

Baltimore Aircoil Company

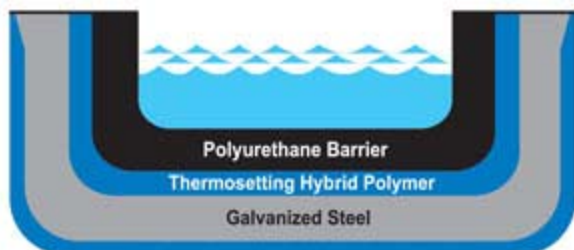
Custom Features & Options

Series 3000

[Materials of Construction \(/english/resource-library/file/226\)](/english/resource-library/file/226)

Standard Construction — G-235 mill galvanized steel is the heaviest commercially available galvanized steel, universally recognized for its strength and corrosion resistance. To assure long-life, a G-235 mill galvanized steel frame with fiberglass reinforced polyester (FRP) casing panels and louvers is used as the standard material of construction. The structural integrity of the unit is provided by its strong steel frame. Series 3000 standard construction has been seismically verified by shake table testing in an independent laboratory up to an S_{DS} of 1.40g and can withstand wind loads of up to 60 psf, proving its frame construction is designed for extreme durability. With proper maintenance and water treatment, G-235 galvanized steel and FRP will provide an excellent service life under the operating conditions normally encountered in comfort cooling and industrial applications.

TriArmor® Corrosion Protection System (<http://www.baltimoreaircoil.com/english/resource-library/file/227>) (Option) — The TriArmor® Corrosion Protection System consists of heavy gauge G-235 galvanized steel panels fully encapsulated by a thermosetting hybrid polymer and further protected by a polyurethane barrier applied to all submerged surfaces of the cold water basin. The triple layers of protection form a completely seamless cold water basin for the most leak resistant and durable basin in the industry. Other components, such as the strainer, within the basin will be constructed of Type 304 Stainless Steel. The TriArmor® Corrosion Protection System was specifically designed for evaporative cooling applications and released in 2006 after a decade of extensive R&D and field testing. To date, there are over 1,000 successful installations in North America. Every basin is leak tested at the factory and warranted against leaks and corrosion for 5 years.



TriArmor® Corrosion Protection System Triple Layer Protection of the Cold Water Basin

(</english/resource-library/file/642>) EVERTOUGH™ Construction (Option) — EVERTOUGH™ Construction combines the most corrosion resistant materials to provide the best value in corrosion protection. Specifically, a combination of the TriArmor® Corrosion Protection System, thermosetting hybrid polymer, and fiberglass reinforced polyester (FRP) casing panels and louvers are used. EVERTOUGH™ Construction units also include pultruded fiberglass reinforced polyester hot water basins, making up the most corrosion resistant construction available on the market. EVERTOUGH™ Construction is backed by a comprehensive Louver-to-LouverSM 5-year warranty, which covers ALL components from the fan to the cold water basin, from louver to louver, including the motor. A 5-year leak and corrosion warranty for the basin is also provided with the TriArmor® Corrosion Protection System.

Thermosetting Hybrid Polymer (Option) — A thermosetting hybrid polymer, used to extend equipment life, is applied to select G-235 hot-dip galvanized steel components of the unit. The polymerized coating is baked onto the G-235 hot-dip galvanized steel and creates a barrier to the already corrosion resistant galvanized steel. The thermosetting hybrid polymer has been tested to withstand 6,000 hours in a 5% salt spray without blistering, chipping, or losing adhesion.

Stainless Steel (Option) — Several Type 304 stainless steel material of construction options are available.

Welded Type 304 Stainless Steel Cold Water Basin — A Type 304 welded stainless steel cold water basin is available. All steel panels and structural members of the cold water basin are constructed from Type 304 stainless steel. Seams between panels inside the cold water basin are welded, providing an advantage over bolted stainless steel cold water basins for minimizing susceptibility to leaks at basin seams. The basin is leak tested at the factory and welded seams are provided with a 5-year, leak-proof warranty.

Stainless Steel Hot Water Basin — The hot water basin and basin covers are constructed of Type 304 stainless steel.

JE PREMIER SERIES® — All unit structural elements and the hot and cold water basins are constructed of Type 304 stainless steel. Seams between panels inside the cold water basin are welded, providing an extreme advantage over bolted cold water basins for minimizing susceptibility to leaks at basin seams. The basin is leak tested at the factory and welded seams are provided with a 5-year leak-proof warranty. Casing panels and air intake louvers are constructed of corrosion and UV-resistant fiberglass reinforced polyester (FRP). Each cooling tower provided with the JE PREMIER SERIES® Construction is backed by a comprehensive Louver-to-LouverSM 5-year warranty, which covers ALL components from the fan to the cold water basin, from louver to louver, including the motor.

