COOLING TOWERS, System Components

When natural draft or induced draft cooling towers of the crossflow or counterflow type are used as the cooling cycle equipment in power generating or industrial plants, or for air conditioning applications, various components are required relative to these towers. It is important that these units and their components do not create a fire hazard, especially during periods when the normal water flow in the towers is not in operation. The units or components listed have been evaluated and found to be of low fire hazard not requiring automatic sprinkler protection of themselves when used for their intended purpose.

These products have been examined from a fire standpoint only, and have not been evaluated for quantity or toxicity of products of combustion. If the cooling tower is located in the vicinity of an occupancy susceptible to smoke damage, additional precautions may need to be taken. Consult appropriate FM Global Property Loss Prevention Data Sheets.

Closed Circuit Cooling Tower Materials

The following materials are FM Approved only when installed in the combinations shown, unless otherwise noted. These products are intended for use in processing noncombustible liquids and nonflammable gases only. Consult appropriate FM Global Property Loss Prevention Data Sheets.

Baltimore Aircoil Co Inc, Box 7322, Baltimore MD 21227

FXV Closed Circuit Cooling Towers available in with crossflow plan areas ranging from 6 × 8.5 ft (1.8 × 2.6 m) to 18 × 12 ft (5.5 × 3.7 m).
FXV3 Closed Circuit Cooling Towers available in with crossflow plan areas ranging from 12 × 24 ft (3.7 × 7.3 m) to 14 × 26 ft (4.25 × 8.0 m).
CXV Evaporative Condensers available in with crossflow plan areas ranging from 6 × 8.5 ft (1.8 × 2.6 m) to 18 × 12 ft (5.5 × 3.7 m).
CXV3 Evaporative Condensers available in with crossflow plan areas ranging from 12 × 24 ft (3.7 × 7.3 m) to 14 × 26 ft (4.25 × 8.0 m).
The above are fabricated with the following components:
- Structure: galvanized or stainless steel walls, support columns fan/roof deck.
- Collection Basin: galvanized or stainless steel.
- Tube Bundles: steel or copper.
- Fill Material: BACross Wet Deck Surface PVC fill, 13 mil [0.013 in. (0.33 mm)] thick before forming by maximum 52.68 in. (1338 mm) deep with the maximum length of 120 in. (3048 mm). The leading edge of the fill pack is a minimum of 3.5 in. (90 mm) from the front exterior face of the upper tower cell and a minimum of 7.75 in. (196 mm) for the lower cell.
- Drift Eliminators: PVC Fill Packs.
- Water Distribution System: galvanized or stainless steel header with PVC branches. PVC internal and external pump piping and upper spray distribution piping.
- Fan: multiple heavy duty aluminum blades mounted to an aluminum or steel hub.

SPX Cooling Technologies Inc, 7401 W 129th St, Overland Park KS 66213

Industrial Process Cooler. Available with parallel flow plan areas ranging from 10×20 ft (3×6 m) to 50×100 ft (15×30 m) and counterflow plan areas ranging from 12×12 ft (3.7×3.7 m) to 50×50 ft (15×15 m).

Industrial Process Coolers are fabricated with the following components:
- FRP Structure: Consists of FRP wall panels, exterior support columns, fan/roof deck and fan shroud.
- Collecting Basin: Concrete.
- Tube Bundles: HDG steel, stainless steel, copper or metals.
- Drift Eliminators: Stainless steel, HDG steel.
- Water Distribution System: Fire retardant treated Schedule 40 FRP pipe, ABS nozzles.
- Fan: Fire retardant treated fiberglass reinforced epoxy or aluminum.

Multi-Cell Cooling Towers

The following water cooling towers are FM Approved only when installed in multi-cell (two or more cells) fashion in the combinations shown. The exact number of cells chosen is determined by the application and its anticipated seasonal operating strategy which includes consideration of cell outage due to fire damage, mechanical failure and preventive maintenance such that sufficient cooling capacity is available to enable normal business and manufacturing operations to continue throughout the year.

Baltimore Aircoil Co Inc, Box 7322, Baltimore MD 21227

Series 1500, 1500A, 3000A are induced draft, crossflow, cooling towers. The units are constructed with individual cell sizes ranging from 6 × 8.5 ft (1.82 × 2.59 m) to 14 × 27 ft (4.26 × 8.22 m) the units are able to be stacked two cells high as designed and indicated below. The units consist of galvanized or stainless steel lower water collection basins, min.0.046 in. (1.2 mm) galvanized or stainless steel interior partition and exterior wall panels. The fan deck is min. 0.046 in. (1.2 mm) galvanized and stainless steel. Louvers, support structure are also galvanized and stainless steel. PVC fill supported by steel hangers, PVC distribution piping, polypropylene nozzles and aluminum alloy fan blades.
- Fill Material: BACross Wet Deck Surface PVC fill, 13 mil [0.013 in. (0.33 mm)] thick before forming by maximum 52.68 in. (1338 mm) deep with the maximum length of 120 in. (3048 mm). The leading edge of the fill pack is a minimum of 3.5 in. (90 mm) from the front exterior face of the upper tower cell and a minimum of 7.75 in. (196 mm) for the lower cell.
Fill Support: The 1500A and 3000A Cooling Towers uses 4 "D" shaped hangers constructed either of 14 Ga. Galvanized steel or 14 Ga. 304 stainless steel with a top radius of 1.3 in. (33 mm). Three fill hangers are located 2.9 in. (74 mm) from the top of the fill sheet and one is located 13.1 in. (333 mm) from the bottom of each sheet. Two hangers are located 6.5 in. (165 mm) from the front of the fill, one is located 24.5 in. (662 mm) from the front, and the final is located 6.1 in. (155 mm) from the back of the sheet.

The 1500 Cooling Tower uses between the 5 and 8 rectangular shaped fill supports constructed of either 12 Ga. Galvanized steel or 12 Ga. 304 stainless steel with a width of 1.6 in. and a height of 1.4 in. The top row of three hangers are located 4.1 in. from the top of the fill sheet and the bottom row of two hangers is located 14.6 in. from the bottom of the sheet. The middle row, if present, is situated to allow a maximum vertical spacing of 64 in. (1626 mm). The maximum horizontal spacing between fill hangers is 22 in. (559 mm).

Drift Eliminators: 3000A Cooling Towers have an optional set of drift eliminators located adjacent to the back wall of the fill pack and consist of PVC sheets, supplied in packs 8 to 23 in. (203 to 584 mm) wide, 5.75 in. (145 mm) deep by 44 to 88 in. (1118 to 2235 mm) long supported on steel lintels. The PVC sheets making up the pack are maximum 0.025 in. (0.64 mm) thick.

