
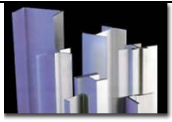


Cooling Tower Structures: FRP vs. Aluminum

Pultruded glass fiber reinforced structural shapes and plates have a number of significant advantages over aluminum extrusions. Pultrusions are electrically and thermally non-conductive, impact resistant highly corrosion resistant.

Is pultruded fiberglass the best material choice to meet the needs or requirements of your application? Features of both pultruded fiberglass structural shapes and aluminum extruded shapes are compared on a point-for-point basis below.

Concern	 FRP	 Aluminum
CORROSION RESISTANCE	Pultrusions are available in either polyester or vinyl ester resin for resistance to a broad range of chemicals. Surfacing veil and UV additives improve weatherability.	Can cause galvanic corrosion. Corrosion resistance can be increased through anodizing or other coatings.
WEIGHT	Very lightweight - about 70% the weight of aluminum on a density basis.	Lightweight - about 1/3 that of copper or steel.
ELECTRICAL CONDUCTIVITY	Non-conductive - high dielectric capability.	Conducts electricity - grounding potential
THERMAL CONDUCTIVITY	Insulates - low thermal conductivity, 4 (BTU/SF/HR/IN); low thermal coefficient of expansion 4.4 (IN/IN).	Heat conductor - high thermal conductivity. 150 (BTU/SF/HR/IN); thermal coefficient of expansion 11-13 (IN/IN).
STRENGTH	Ultimate flexural strength (Fu) LW = 30 ksi CW = 10 ksi. Pultruded fiberglass has 86% of the yield strength of aluminum and, pound-for-pounds, stronger than aluminum in the lengthwise direction.	Flexural strength (Fu) 35 ksi. Homogeneous material.
FINISHING AND COLOR	Pigments added to the resin provide color throughout the part. Special colors available. Composite design can be customized for required finishes.	Silver color. Other colors require prefinishes, anodic coatings and paints. Mechanical, chemical and electroplated finishes can be applied.
FABRICATION	Easy field fabrication with simple carpenter tools - utilizes adhesive bonding and/or mechanical joining. No torches or welding.	Good machinability - welding, brazing, soldering or mechanical joining.
COST	Slightly higher tooling costs; price per lineal foot marginally higher.	Extrusion tooling is relatively inexpensive. Part price comparable or slightly lower.

References: Pultrusion Industry Council