Basinless Unit Construction (Option) — The basinless unit construction option enables Series 3000 Cooling Towers to be directly installed on new or existing cold water basins. This custom feature reduces maintenance costs by eliminating the integral basin from traditional units. It simplifies piping and pumping requirements of multi-cell installations, eliminates concern for basin corrosion, and provides a cost-effective solution for many field-erected replacement projects. BAC is the only leading evaporative cooling equipment manufacturer to provide basinless construction for factory assembled equipment.

Seismic/Wind Upgraded Structure (<http://www.baltimoreaircoil.com/english/resource-library/file/371>) (Option) — Select steel panels and structural members are upgraded for higher seismic and wind load applications. An upgraded Series 3000 is certified to withstand up to an S_{DS} of 3.10g and wind loads of 82 psf. All BAC upgraded units are shake table tested by an independent laboratory to certify the most accurate seismic ratings ensuring that the unit will remain operable following a seismic event.

Standard Fiberglass Reinforced Polyester (FRP) Casing Panels — Used with BAC's durable frame construction, FRP casing panels offer a more durable corrosion resistant unit. FRP casing panels are a key component due to their corrosion resistant properties.

Steel Casing Panels and Louvers (Option) — Steel casing panels and louvers are available in G-235 hot-dip galvanized steel, thermosetting hybrid polymer, and stainless steel.

Drive System Options

Standard BALTIDRIVE® Power Train (<http://www.baltimoreaircoil.com/english/resource-library/file/1713>) — 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. This BAC engineered drive system consists of a specially designed powerband and two cast aluminum sheaves located at minimal shaft centerline distances to maximize belt life. As compared to a gear drive system, this specially engineered belt drive system provides many advantages. The BALTIDRIVE® Power Train requires only periodic inspection of components and belt tensioning, which is simple with a single nut adjustment, and requires less downtime. Only fan bearing lubrication is required for routine maintenance. Belt drive systems also have the added advantage of being suitable for variable frequency drive (VFD) applications without requiring expensive optional accessories.

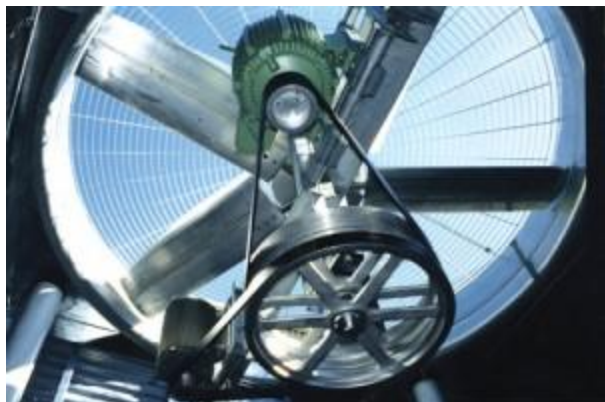


BALTIDRIVE® Power Train Fan System

BALTIGUARD™ Fan System (Option) — The BALTIGUARD™ Fan System consists of two standard single-speed fan motor and drive assemblies. One drive assembly is sized for full speed and load, and the other is sized approximately 2/3 speed and consumes only 1/3 the design horsepower. This configuration provides the reserve capability of a standby motor in the event of failure. As a minimum, approximately 70% capacity will be available from the low horsepower motor, even on a design wet-bulb day. Controls and wiring are the same as those required for a two-speed, two-winding motor. Redundant

motors are available by increasing the size of the standby fan motor of the BALTIGUARD™ Fan System to the size of the main motor. This provides 100% motor redundancy and the greatest level of reliability.

BALTIGUARD PLUS™ Fan System (Option) —The BALTIGUARD PLUS™ Fan System builds on the advantages of the BALTIGUARD™ Fan System by adding a variable frequency drive (VFD) to either the pony or the main motor, depending on system requirements. This offers the benefits of additional capacity control and energy savings, along with the redundancy offered by the BALTIGUARD™ Fan System. Alternatively, a VFD can be added to both the pony and main motor for complete capacity control and redundancy under any load.