Cell Partition: 0.046 in. (1.2 mm) interior partition walls of the cooling towers are separated by a min. 2.5 in. (53 mm) wide air space. The total thickness of the partition wall assembly is min. 2.592 in. (65.8 mm).

Water Distribution: Galvanized or stainless steel basins with an integral water diffusion system and molded polypropylene nozzles.

Composite Cooling Solutions, L.P., 4150 International Plaza, Suite 500, Fort Worth TX 76109

Phoenix Cooling Towers are induced draft, counterflow, water cooling towers. They are provided in cell sizes ranging from approximately 10 x 10 ft (3 x 3 m) x 16 ft (4.9 m) high to 60 x 60 (18.3 x 18.3) x 54 ft (16.5 m) high. They consist of a concrete or stainless steel basin, fiberglass reinforced plastic wall panels, support columns, beams, roof deck and fan stack, PVC fill supported on FRP beams and lintels, PVC drift eliminators, PVC distribution piping, ABS nozzles and aluminum or FRP fan blades. Fan drive equipment is supported by a hot dip galvanized (HDG) steel drive torque tube and FRP columns.

Towers must have 2 or more cells and are identified with the following Model Number Code Example: 2FT-3636-100P6-FM, where 2 represents the number of cells; FT denotes the Phoenix FRP Tower; 3636 denotes cell length and cell width (36' x 36'); the 100 represents the fan motor horsepower; P denotes PVC fill; 6 denotes fill depth; and FM denotes FM Approved.

The basin is minimum 12 in. (305 mm) deep and is constructed of either concrete or minimum 12 ga. (0.1 in (2.5 mm)) gauge galvanized or stainless steel.

PVC fill consists of corrugated PVC sheets 10 mi1 (0.25 mm) thick after forming and mechanically assembled into packs measuring 1 or 2 ft (305 or 610 mm) deep by 1 ft (305 mm) wide by up to 8 ft (2.44 m) long. The fill is designated Composite Cooling Solutions Part Number 05-OF21-10-AAAA-BBB-FM, where AAAA represents the height and BBB represents the length of the fill pack in inches. Maximum depth of fill is 6 ft (1.8 m). The bottom layer of fill is supported on FRP lintels at a minimum spacing of 3 ft (914 mm) o.c. Subsequent fill layers are stacked in alternating directions. The fill bottom is located a minimum of 8 in. (2.4 m) above the maximum water level in the basin or 8 ft (2430 mm) above the basin floor.

PVC drift eliminators consist of pack assemblies 5.5 in (139.7 mm) deep by 1 or 2 ft (305 or 610 mm) wide by up to 6 ft (1.8 m) long manufactured from 15 mil (0.38 mm) PVC panels which are corrugated and mechanically joined. The 100 represents Composite Cooling Solutions Part Number PN 06-CDX-150-12-24-CCC-FM, where CCC denotes length of eliminator pack in inches and FM denotes they are for use in FM Approved towers.

The exterior wall panels are 1.25 in (32 mm) thick hollow core FRP, with each face shell having a typical thickness of 0.177 in. (4.5 mm). The FRP partition walls between cells consist of two 1.25 in. (32 mm) thick hollow core FRP panels which separate the cooling tower cells. The partition walls begin at the tower roof deck and extend downward to a minimum of 6.0 ft below the bottom of the fill pack. The horizontal and vertical FRP partition walls are caulked with CCS PN 02-3M-2000 fire caulk applied in a 0.25 in. (6.4 mm) min wide bead at all locations where hardware penetrates the walls and along all horizontal joints in one of the partition walls. A 0.25 in. (6.4 mm) wide bead is applied at all vertical joints as well as one on each side of the partition wall and side wall. All FRP beams attaching to the partition wall are sealed at the partition wall with CCS PN 02-3M-2000 fire caulk on both sides of the partition wall and capped with 1/4" fire retardant FRP plates. A final coating of sealant is added to caps at beam and wall joints.

Some towers are provided with FRP air inlet louvers and some are not. Those towers provided with louvers will have the louvers, between cells, separated by an extension of the double hollow core partition FRP wall. The partition wall extends out from the partition walls in the air inlet area by a minimum of 2 ft. This partition wall is of the same construction as the tower transverse partition wall.

Evapco Inc, 5151 Allendale Lane, Taneytown MD 21787

Evapco (Shanghai) Refrigerating Equipment Company Ltd, 1159 Luoning Rd, Baoshan District, Shanghai 200949 China

UBT Induced Draft Counterflow Towers.

UBT Material: Corrugated sheets formed of 8 mil (0.20 mm) PVC in a cross fluted design, bonded together into packs 1 ft (305 mm) wide by 1 ft (305 mm) deep, in varying lengths, 6 ft (1.8 m) avg. Fill packs may be installed up to four layers (48 in., 1.2 m) deep max.

Drift Eliminators: Pack assemblies 5 in. (127 mm) deep by 15/16 in. to 18 1/2 in. (387 to 470 mm) wide by 35 to 96 in. (0.9 to 2.4 m) long manufactured from 10 mil (0.25 mm) PVC formed into corrugated sheets and bonded together.

Inlet Louvers: Pack assemblies 2 1/2 in. (64 mm) deep by 8 to 72 in. (222 to 1830 mm) high by up to 65% in. (1608 mm) long manufactured from 10 mil (0.25 mm) PVC formed into corrugated sheets and bonded together. When inlet louvers are greater than 48 in. (1220 mm) high the louvers of adjacent cooling tower cells are separated by a min 16 ga. (0.0635 in., 1.61 mm) steel sheet that extends above 0.75 in. (19 mm) above and below the louvers and min 12 in. (305 mm) outside of the tower (perpendicular to the tower wall). The louvers inside the towers are separated by standard casing walls.

Distribution Piping: Steel.

UBT Tower cells are 8 ft (2.4 m) or 12 ft (3.7 m) wide by max 18 ft (5.5 m) long. Subdivision in these towers is completed by providing a partition extending from the pan up to the bottom of the double casing walls.

SPX Cooling Technologies Inc, 7401 W 129th St, Overland Park KS 66213

FM400 Cooling Towers are induced draft, counterflow, water cooling towers with a min 12 in. (305 mm) deep concrete or steel basin, corrugated FRP wall panels, PVC drift eliminators, PVC/polyethylene fan deck, FRP fan shroud, PVC fill, FRP distribution piping, fiberglass reinforced epoxy fan blades and an empty false bay between cells.

