



**COOLING TOWER
VF-19 PLUS
ANTI-FOULING FILL**

PRODUCT SPECIFICATION

The fill is to be manufactured by Brentwood Industries, or equal and will meet the following specifications:

1. Scope:

Accu-Pac® VF-19 PLUS (vertical-flow) high density sheet fill is designed for cooling of power plant, petrochemical and other process cooling waters. Fill shall be furnished as modules designed to be anti-fouling.

2. Material of Construction:

A. General

The fill shall be fabricated from rigid, corrugated PVC sheets that are conducive to cooling water and are UV protected. The fill modules shall be resistant to rot, fungi, bacteria and inorganic/organic acids and alkalies as commonly found in cooling towers.

B. PVC Sheets

The PVC sheet shall be prime, rigid PVC conforming to commercial standard ASTM D1784:12344B to 12454B with the following properties:

PROPERTIES	ASTM TEST METHOD	UNIT		VALUE (min. unless otherwise noted)	
		IP	SI	IP	SI
Specific Gravity	D792	Dimensionless		1.45 max.	
Tensile Strength	D638/D882	psi	mPa	6,000	41.4
Flexural Modulus	D790	psi	mPa	425,000	2931
Flexural Strength	D790	psi	mPa	11,000	75.9
Elastic Modulus	D638/D882	psi	mPa	360,000	2,483
Izod Impact	D256	ft-lbs/in	j/cm	1.0	0.534
Impact Resistance	D4226	in-lbs/mil	j/mm	1.2	5.34
Heat Deflection	D648	°F	°C	160	71
Flame Spread Rating	E-84	Dimensionless		less than 20	
Flammability	D635			Self-extinguishing <5 sec.	

C. Chemical Resistance

Resistance to Grease Fats, & Oils	Excellent	ASTM D722-45
Resistance to Acids	Excellent	ASTM D543
Resistance to Alkalies	Excellent	ASTM D543



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D. Temperature Resistance

Material of Construction	Max. Continuous Operating Temperature		Max. Peak Temp.*	
	F	C	F	C
PVC	140	60	155	68
HPVC	150	66	165	74

* Duration of peak temperatures not to exceed 2 hours

The PVC sheets shall be of uniform thickness and free from holes, air bubbles, foreign matter, undispersed raw material or other manufacturing defects which may adversely affect their performance.

E. Fill Modules

- 1) The fill modules shall be fabricated from PVC sheets of quality stated above and formed in a pattern to provide "vertical flow" between the adjacent sheets. The height of each corrugation as measured at the pack's edge shall be 1.5 inches. All flow cavities (flutes) formed between adjacent sheets shall allow air and water to flow freely along the each sheet to provide flow equalization.
- 2) The fill modules shall ensure adequate contact between the water and air by providing for a suitable microstructure for the liquid path.
- 3) The fill modules shall measure up to 24" (610mm) wide, 23-5/8" (600mm) high and up to 10 ft. (3050mm) long and provide a minimum surface area of 47.0 ft²/ft³ (154 m²/m³)
- 4) Modules shall have stiffening indentations (scallops), dedicated glue bosses and edge bonding to form a structurally rugged honeycomb and meet the structural loading requirements without any edge crimping or deformation of sheets at the design load.



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3. Installation

The fill modules shall be installed as per the recommendation of the fill manufacturer and in accordance with the engineer's specification, which shall include the following:

- A. The fill modules shall be carefully cut or trimmed to fit within 1/4 inches (or less) of any obstruction or sidewall to prevent air bypass.
- B. The fill shall be conveyed to the top of the tower by mechanical conveyor or crane. Cranes shall be used or conveyors shall be constructed as necessary to transport the fill to the working level inside the tower and the fill modules shall be moved by hand for final placement.
- C. The shaping, cutting and trimming of the fill modules may be done in the tower provided that precaution is taken by the contractor to prevent any chips, broken pieces, or debris from falling into the fill by using tarpaulins or similar protective materials to cover the fill modules. All fill modules shall be cleared of any such fallen material before a new layer of fill is added. The top layer of fill should also be completely protected from damage and falling material due to any subsequent work until the "start up" of the system.
- D. The fill module edges should be protected from damage due to workmen walking on them. To prevent such damage, the contractor shall use plywood or other suitable temporary planking.
- E. The fill modules shall be placed in the tower to provide the closest possible fit with adjacent modules without damaging the modules. The packing arrangement shall be as recommended by the fill manufacturer and shown on the installation drawings. Fill modules within each layer shall be installed such that the sheets of all modules are parallel to each other. Modules in respective layers shall be installed at right angles to the layer immediately below and above.
- F. The fill modules in the bottom layer shall be centered over the fill support system.