BALTIGUARD PLUS™ Fan System Used for VFD Applications

ENDURADRIVE™ Fan System ([/english/resource-library/file/2817](http://www.baltimoreaircoil.com/english/resource-library/file/2817)) (Option, Standard on S3E1424-14U and S3E-1424-14W) — The ENDURADRIVE™ Fan System offers an energy efficient direct drive motor for large cooling tower applications. This system is designed to replace conventional mechanical gear speed reduction designs and provides additional energy savings with the lowest maintenance, and highest reliability.

Note: The ENDURADRIVE™ Fan System is also available as a [retrofit kit \(<http://www.baltimoreaircoil.com/english/resource-library/file/3158>\)](http://www.baltimoreaircoil.com/english/resource-library/file/3158) for current and previous generation Series 3000 Cooling Towers.



ENDURADRIVE™ Fan System

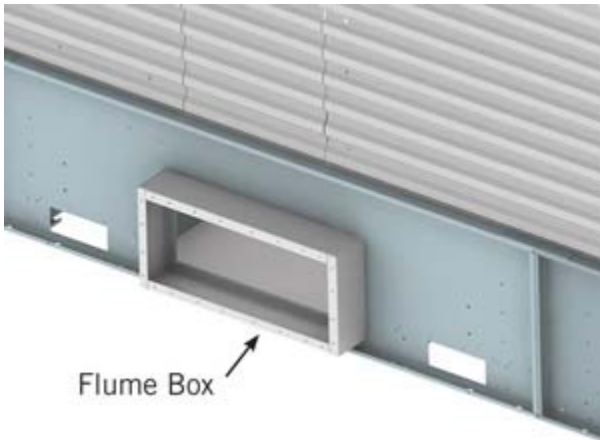
Gear Drive System, Close-Coupled Motor (Option, Standard on S3E-1222-14T, S3E-1424-12T, S3E-1424-13T, and S3E-1424-14T) — A gear drive system is available as a fan drive option on the Series 3000. Both the gear drive and couplings are

selected with a 2.0 service factor. Gear construction includes a nickel-alloy steel shaft, casehardened gears, self lubrication, and a single piece, gray iron housing. This drive system ships completely installed and aligned.

Gear Drive System, Externally Mounted Motor (Option) — A gear drive system with a TEFC motor mounted outside the airstream is also available on the Series 3000. A non-corrosive carbon-fiber composite drive shaft with stainless steel hubs is selected with a 2.0 service factor. The motor and drive shaft ship separately for easy field installation.

Multi-Cell Unit Options

Flume Box – Standard on all Multi-Cell Units — A flume box is provided as standard for multi-cell units to balance the water level in the cold water basins. See the [Connection Guide \(/english/resource-library/file/359\)](http://www.baltimoreaircoil.com/english/resource-library/file/359) for more information.



Flume Box

Equalizer (Option) — Equalizer connections are available as an option for multi-cell cooling towers in lieu of a flume box. Use of an equalizer allows for easy isolation of a cell for winter operation, maintenance, or inspection while continuing system operation. See [Cooling Towers in Parallel \(http://www.baltimoreaircoil.com/english/resource-library/file/233\)](http://www.baltimoreaircoil.com/english/resource-library/file/233) for more information.

Water Distribution System

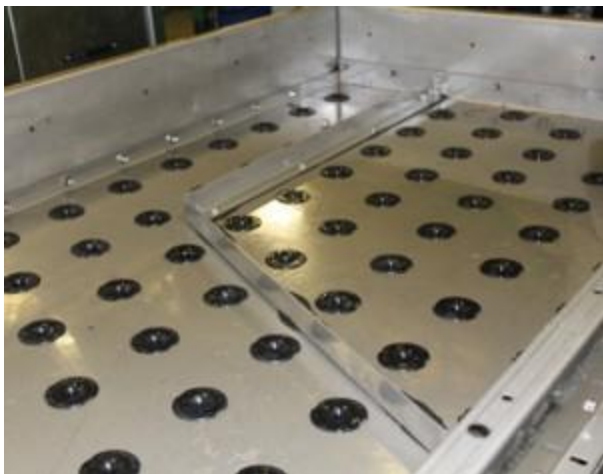
Standard Top Inlet Connections – The Series 3000 comes standard with top inlet connections to each of the hot water basins. Hot water basin covers matching the unit material of construction come in easy to handle sections for easy access and inspection of the distribution system. The use of gravity distribution minimizes pump head requirements and allows for maintenance during unit operation. BAC's patented non-clog nozzles ensure even flow over the fill area and are simple to remove for maintenance.