Towers must have two or more cells and are identified with the following code: FM4(A)(B); e.g. FM433. Where: FM4 represents the FM400 series. (A) represents the number of bays along the depth of the tower cell and (B) represents the number of bays along the front of the tower cell. There are min 3 and max 10 bays in each direction of the tower cell. FM400 Cooling Towers are constructed with cells ranging from 18 x 18 ft (5.5 x 5.5 m) to 60 x 60 (18.3 x 18.4) m sized by a 6 x 6 ft (0.3 x 0.3 m) column grid. The cooling towers are constructed with a min 3 ft (0.9 m) wide empty false bay located between adjacent cells. The structural supports for each cell are independent of adjacent cell supports. The FM410 towers are formed with the following specifications and components:

An empty false bay provides a min 3 ft (0.9 m) wide air space between adjacent cooling tower cells and is sheathed with R42 Cooling Tower Panels. The false bay roof deck consists of 1 in. SI84PF FR-FR yellow grating. The grating is 1 in. (25 mm) thick, and provides min 83% open area. A steel grate with a min 83% open area is optional. The false bay which is open at the bottom.

The outside perimeter of the fan deck for each cell is constructed using the same 1 in. SI84PF FR-FR grating as is used over the false bay and is covered with T-60 Perma Core Thread Nylon, a 200 denier green nylon tarp. The grate/nylon tarp is min 4 in. (76 mm) wide along
the false bay and min 8 in. (203 mm) wide along the outside walls. The remainder of the fan deck consists of Interlocking Deck Board. It is 12 in. (305 mm) wide with 3 in. (76 mm) dia. holes spaced at 4 in. (102 mm) o.c. The holes are filled with C-36 Cap black polyethylene caps. The bottom reinforcing ribs of the fan deck are located min 4 ft (1.2 m) above the top of the drift eliminators.

SFX FR-GRP L0140 Fan Cylinder is centered on the fan deck. Fan blades are SFX HP8 or HP7 fiberglass reinforced epoxy resin fan blades.

R42 Cooling Tower Panels sheath the external walls and internal cell partition walls. The panels are made of corrugated FRP weighing 10.8 oz/ft² (3.2 kg/m²).

SFX TU12 PVC Drift Eliminators are max 2 ft (0.6 m) wide by max 12 ft (3.7 m) long by max 5.75 in. (146 mm) high and are placed with the long dimension parallel to the false bay to FRP structural supports spaced min 6 ft (1.8 m) o.c. The bottom of the drift eliminators are located min 6 ft (1.8 m) above the top of the fill.

SFX MC-75 PVC fill packs are max 4 ft (1.2 m) high by max 2 ft (0.6 m) wide by max 1 ft (0.3 m) deep. The packs have a 2 in. (51 mm) dia. hole max 6 in. (152 mm) below the top and centered 2 ft (0.6 m) pack width. The packs are hung from a stainless steel pipe which passes through the support hole. Fill packs are oriented to run perpendicular to the false wall. Vendor Part #T-4947 ABS plastic air seals are placed at the top and bottom of the fill along the exterior walls to seal the air space between the PVC fill and the casing wall panels. The bottom of the fill is min 8 ft (2.4 m) above the max water level in the basin.

SFX NSR RTR Pipe header pipes and the NSSA distribution assembly is black polypropylene. The water distribution system, as measured to the seam line of the spray arm assembly, is located min 19 in. (483 mm) above the top of the fill.

The SFX Modulus Cooling Tower is an induced draft, counterflow cooling tower. The towers contain 12 ft (3658 mm) wide by 24 ft (7315 mm) long modular assembled units, which are field module, the middle unit is the spray system and eliminator module and the top unit is the plenum and fan deck module. The units consist of a 11 ga. stainless steel support structure and 16 ga. fire partitions and the components related to the particular module. The outer casings are constructed of Glass Reinforced Plastic (GRP). The abutting sidewall and endwall areas are sheathed with 16 ga. stainless steel sidewall partition shields that extend 18 in. (460 mm) on either side of the adjacent cells. The fan deck and shroud are constructed of Fiber Reinforced Plastic (FRP). The abutting fan deck areas are also sheathed with 16 ga. stainless steel fire partition deck covers that extend 18 in. (460 mm) on either side of the adjacent cells. The partition shields are fastened through to the structural elements of the tower. The fill material and distribution piping are constructed out of Polyvinyl Chloride (PVC). The water distribution nozzles are polypropylene and the fan blades are epoxy resin.

Drift Eliminators: PVC sheets maximum 0.020 in. (0.51 mm) thick, supplied in packs 24 in. (610 mm) wide. 5.75 in. (145 mm) deep by 138 in. (3505 mm) long by 5.75 in. (146mm) thick and are supported on 16 Ga. stainless steel support angles. Drift Eliminator located in the center are supported directly on the 16 in. (405 mm) diameter header pipe or on a 16 Ga. stainless steel, channel shaped spacer located over the top of a 10 in. (255 mm) header pipe.

Fill Material: SFX MC 75 and MC 47 fill pack assemblies. The MC 75 are vertically hung units 5.86 ft (1.78 m) wide by 11.5 ft (3.5 m) long, assembled to a maximum of 6.0 ft (1.83 m) in height. The individual sheets are 0.75 in. (19 mm) apart and manufactured from 20 mil (0.511 mm) PVC. The MC 47 are vertically hung units 3.9 ft (1.19 m) wide by 11.5 ft (3.5 m) long, assembled to a maximum 4.0 ft (1.22 m) in height.

The individual sheets are 0.47 in. (12 mm) apart, manufactured from 15 mil (0.38 mm) PVC.

Fill Support: MC 75 fill packs used support tubes constructed of 2 in. (50 mm) fill support tubes constructed of 20 Ga. S300 stainless steel. The two outside fill hangers are located 11.2 in. (284 mm) from the front and back edges of the fill sheet and the center tube is centered 35.2 in. (333 mm) from the edge of the sheets. The tubes are centered 6 in. (152 mm) from the top of the fill. The MC 47 fill packs use two, 2 in. (50 mm) fill support tubes constructed of 20 Ga. S300 stainless steel. The two fill hangers are located 11.4 in. (290 mm) from the front and back edges of the fill sheets. The tubes are centered 6 in. (152 mm) from the top of the fill.

Exterior Casing: Resolute R 42FR, 8 oz. (0.227 g), horizontally oriented Glass Reinforced Plastic (GRP) sheets. The sheets are 7.2 in. (183 mm) pitch rib type. The vertical ends of the casings are sealed with foam seal strips. Casing is attached to the structural frame with series 300 stainless steel self-drilling screws.

Interior Fire Partition Walls: 16 ga. stainless steel and are mechanically fastened to the structure assembly. These walls are installed on every interior wall of each module. When the tower is constructed, the fire partition walls are extended below the fill pack assemblies min. of 4.0 ft (1.22 m).

