

# Filament-Wound Columns Process

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## ENGINEERING SPECIFICATIONS

In our filament winding process, glass fibers are wrapped in two directions: 90 and +/-45 degrees. This allows for maximum strength. After the shaft winding is complete and the column has undergone a curing cycle, North Pacific finishes its exterior to a smooth, paintable surface. Afterward, the column top receives the final detail for a specific capital configuration that the customer has requested. Fabrication of the decorative astragal (bead) for each column is produced using a high strength urethane-based foam product that resists cracking and weathering and is fully paintable. The astragal is molded directly onto the column neck and involves no bonding or gluing.

Materials Used: E-Glass Fiberglass  
Roving Polyester Resin

<b>Filament Wound Composite Mechanical Properties</b>	<b>Range</b>
• TENSILE STRENGTH . . . . .	35,000 – 50,000 psi
• TENSILE MODULUS . . . . .	2,500,000 – 3,600,000
• FLEXURAL STRENGTH . . . . .	30,000 – 50,000 psi
• FLEXURAL MODULUS . . . . .	2,500,000 – 3,600,000
• COMPRESSIVE STRENGTH . . . . .	30,000 – 45,000 psi
• WATER ABSORPTION . . . . .	0.5% (By wt.)
• BARCOL HARDNESS . . . . .	50
• THERMAL EXPANSION . . . . .	.000012 in / deg F
• FIBERGLASS TO RESIN RATIO (Min) . . . . .	60% / 40%

<b>Nominal Column Size</b>	<b>Average Wall Thickness (inches)</b>
10", 12", 14"	.125
16", 18"	.145
20", 22"	.160
24", 28"	.188
30", 36"	.220

The ultimate compressive strength for a 12" diameter column in wood and rotocast fiberglass is 8000 lb., while in a filament wound fiberglass column, it is 50,000 lb. Filament wound columns have the same basic characteristics as rotocast columns as far as weathering, insect resistance, etc., yet they are not as brittle. Due to the lightweight and high strength of these columns, crating is not required for shipping. The North Pacific Composites' column comes unfinished, requiring priming and painting per the individual contractor or homeowner's needs. As with all fiberglass columns, painting is required to eliminate UV degradation of the materials.