EASY CONNECT® Piping Arrangement (Option) — The EASY CONNECT® Piping Arrangement simplifies water inlet piping on the Series 3000 by automatically balancing the flow within each cell, eliminating the need for flow balancing valves. A single water inlet connection, located on the side or bottom of each unit, eliminates the need for overhead piping and piping supports. It reduces installation costs and reduces potential for errors during field piping fabrication.



EASY CONNECT® Piping Arrangement

Standard Weir Dams —Reducing water flow through a unit below the recommended level may potentially create uneven water distribution through the heat transfer section, causing scale build up, splash out/drift, and icing. To successfully modulate the water flow while avoiding potential complications, weir dams may be installed in the hot water basin. With a weir dam, the hot water basin can accommodate a flow range of 50% to 100% of the design flow.



Weir Dams

Fill

Standard Fill — Standard fill can be used in applications with entering water temperature up to 130°F (54.4°C). The fill and drift eliminators are formed from self-extinguishing PVC having a flame spread rating of 5 per ASTM E84.

High Temperature Fill (Option) — An optional high temperature fill material is available which increases the maximum allowable entering water temperature to 140°F (60°C).

Capacity Enhancement

The need to enhance the capacity of a unit may be necessary when layout is restricted or if capacity requirements have increased and exceed an existing unit's capabilities. By enhancing the capacity of a unit, it may be possible to use a smaller foot print while still meeting thermal requirements of the installation.

Velocity Recovery (VR) Stacks (Option) —A VR stack is a conical fan cowl extension that reduces the discharge pressure the fan has to work against, allowing the fan to move more air for the same energy input. By moving more air through the same unit, the cooling capacity is increased without increasing horsepower or footprint. Effectively, the amount of energy required for each ton of cooling capacity is reduced. VR stacks are CTI certified and can be configured during initial unit purchase to reduce energy requirements or through the aftermarket to increase capacity.



Velocity Recovery Stacks

Shipping and Rigging

Standard Rigging Guides — Rigging guides allow for the upper and lower section of units with a two piece rig to align and engage. The guides ensure proper placement of the top section for multi-cell installations, making rigging much simpler and reducing the time required. This is especially critical during multi-cell installations when units are rigged side-by-side.

Knockdown Units (Option) — Knockdown units are available for jobs where access to the cooling tower location is limited by elevators, doorways, or similar obstacles, where lifting methods impose very strict weight limits, or where the shipping cost of a fully assembled tower is excessive. All materials of construction and design features are the same as those of a factory assembled unit. Welded Type 304 stainless steel cold water basins and TriArmor® Corrosion Protection System cold water basins are excluded due to the need for in-plant assembly.

Air Intake

Standard Louvers — Air intake louvers matching the material of construction of the unit casing panels are standard. Scale formation and icing on the louvers and fill sheets can damage the fill and reduce thermal performance. The Series 3000 louvers are specially designed with greater spacing between louvers (12") and are completely separate from the fill section. This reduces scale and ice accumulation and allows for unobstructed air flow through the unit.

Combined Inlet Shields (CIS) (Option) — The Combined Inlet Shields' (CIS) bent flow path blocks sunlight from the cold water basin and fill section and acts as a screen to prevent debris from entering the unit. These benefits result in a significant reduction in algae growth, debris accumulation, and scale build-up. CIS are constructed from corrosion and UV resistant PVC, are CTI certified, and are installed in easy to handle sections that are separate from the fill section to facilitate removal, inspection, and replacement. The use of CIS results in lower maintenance costs and ease of maintenance over the life of the unit.

Air Intake Screens (Option) — 1" x 1" wire mesh screens are available factory-installed over the air intake louvers to prevent debris from entering the tower and are CTI certified.

Sound Options

Standard Fan — The fan provided for all Series 3000 Cooling Towers is selected to optimize low sound levels and maximize thermal performance.

Low Sound Fan (Option) — The Low Sound Fan option reduces sound up to 9 dBA. Adding a high solidity fan decreases fan speeds, which proportionally decreases sound levels. The thermal performance with the Low Sound Fan has been certified in accordance with CTI Standard STD-201.

Whisper Quiet Fan (Option) — For the most extreme sound limitations, BAC's Whisper Quiet Fan is CTI-certified and reduces sound up to 19 dBA. The axial fan blades are constructed of high grade marine alloy aluminum for light weight construction and corrosion resistance. These heavy duty aluminum fans require minimal maintenance, making them well suited for use in cooling tower applications that benefit from extremely low sound operation.

Sound Attenuation (Option) — Factory designed, tested, and rated sound attenuation options are available for both the air intake and discharge. Consult your local BAC Representative regarding available options.

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