Root Deck: B2P3R interlocking, pultruded fiberglass panels. The panels are 12 in. (305 mm) wide by 1.12 in. (28.45 mm) high and are produced in continuous lengths that vary depending on the size of the tower. Panels are attached to the stainless steel structure with series 300 stainless steel self-drilling screws.

Fan Cylinders: Molded fire retardant Fiber Reinforced Plastic (FRP) with eased inlets.

Fan Cylinders: Epoxy resin with multiple hollow core resin blades. HP 7000.

Water Distribution System: PVC distribution piping with each modular having an independent distribution system fed from an exterior inlet manifold. The distribution nozzles and distribution rings are of molded polypropylene fed by a molded distribution tee attached to the bottom of the PVC distribution pipe.

M-Models: 8310-8312 Towers in multi-cell installations (for single cells, see Cooling Tower Fill Components for Factory Assembled Units). Induced draft crossflow cooling towers stacked two modules high, utilizing the following components:

Hanging MX75L (integral louver) crossflow PVC fill comprised of unglued, vacuum formed individual sheets 15-20 mil, (0.015-0.020 in., 0.38-0.51 mm) thick, with sheet spacing of 0.74 in. (19 mm) c. to c., and fill height of 8.41 ft (2.56 m) in each module. Depth (total air travel distance) is 4 ft (1.22 m) and the width (perpendicular to air travel) is maximum 13.5 ft (4.11 m). The sheets are supported by four 2.378 in. (60 mm) dia. steel tubes, two of which are inserted through holes 4.05 in. (103 mm) from the top of the sheets.

TU12X drift eliminators are made of maximum 20 mil (0.020 in., 0.51 mm) thick PVC sheet, and assembled into packs 1 ft (0.3 m) wide and 5.75 in. (146 mm) thick. The eliminators are retained vertically against the MX75L sheets by a 90° leg which is essential to the hot water basin.

The bottom of the pack is supported by a galvanized channel which utilizes integral legs on both fill and plenum sides. Eliminators are also retained by a steel strap at approximately mid-height on the inboard face.

The top tower module has a 2° extension outboard of the cell wall extending out beyond the louver face (one per side between each cell), consisting of a 2 ft by 9 ft (0.6 m x 2.7 m) steel panel, designated as the FM Wing.

Noses are polypropylene.

Fan Cylinder is either steel or FR-FRP up to 6 ft (1.83 m) tall and includes an FR-FRP cornered louver panel. Tower has air inlet screens, and may have optional single inlet PVC piping.

PVC filled Unilite/Unilite L cooling towers are induced draft, counterflow, water cooling towers with a min 12 in. (305 mm) deep concrete or 12 ga. (0.1 in. [2.5 mm]) thick galvanized or stainless steel basin, 2.5 in. (64 mm) thick hollow core FRP outside walls, support columns, fan deck and fan shroud, PVC fill supported on cast iron or FRP lintels, PVC, stainless or HDG steel drift eliminators supported on PVC or FRP distribution piping, ABS nozzles and aluminum or fiberglass reinforced epoxy fan blades supported by a steel riser pipe or by an FRP column.

Towers must have two or more cells and are identified with the following code, used without the [ ] (number of cells)[UL or ULL]-[cell length (ft)][cell width (ft)]-[motor HP][P or T][fill height (ft)]-FM, where: UL denotes Unilite Tower; ULL denotes Unilite L Tower; P denotes PVC Fill; T denotes Ceramic Tile Fill; FM denotes FM Approved. Individual cells range in size from 9 by 12 ft (2.7 by 3.7 m) to 42 by 42 ft (12.8 by 12.8 m).

Drift eliminators are SPX Cooling Technologies, Inc P/N 05-032-000-001, P/N 06-045-000-001 PVC.

FRP partition walls are two 1.25 in. (32 mm) thick hollow core panels which separate the cooling tower cells beginning at the wall panel cap. The horizontal and vertical joints of the FRP partition walls shall be caulked with GE RTV133 Silicone Adhesive Sealant applied in a min 0.25 in. (6.4 mm) wide bead at all locations where hardware penetrates the walls and along all horizontal joints in one of the partition wall panels and one 0.25 in. (6.4 mm) wide bead is applied at three vertical joint locations on one side of the interior vertical column/wall joints. Partition walls extend min 4 ft (1.2 m) below the bottom of the fill.

FM Approvals
Crossflow Cooling Tower Fill Material and Drift Eliminators

The following materials are FM Approved only when installed in the specified pattern. Unless noted otherwise, fill height is restricted to a maximum of 70 ft (21 m). All other tower structural elements must be noncombustible, including wall siding, fan or roof decks, the hot water basin, louver columns and louvers.

SPX Cooling Technologies Inc, 7401 W 129th St, Overland Park KS 66213
Class 700 Components.

PVC Fill Material:
- V-1 Bar, V-shaped 3.4 in. (86 mm) wide, 48 in. (1.2 m) long, 0.117 lb/lin. ft (1.74 gr/cm), min horizontal spacing 8 in. (203 mm) and min vertical spacing 8 in. (203 mm).
- V-2 Bar, V-shaped 4.25 in. (108 mm) wide, 56 in. (1.4 m) long, 0.161 lb/lin. ft (2.4 gr/cm), min horizontal spacing 8 in. (203 mm) and min vertical spacing 8 in. (203 mm).
- M-Bar, M-shaped 51⁄2 in. (140 mm) wide, 48 in. (1.2 m) long, 0.091 lb/lin. ft (1.35 gr/cm), min horizontal spacing 16 in. (406 mm) and min vertical spacing 4 in. (102 mm) staggered.
- Alpha Bar, A-shaped (rounded) 1.8 in. (45.7 mm) wide, 1.7 in. (43.2 mm) high, 64 in. (1.6 m) long, 0.25 lb/lin. ft (3.72 gr/cm), min horizontal spacing 6 in. (152 mm) and min vertical spacing 8 in. (203 mm).
- Omega Bar, A-shaped (half round with wing feet) 2.07 in. (53 mm) wide, 47.5 in. (1.2 m) long, 0.75 in. (19.1 mm) high, 0.19 lb/lin. ft (2.83 gr/cm), min horizontal spacing 8 in. (203 mm) and min vertical spacing 4 in. (102 mm).

