

PRODUCT DATA SHEET

DESCRIPTION

Toray Cetex® TC1320 is a high-end thermoplastic composite material, utilizing the semi-crystalline thermoplastic polymer PEKK for excellent elevated service performance.

Qualified for use in aerostructures, this material has a proven applicability in aerospace. Toray Cetex® TC1320 offers outstanding mechanical performance and good hot/wet strength. The semi-crystalline nature of the resin ensures an excellent resistance to chemicals and solvents, and an equally superior performance in flammability properties.

Toray Cetex® TC1320 is available as a UD tape, a fabric prepreg, and as reinforced thermoplastic laminates (RTLs) of varying thicknesses. RTLs can be equipped with lightning strike protection, and carbon reinforced RTLs can be supplied with a thin glass top layer to protect a partly metallic assembly against galvanic corrosion. Glass scrim is also applicable in structures made from UD tape.

FEATURES

- ▶ Qualified and certified to aerospace OEM specifications
- ▶ Excellent toughness and impact resistance
- ▶ Excellent mechanical performance, also at elevated temperatures
- ▶ Low moisture uptake for good hot/wet strength retention
- ▶ Inherently flame retardant
- ▶ Outstanding chemical and solvent resistance
- ▶ Indefinite shelf life at ambient temperature storage

PRODUCT TYPE

PEKK (PolyEtherKetoneKetone) Thermoplastic Resin System

TYPICAL APPLICATIONS

- ▶ Primary and secondary aircraft structures
- ▶ High load aircraft interiors applications
- ▶ Access panels, rib stiffeners, brackets, conduit, flooring

TYPICAL NEAT RESIN PROPERTIES

Density (specific gravity)	1.30 g/cm ³ (80.5 lb/ft ³)
T _g (glass transition)	160°C (320°F)
T _m (melt)	337°C (639°F)
T _c (crystallinity)	265°C (509°F)
T _p (processing)	370–400°C (700–750°F)

SHELF LIFE

Out Life:	Indefinite at ambient temperature storage
Frozen Storage Life:	Not applicable—product does not require freezing



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Cetex®

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PHYSICAL PROPERTIES

Property	Standard Modulus Carbon UD Tape
Fiber areal weight (FAW)	145 g/m ² (4.28 oz/yd ²)
Weight per ply (PAW)	221 g/m ² (6.52 oz/yd ²)
Resin content by weight (RC)	34%
Consolidated ply thickness (CPT)	0.14 mm (0.006")
Density	1.59 g/cm ³ (99.3 lb/ft ³)
Width	305 mm (12")*

*Narrower widths are available through secondary slitting
For the availability of other reinforcements, please contact Toray Advanced Composites

MECHANICAL PROPERTIES

Standard Modulus Carbon 145gsm UD Tape 45% RC				
Property	Condition	Test Method	Results	
Tensile Strength 0°	RTD	ASTM D 3039	2410 MPa	350 ksi
Tensile Modulus 0°	RTD	ASTM D 3039	135 GPa	19.5 Msi
Tensile Strength 90°	RTD	ASTM D 3039	86 MPa	12.5 ksi
Tensile Modulus 90°	RTD	ASTM D 3039	10 GPa	1.4 Msi
Compression Strength 0°	RTD	ASTM D 6641	1300 MPa	189 ksi
Compression Modulus 0°	RTD	ASTM D 6641	124 GPa	18 Msi
Compression Strength 0°	ETD	ASTM D 6641	1222 MPa	177 ksi
Compression Modulus 0°	ETD	ASTM D 6641	124 GPa	18 Msi
In-Plane Shear Strength	RTD	ASTM D 3518	152 MPa	22 ksi
In-Plane Shear Strength 2% Offset	RTD	ASTM D 3518	50.5 MPa	7.3 ksi
In-Plane Shear Modulus	RTD	ASTM D 3518	5.2 GPa	0.75 Msi
Flexural Strength 90°	RTD	ASTM D 790	152 MPa	22 ksi
Interlaminar Shear Strength (SBS) 0°/90°	RTD	ASTM D 2344	96.5 MPa	14 ksi

Fiber type AS-4D
ETD is 121°C (250°F)
CTD is 18°C (65°F)
ETW is 60°C (140°F), after 85% relative humidity until saturation, soaked at 71°C (160°F)
Laminate T_g by DMA is 160°C (320°F)

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Standard Modulus Carbon 145gsm UD Tape 45% RC				
Property	Condition	Test Method	Results	
Open-Hole Tensile Strength	RTD	ASTM D 5766	420 MPa	61 ksi
Open-Hole Tensile Strength	CTD	ASTM D 5766	422 MPa	61 ksi
Open-Hole Tensile Strength	ETW	ASTM D 5766	410 MPa	60 ksi
Open-Hole Compression Strength	RTD	ASTM D 6484	331 MPa	48 ksi
Open-Hole Compression Strength	ETD	ASTM D 6484	282 MPa	41 ksi
Open-Hole Compression Strength	ETW	ASTM D 6484	268 MPa	39 ksi
Compression After Impact Strength 30.5 J (270 in/lb) Impact Energy	RTD	ASTM D 7136/7137	303 MPa	44 ksi
Mode I Interlaminar Fracture Toughness (G _{IC} Strain Energy Release Rate)	RTD	ASTM D 5528	1.6 kJ/m ²	9.0 in-lb/in ²
Mode II Interlaminar Fracture Toughness (G _{IIc} Strain Energy Release Rate)	RTD	ASTM D 7905	2.3 kJ/m ²	13.0 in-lb/in ²
Fiber type AS-4D ETD is 121°C (250°F) CTD is 18°C (65°F) ETW is 60°C (140°F), after 85% relative humidity until saturation, soaked at 71°C (160°F) Laminate T _g by DMA is 160°C (320°F)				

HEALTH & SAFETY

Health and safety information on handling and processing Toray composite materials is described in the Safety Data Sheet available from Toray Advanced Composites. To obtain this or any other information about Toray Cetex® PEKK thermoplastic composite materials, please contact Toray Advanced Composites.

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