty provided on BAC Series 1500 Cooling Towers is the most comprehensive fan motor and mechanical equipment warranty available in the industry. Included in the five-year warranty are the mechanical equipment support, fan(s) fan shaft(s), bearings, sheaves, and fan motor(s).



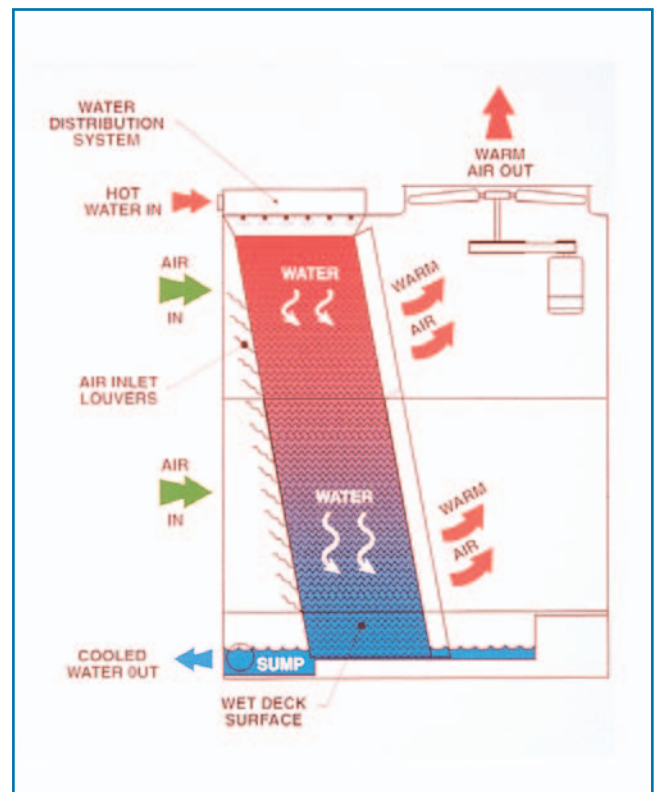
ISO 9001 Certification

ISO 9001 certification guarantees the consistently high quality of Series 1500 Cooling Towers. It confirms BAC's commitment to quality assurance and reaffirms that BAC meets international standards set for management principles, designs, closed-loop corrective action, training and documentation control in all of its engineering and manufacturing operations.



Principle of Operation

Water from the heat source enters the Series 1500 Cooling Tower through a single inlet connection located on the louver face of the unit. The water flows into the hot water basin, where non-clog diffuser nozzles distribute the water uniformly over the wet deck surface. Simultaneously, air is drawn through air inlet louvers and across the wet deck surface, causing a small portion of the water to evaporate. Evaporation removes the heat from the remaining water. The cooled water then flows into the cold water basin and returns to the heat source.



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