Drift Eliminators:
- PVC SDV-75, -100, -150 vertical type, 1 ft (0.3 m) wide, 6 ft (1.8 m) high, 5 in. (127 mm) thick.
- PVC TU-7.5X, -10X, -12X, -15X vertical type, up to 2 ft (0.6 m) wide, 6-7 ft (1.8-2.1 m) high, 53⁄4 in. (146 mm) thick, manufactured from 20 mil (0.51 mm) PVC.
- Model TU10. Pack assemblies 1 ft (0.3 m) wide by 10 ft (3.05 m) long by 53⁄4 in. (146 mm) deep, placed horizontally, manufactured from 20 mil (0.51 mm) or 30 mil (0.76 mm) PVC.

Distribution Piping:
- FR-RTR Header Distribution pipes, max 48 in. (1.2 m) dia. FR-RTR Branch and Standpipe Distribution Pipes, 6 in. (0.15 m), 10 in. (0.25 m), 12 in. (0.3 m) dia.
- Branch Arm and Nozzle Assembly. 2.39 in. (6.08 cm) o.d., black polypropylene pipe and black polypropylene nozzle.

Steel Sigma Tower Components:
- MX75LEV (Louver fill sheet section & eliminator fill sheet section).
- Louver fill sheets (at outlet edge) 144 in. (3.66 m) in height by 30.5 in. (0.77 m) wide by 0.02 in. (0.51 mm) thickness max formed from PVC sheet.
- Eliminator fill sheets (with integral entrained water separator) 144 in. (3.66 m) in height by 32 in. (0.81 m) wide by 0.02 in. (0.51 mm) thickness max formed from PVC sheet.
- Fill (cube) dimensions (per cell) 144 in. (3.66 m) tall by 62.5 in. (1.59 m) wide by 12 ft (3.66 m) min to 28 ft (8.53 m) max width. Sheets are hung vertically at 0.75 in. (19 mm) spacing. Each fill sheet section is suspended edge-to-edge on two support tubes (4 total) inserted through holes 4.5 in. (114 mm) from the top of the fill.
- Support tubes are 2 in. (51 mm) dia. 4 ft (1.21 m) long steel, suspended from the tower structure by stainless steel hangars every 2 ft (0.61 m).
- Alignment tubes are 2 in. (51 mm) dia. 4 ft (1.21 m) long PVC inserted in a hole lower down in both the louver and eliminator fill sheets.
- Pipe. Fire retardant polyester & fiberglass above steel hot water basin.
- Casing. Fire retardant polyester & fiberglass with steel inner casing in the fill compartment.
- Target Nozzles. Polypropylene.
- PVC Fill Material. BACross molded from 15 mil (0.38 mm) thick PVC and used in Series 4009 steel structure crossflow cooling towers. Min spacing 3⁄4 in. (19 mm). Max fill height 190 in. (4.83 m). Max depth (in direction of air travel) 501⁄2 in. (1.28 m). Max length (along air inlet face) 441⁄2 in. (11.21 m).
- Drift Eliminators. Drift eliminators used in Series 4009 steel structure crossflow cooling towers are molded as integral part of fill material from 15 mil (0.38 mm) thick PVC. Min spacing 3⁄4 in. (19 mm). Max height 190 in. (4.83 m). Max depth of fill plus drift eliminator 501⁄2 in. (1.28 m). Max length (along air inlet face) 441⁄2 in. (11.21 m).
- Fan Blades. Tuf-Lite fiberglass-reinforced epoxy fan blades in Tuf-Lite fans ranging in dia. from 7 to 30 ft (2.13 to 9.14 m).

Counterflow Cooling Towers

The following water cooling towers are FM Approved when installed as specified below in single or multi-cell configurations using the materials and components shown.

SPX Cooling Technologies Inc, 7401 W 129th St, Overland Park KS 66213
Class 800 Cooling Towers are natural draft or induced draft, counterflow cooling towers with a concrete basin, concrete walls, concrete roof deck and concrete structural components. Concrete culverts measuring 3 ft 10 in. (1.2 m) wide by 11 ft 2.75 in. (4.3 m) deep internally subdivide each tower into a minimum of three segments.

PVC Fill consists of:
Counterflow Cooling Tower Fill Material and Drift Eliminators

SPX Cooling Technologies Inc, 7401 W 129th St, Overland Park KS 66213


Unilite 1000 Series. Models UL 325 through UL 2700. Plan areas from 18 × 18 ft (5.5 × 5.5 m) to 52 × 52 ft (15.8 × 15.8 m).

The above towers may be fabricated with the following components:

FRP Structure: Consists of FRP wall panels, exterior support columns, fan or roof deck and fan shroud. The FRP components are erected on a concrete basin and support structure.

Fill Material: Permagrid ceramic tile on cast iron or FRP support lintels.

Drift Eliminators: Stainless steel or HDG steel.

Water Distribution System: Fire retardant treated Schedule 40 FRP pipe, ABS nozzles.

Fan: Either fire retardant treated fiberglass reinforced epoxy fan blades or aluminum.

MS, Components. Film Fill Configurations:

Plenum Partitions. R42FR Fire Retardant Glass Reinforced Polyester (FR-GRP) panels used to divide plenum into areas of 2 fans per area.

High Temperature MC67: 1 ft (0.3 m) wide by 1 ft (0.3 m) thick by 4 ft (1.2 m) long logs of MC67 (standard configuration as described above) made from CPVC are placed on top of standard MC67 PVC fill. Total fill height is 6 ft (1.8 m) max. Max plan area is 4800 ft² (445 m²). Barriers restricting plan areas to 4800 ft² (445 m²) must be concrete or 24 ga. stainless steel extending at least 6 in. (150 mm) above and 6 in. (0.15 m) below the fill.

Drift Eliminators are located 7 ft (2.1 m) above the top of the fill and consist of:

Models TU-7.5C, -10C, -12C, -15C. Pack assemblies up to 2 ft (0.6 m) wide by 12 ft (3.6 m) long by 5 3⁄4 in. (146 mm) thick, placed horizontally, manufactured from 20 mil (0.52 mm) PVC.

Model TU10. Pack assemblies 1 ft (0.3 m) wide by 10 ft (3.05 m) long by 5 3⁄4 in. (146 mm) deep, placed horizontally, manufactured from 20 mil (0.51 mm) or 30 mil (0.76 mm) PVC.

Water Distribution is located between the fill and drift eliminators and consists of:

- FR-TRR Header Distribution pipes, max 48 in. (1.2 m) dia. FR-TRR Branch and Standpipe Distribution Pipes, 6 in. (0.15 m), 10 in. (0.25 m), 12 in. (0.3 m) dia. PVC, max 18 in. (460 mm) o.d.
- Branch Arm and Nozzle Assembly: 2.39 in. (6.08 cm) o.d., black polypropylene pipe and black polypropylene nozzle.
- FR-GRP Louvers. Max 9 oz (0.055 in.) thick by 59 in. (150 cm) long by 10.5 in. (27 cm) wide, supported horizontally in the tower by stainless steel brackets.

