

CBT[®] 160 Resin in Composites

CBT 160 resin is a low melt viscosity thermoplastic polyester resin that can be processed in typical composite processes including pultrusion and compression molding. Through a reaction with the catalyst contained in CBT 160 resin, it is converted into the engineering thermoplastic polyester polybutylene terephthalate (PBT). Due to its unique properties and processing advantages, Cyclics CBT resin is revolutionizing the composites industry for applications that require light weight, high service temperatures, excellent chemical resistance, high impact resistance, and improved fatigue. CBT-based glass and carbon fiber composites are used in the demanding applications of wind power, construction, marine, automotive, aerospace, and sports. CBT 160 is available in pellet or powder form.



Advantages

- Superior fiber wet-out is achieved more rapidly without the need for high pressure.
- Productivity and performance is increased in common composite manufacturing processes.
- No heat is released during reaction (polymerization). Isothermal processing is possible.
- Final product is PBT thermoplastic enabling postprocessing treatments such as thermoforming, compression molding, and filament winding.
- End product has lower void content and enables higher fiber loading for a better quality composite.

Physical property values of CBT 160 with 50 vol% carbon fiber

Property	Value Metric (Imperial)	Test Method
Mechanical		
0° — Tensile Modulus Tensile Strength	153 GPa (2.22 x 10 ⁷ psi) 1416 MPa (2.05 x 10 ⁵ psi)	ASTM D3039
0° — Flexural Strength	783 MPa (1.14 x 10 ⁵ psi)	ASTM D790
0° — Compression Modulus 0° — Compression Strength	102 GPa (1.48 x 10 ⁷ psi) 521 MPa (7.56 x 10 ⁴ psi)	ASTM 695
90° — Tensile Modulus 90° — Tensile Strength	8.6 GPa (1.25 x 10 ⁶ psi) 43 MPa (6.24 x 10 ³ psi)	ASTM D3039
90° — Compression Modulus 90° — Compression Strength	7.9 GPa (1.15 x 10 ⁶ psi) 42 MPa (2.22 x 10 ⁷ psi)	ASTM 695
In-Plane Shear Modulus Shear Strength	6.6 GPa (9.58 x 10 ⁵ psi) 126 MPa (1.83 x 10 ⁴ psi)	ASTM D3518 ± 45 Tension
Out-of-Plane Shear (IZ)	6.6 GPa (9.58 x 10 ⁵ psi)	ASTM 2344 (short beam)
Physical		
Density	1.6 g/cm ³ (99.9 lb/ft ³)	ASTM D792

Composite property values CBT 160 with chopped glass fiber (45% weight or 30% volume)

Property	Value Metric (Imperial)	Test Method
Mechanical		
Tensile Strength	220 MPa (3.19 x 10 ⁴ psi)	ASTM D638
Tensile Modulus	9.65 GPa (1.40 x 10 ⁶ psi)	ASTM D638
Flexural Strength	310 MPa (4.50 x 10 ⁴ psi)	ASTM D790
Flexural Modulus	10.0 GPa (1.45 x 10 ⁶ psi)	ASTM D790
Notched Izod Impact at +23°C (73°F)	19 ft-lb/in	ASTM 256
Thermal		
HDT at 1.8 MPa (264 psi)	215°C (419°F)	ISO75
Physical		
Density	1.68 g/cm ³ (104.9 lb/ft ³)	ASTM D792
Flammability		
Flame rating at 0.76mm (0.03")	HB (HB)	UL94

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