Plenum partitions for induced draft towers consist of: R42FR Fire Retardant Glass Reinforced Polyester (FR-GRP) panels used to divide plenum into areas of 2 fans per area. The plenum partition to the fan deck and are supported on the concrete walls that support the drift eliminators.

Fan blades for induced draft towers are located 35 ft (10.7 m) above the top of the fill and consist of:

HP4 Fan Blade. For 336 in. (8.5 m) dia. fans. Polyester and fiberglass composite, airfoil shape, 5 in. (127 mm) dia. shank, 137 3⁄8 in. (3.5 m) blade length. Assembled max 12 per fan with metallic hub and fire-retardant glass reinforced hub cover. Uses either X-Rib or V-Rib fan cylinder.

HP6 Fan Blade. For 10 meter (32.8 ft) dia. fans. Polyester and fiberglass composite with a urethane foam core, airfoil shape, 5 in. (127 mm) dia. shank, 166 3⁄4 in. (4.24 m) blade length. Assembled max 12 per fan with metallic hub and fire-retardant, glass reinforced hub cover. Uses 10 meter (32.8 ft) fan cylinder.

HP8 Fan Blade. Ten meter (32.8 ft) dia. fans max. Polyester and two-ply unidirectional sheet molding compound cloth, with a polyurethane foam core, air foil shape, 5 in. (127 mm) dia. shank, 157 7⁄8 in. (4.01 m) blade length. Assembled max 14 per fan with metallic hub and fire-retardant glass reinforced hub cover. Uses 10 meter (32.8 ft) fan cylinder.

Fan cylinders consist of:

- X-Rib 336 in. (8.5 m) dia. Fan Cylinder. Composed of 7 25 ft (2.21 m) wide by 18 ft (5.5 m) high curved panels with center X-Rib support structure. Assembled a max of 16 per circular fan shroudstack. Fire-retardant polyester and fiberglass composite. Ribs firestop modified.
- V-Rib 336 in. (8.5 m) dia. Fan Cylinder. Composed of 6 2 ft (1.88 m) wide by 18 ft (5.5 m) high curved panels with flanges at the edges and a center vertical rib support structure. Assembled a max of 16 per circular fan shroudstack. Fire retardant polyester and fiberglass composite. Ribs firestop modified.

10 meter (32.8 ft) Fan Cylinder. Composed of 7 ft (2.13 m) wide by 18 ft (5.49 m) high curved panels with flanges at edges and a center X-Rib support structure. A single rib is present across the top for increased rigidity. Assembled a max of 16 per a circular fan shroudstack. Fire-retardant polyester and fiberglass composite. Ribs firestop modified.

Cooling Towers, System Components

SPX Cooling Technologies Inc, 7401 W 129th St, Overland Park KS 66213

Counterflow Cooling Tower Fill Material and Drift Eliminators

May 2008 — Approval Guide

Cooling Towers, System Components
Cooling Tower Fill Components for Factory Assembled Units

The following materials are FM Approved for use when installed in the prefabricated factory assembled units as described. The factory assembled units are generally smaller than the field-erected cooling towers and may often be located on building roofs as well as at ground level. All other elements of the tower must be noncombustible, including wall siding, fan or roof decks, hot water basin, columns and louvers, unless they have been evaluated and FM Approved.

**Baltimore Aircoil Co Inc, Box 7322, Baltimore MD 21227**

**Fill Material:**

**BCross.** Corrugated sheets molded of 13-20 mil (0.33-0.51 mm) PVC and used in FXT and Series 3000 (Models 3XXX and 33XXX) crossflow units having steel casing. Min spacing 3⁄4 in. (19 mm) between sheets. For FXT max fill height 112 in. (2.84 m); max depth 39⁄2 in. (1.0 m); max width 87 in. (2.21 m). For Series 3000 max fill height 128 in. (3.25 m); max depth 50⁄2 in. (1.28 m); max width 131 in. (3.32 m).

**BAcount.** Corrugated sheets molded of 13-20 mil (0.33-0.51 mm) PVC and used in VXT, VXMT, VTO, VT1, VT2 and Low Profile Series V crossflow units having steel casing. Min spacing 3⁄4 in. (14 mm) between sheets. Max fill height 48 in. (1.22 m). Max length in single cell 216 in. (5.49 m). Max width 79 in. (2.01 m).

**Drift Eliminators:**

Eliminators used in FXT, Series 3000 (Models 3XXX and 33XXX) and Ejector II units having steel casing are corrugated in shape. All are molded from 13-20 mil (0.33-0.51 mm) thick PVC sheets (VXT, VXMT, VTO, VT1, VT2 and Low Profile Series V) have steel eliminators.

Eliminators in FXT crossflow units are molded as an integral part of fill material. Min spacing 3⁄4 in. (19 mm), Max height 112 in. (2.84 m). Max width 87 in. (2.21 m).

Eliminators in Series 3000 (Models 3XXX and 33XXX) are molded as an integral part of fill material. Min spacing 3⁄4 in. (19 mm). Max height 128 in. (3.25 m). Max width 131 in. (3.32 m).

Eliminators in Ejector II hydraulically aspirated parallel flow units are 10⁄2 in. (262 mm) deep. Min spacing 3⁄4 in. (19 mm). Max height 136 in. (3.45 m). Max width 95 in. (2.43 m).

Air Inlet Stabilizers: Air inlet stabilizers used in Ejector II hydraulically aspirated parallel flow units are corrugated sheets molded from 13-20 mil (0.33-0.51 mm) thick PVC sheets. Min spacing 3⁄4 in. (19 mm). Depth 4⁄16 in. (111 mm). Max height 136 in. (3.45 m). Max width 95 in. (2.43 m).

The louvers used on the Series 3000 are 2.67 in. (67.8 mm) wide by 0.785 in. (19.9 mm) thick FRP or 20 ga. (0.0358 in. [0.9 mm] thick) galvanized or stainless steel.

**Evapco Inc, 5151 Allendale Lane, Taneytown MD 21787**

**Cooling Tower Fill Components for Factory Assembled Units**

The following materials are FM Approved for use when installed in the prefabricated factory assembled units as described. The factory assembled units are generally smaller than the field-erected cooling towers and may often be located on building roofs as well as at ground level. All other elements of the tower must be noncombustible, including wall siding, fan or roof decks, hot water basin, columns and louvers, unless they have been evaluated and FM Approved.

**SPX Cooling Technologies Inc, 7401 W 129th St, Overland Park KS 66213**

**HP4 Fan Blade.** For 336 in. (8.5 m) dia. fans (used in NCA200, NC8200, Class 600, 700 and 800 towers). Polyester and fiberglass composite, airfoil shape, 5 in. (127 mm) dia. shank, 137⁄8 in. (3.5 m) blade length. Assembled max 12 per fan with metallic hub and fire-retardant glass reinforced hub cover. Uses either X-Rib or V-Rib fan cylinder.

**X-Rib 336 in. (8.5 m) dia. Fan Cylinder.** Composed of 7.25 ft (2.21 m) wide by 18 ft (5.5 m) high curved panels with center X-rib support structure. Assembled a max of 16 per circular fan shroud/stack. Fire-retardant polyester and fiberglass composite. Ribs firestop modified.

**V-Rib 336 in. (8.5 m) dia. Fan Cylinder.** Composed of 6.2 ft (1.88 m) wide by 18 ft (5.5 m) high curved panels with flanges at the edges and a center vertical rib support structure. Assembled a max of 16 per circular fan shroud/stack. Fire retardant polyester and fiberglass composite. Ribs firestop modified.

**HP6 Fan Blade.** For 10 meter (32.8 ft) dia. fans (used in Class 600, 700 and 800 towers). Polyester and fiberglass composite with a urethane foam core, airfoil shape, 5 in. (127 mm) dia. shank, 166⁄4 in. (4.24 m) blade length. Assembled max 12 per fan with metallic hub and fire-retardant, glass reinforced hub cover. Uses 10 meter (32.8 ft) fan cylinder.

10 meter (32.8 ft) Fan Cylinder. Composed of 7 ft (2.13 m) wide by 18 ft (5.49 m) high curved panels with flanges at edges and a center X-rib support structure. A single rib is present across the top for increased rigidity. Assembled a max of 16 per a circular fan shroud/stack.

Fire-retardant polyester and fiberglass composite. Ribs firestop modified.

**HP7, HM Fan Blade.** For 120, 144, 168, 216 in. (3, 3.65, 4.27, 5.5 m) dia. fans (used in MS and steel sigma towers). Epoxy or Vinyl Ester resin and fiberglass composite, airfoil shape, hollow 50 in. through 96 in. (1.26 through 2.4 m) overall blade length. Assembled max 8 per fan with a metallic fan hub and a fire-retardant glass reinforced hub cover. All blades use HP7 reflex fan cylinder.

**HP7, 120, 144, 168, 216 in. (3, 3.65, 4.27, 5.5 m) dia. Reflex Fan Cylinder.** 5 ft (1.5 m) wide by 7 ft (2.13 m) high curved panels with flanges at the edges and one horizontal reinforcing rib. Assembled a max of 12 per circular fan shroud/stack. Fire retardant polyester and fiberglass composite.

**HP8 Fan Blade.** Ten meter (32.8 ft) dia. fans (used in Class 600, 700 and 800 towers). Polyester and two-ply unidirectional sheet molding compound cloth, with a polyurethane foam core, air foil shape, 5 in. (127 mm) dia. shank, 157⁄4 in. (4.01 m) blade length. Assembled max 14 per fan with metallic hub and fire-retardant, glass reinforced hub cover. Uses 10 meter (32.8 ft) fan cylinder.

Evapco (Shanghai) Refrigerating Equipment Company Ltd, 1159 Luoning Rd, Baoshan District, Shanghai 2000949 China

At ICT, REP and USS Induced Draft Counterflow Towers:

**Fill Material:**

Pack assemblies 12 in. (305 mm) deep by 12 in. (305 mm) wide by the required length up to 72 in. (1830 mm), consisting of PVC sheets that are a maximum of 8 mil (0.2 mm) thick. Fill packs may be installed up to four layers (48 in., 1.2 m) deep max.

**Drift Eliminators:**

Pack assemblies 5.5 in. (140 mm) deep by 12 in. (305 mm) wide by the required length up to 72 in. (1.83 m) consisting of 15mil (0.375 mm) PVC formed into corrugated sheets and bonded together.

Inlet Louvers: Pack assemblies 28 in. (64 mm) deep by 12 in. (305 mm) wide by the required length up to 72 in. (1.83 m) consisting of 15 mil (0.375 mm) PVC sheets, except for the end sheets which are 30 mil (0.75 mm) formed into corrugated sheets and bonded together.

**FM Approvals**
When inlet louvers are greater than 48 in. (1220 mm) high the louvers of adjacent partitioned cells or adjacent cooling tower cells are separated by a min 16 ga. (0.0635 in., 1.61 mm) galvanized steel or stainless steel partition that extends min 0.75 in. (19 mm) above and below the louvers and min 12 in. (305 mm) outside of the tower (perpendicular to the tower wall). The louvers inside the towers are separated by standard partition wall.

Distribution Piping: Galvanized or Stainless Steel main header or header box. Spray branches will be galvanized or stainless steel.

AT Tower cells are 8, 8.5, 12 or 14 ft (2.4, 2.7, 3.7 or 4.3 m) wide by max 24 ft (7.3 m) long.

ICT Tower cells are 3 or 4 ft (0.9 or 1.2 m) wide by max 12 ft (3.7 m) long.

REP Tower cells are 8.5 or 12 ft (2.59 or 3.66 m) wide by max 20 ft (6.1 m) long.

USS Tower cells are approximately 8 ft (2.44 m), 8.5 ft (2.59 m), 12 ft (3.66 m) or 14 ft (4.27 m) wide by max 24 ft (7.3 m) long maximum.

All single cell AT, ICT, REP, and USS tower arrangements require a 16 ga. (0.0635 in., 1.61 mm) stainless steel or galvanized steel partition extending from the pan up through the fill and drift eliminators into the fan section to subdivide the tower in half. Multiple cell towers, by design, are provided with separate casing sections isolated by double sheet metal. Subdivision in these towers is completed by providing a partition extending from the pan up to the bottom of the double casing walls. Max size of single cell with one partition is 13 ft 111⁄2 in. by 23 ft 9 in. (4.3 by 7.2 m).

Distribution Piping: Galvanized or Stainless Steel main header or header box. Spray branches will be galvanized or stainless steel.

LSTA and LSTB Tower cells are approximately 4 ft, 5 ft, 8, 9 ft 9.75 in., or 10 ft wide by max 18 ft (5.49 m) long.

PMTA Forced Draft Counterflow Towers.

Fill Material: Pack assemblies 12 in. (305 mm) deep by 12 in. (305 mm) wide by the required length up to 72 in. (1830 mm), consisting of PVC sheets that are a maximum of 8 mil (0.2 mm) thick. Fill packs may be installed up to four layers (48 in., 1.22 m) deep max. Units less than 18 ft (5.49 m) long will be provided with a 16 ga. (0.0635 in., 1.61 mm) stainless or galvanized steel partition extending from the pan up through the fill and drift eliminators to subdivide the tower. Units longer than 18 ft (5.49 m) are provided with two or more separate casing sections isolated by double sheet metal walls. Subdivision in these towers is completed by a partition extending from the pan up to the bottom of the double casing walls. Max size of single cell with one partition is 10 ft by 18 ft (3.05 by 5.5 m).

Drift Eliminators: Pack assemblies 5.5 in. (139 mm) deep by 13 ft 111⁄2 in. (405 mm) wide by the required length up to 72 in. (1.83 m) long consisting of PVC sheets that are a maximum of 15 mil (0.375 mm) thick.

Distribution Piping: Galvanized or Stainless Steel main header or header box. Spray branches will be galvanized or stainless steel.

LSTA and LSTB Tower cells are approximately 4 ft, 5 ft, 8, 9 ft 9.75 in., or 10 ft wide by max 18 ft (5.49 m) long.

PMTA Forced Draft Counterflow Towers.

Fill Material: Pack assemblies 12 in. (305 mm) deep by 12 in. (305 mm) wide by the required length up to 72 in. (1830 mm), consisting of PVC sheets that are a maximum of 8 mil (0.2 mm) thick. Fill packs may be installed up to four layers (48 in., 1.22 m) deep max. Units less than 18 ft (5.49 m) long will be provided with a 16 ga. (0.0635 in., 1.61 mm) stainless or galvanized steel partition extending from the pan up through the fill and drift eliminators to subdivide the tower. Units longer than 18 ft (5.49 m) are provided with two or more separate casing sections isolated by double sheet metal walls. Subdivision in these towers is completed by a partition extending from the pan up to the bottom of the double casing walls. Max size of single cell with one partition is 10 ft by 18 ft (3.05 by 5.5 m).

Drift Eliminators: Pack assemblies 4.5 in. (114 mm) deep by 23.25 in. (591 mm) wide by the required length up to 120 in. (3.05 m) long consisting of PVC sheets that are a maximum of 25 mil (0.625 mm) thick.

Distribution Piping: Galvanized or Stainless Steel main header or header box. Spray branches will be galvanized or stainless steel.

Series 4800 Aquatower Components.

MX75-8.1LEV crossflow PVC sheet fill (fill and drift eliminators combined), with max thickness of 15 mil, 0.74 in. (19 mm) c. to c. sheet spacing, comprised of unglued, vacuum formed individual sheets supported by 2 in. (51 mm) dia. tubes (two) inserted through holes 4.05 in. (103 mm) from the top of the sheets. The air entry side of the sheets contain integrally formed eliminators. An additional PVC alignment tube is inserted through a hole lower down in the fill sheet. Fill height is max 9.79 ft (3 m) for NC 8306. Depth (total air travel distance) is 48.5 in. (1.23 m) and width (perpendicular to air travel) ranges from min 6 ft (1.83 m) to max 12 ft (3.66 m).

All tower units (NC 8301-8307) shall contain a 20 ga. galvanized steel partition at each end of the unit within the fill itself. The partition will be located in the middle of the fill compartment and extend from the hot water basin vertically down to the cold water basin. This will provide four essentially separate fill segments within each tower unit.
NC Models 8301-8304 Towers.
NC Models 8301-8304. MX75-8.1LEV crossflow PVC sheet fill with max 20 mil thickness, formed individual sheets supported by 2.378 in. (60 mm) dia. steel tubes (two) inserted through holes 4.05 in. (103 mm) from the top of the sheets. The air entry side of the sheets contains integrally formed louvers and the air exit side contains integrally formed eliminators. An additional PVC alignment tube is inserted through a hole in the lower portion of the fill sheet. Fill height is a max 117.5 in. (2.98 m) for NC 4000. Max depth is 38 in. (0.91 m) and width perpendicular to air travel ranges from 8 ft (2.43 m) min to 8.5 ft (2.59 m) max.

NC 8307 Components.
MX75L crossflow PVC or CPVC fill (integral louver), with max sheet thickness of 20 mil and fill height of 10.125 ft (3.09 m). Depth (total air travel distance) is 54.75 in. (1.39 m) and the width (perpendicular to air travel) is 11.5 ft (3.51 m) max. The sheets are supported by two 2 in. (51 mm) dia. steel tubes inserted through holes 4.05 in. (103 mm) from the top of the sheets. An additional PVC alignment tube is inserted through a hole lower down in the fill sheet.

Drift Eliminators:
PVC or CPVC TU10 x 4 eliminators (20 mil max sheet thickness) are assembled into 1 ft (0.3 m) wide, 10 ft (3.05 m) high and 5.75 in. (146 mm) thick packs. The eliminators are retained vertically against the MX75L sheets by a 90° leg which is essential to the hot water basin.

NC Tower Models 8310-8312 in single-cell installations (for multiple cells, see Multi-Cell Cooling Towers section). Induced draft crossflow cooling towers stacked two modules high, utilizing the following components:
Hanging MX75L (integral louver) crossflow PVC fill comprised of unglued, vacuum formed individual sheets 15-20 mil, (0.015-0.020 in., 0.38-0.51 mm) thick, with sheet spacing of 0.74 in. (19 mm) c. to c., and fill height of 8.41 ft (2.56 m) in each module. Depth (total air travel distance) is 4 ft (1.22 m) and the width (perpendicular to air travel) is maximum 13.5 ft (4.11 m). The sheets are supported by four 2.378 in. (60 mm) dia. steel tubes, two of which are inserted through holes 4.05 in. (103 mm) from the top of the sheets.
The fill areas are divided in half by a special vertical 18 ga. galvanized or stainless steel partition on each side of the cell, extending from the top of the floor of the cold water basin to the bottom of the hot water basin.
TU12X drift eliminators are made of maximum 20 mil (0.020 in., 0.51 mm) thick PVC sheet, and assembled into packs 1 ft (0.3 m) wide and 5.75 in. (146 mm) thick. The eliminators are retained vertically against the MX75L sheets by a 90° leg which is essential to the hot water basin.
The bottom of the pack is supported by a galvanized channel which utilizes integral legs on both fill and plenum sides. Eliminators are also retained by a steel strap at approximately mid-height on the inboard face. Nozzles are polypropylene.
Fan cylinder is either steel or FR-FRP up to 6 ft (1.83 m) tall and includes an FR-FRP contoured eased inlet. Tower has air inlet screens, and may have optional single inlet PVC piping.