

PRODUCT DATA SHEET

DESCRIPTION

Toray Cetex® TC1220 is a high-end thermoplastic composite material, utilizing a semi-crystalline thermoplastic PEEK polymer that provides the composite improved toughness.

The distinctive value of Toray Cetex® TC1220 over other composites with a PAEK family matrix is an elevated Compression After Impact strength. As a composite material it offers outstanding mechanical performance, from cold to elevated temperatures. 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® TC1220 is offered in Toray's highly consolidated UD tape format with a consistent fiber and resin distribution.

FEATURES

- ▶ Outstanding toughness and Compression After Impact (CAI) resistance of 345 MPa (50 ksi)
- ▶ Excellent mechanical performance, also at elevated temperatures
- ▶ Low moisture uptake for good hot/wet strength retention
- ▶ Fully impregnated low void content unidirectional tapes for robust processing
- ▶ Inherently flame retardant
- ▶ Outstanding chemical and solvent resistance
- ▶ Indefinite shelf life at ambient temperature storage

PRODUCT TYPE

PEEK (PolyEtherEtherKetone) Thermoplastic Resin System

TYPICAL APPLICATIONS

- ▶ Primary and secondary aircraft structure
- ▶ Access panels, rib stiffeners, brackets, conduit, flooring

SHELF LIFE

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

TYPICAL NEAT RESIN PROPERTIES

Density (specific gravity)	1.30 g/cm ³ (81.2 lb/ft ³)
T _g (glass transition)	143°C (289°F)
T _m (melt)	343°C (649°F)
T _c (crystallinity)	290°C (554°F)
T _p (processing)	370–400°C (700–750°F)



Contact us for more information:

North America/Asia/Pacific

e explore@toraytac-usa.com

t +1 408 465 8500

Europe/Middle East/Africa

e explore@toraytac-europe.com

t +31 (0) 548 633 933

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 (0.005")
Density	1.59 g/cm ³ (99.3 lb/ft ³)

MECHANICAL PROPERTIES

Standard Modulus Carbon 145gsm FAW UD 34% RC				
Property	Condition	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
Compressive Strength 0°	RTD	ASTM D 6641	1300 MPa	189 ksi
Compressive Modulus 0°	RTD	ASTM D 6641	124 GPa	18 Msi
In-Plane Shear Strength (±45° Tension)	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 (±45° Tension)	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
Open-Hole Tensile Strength	RTD	ASTM D 5766	420 MPa	61 ksi
Open-Hole Compressive Strength	RTD	ASTM D 6468	317 MPa	46 ksi
Compression After Impact Strength 30.5 J (270 in/lb) Impact Energy	RTD	ASTM D 7137	345 MPa	50 ksi
Mode I Interlaminar Fracture Toughness (G _{Ic} Strain Energy Release Rate)	RTD	ASTM D 5528	2.0 kJ/m ²	11.3 lb/in
Mode II Interlaminar Fracture Toughness (G _{IIc} Strain Energy Release Rate)	RTD	ASTM D 7905	2.6 kJ/m ²	15.0 lb/in

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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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® PEEK thermoplastic composite materials, contact Toray Advanced Composites.

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Toray Advanced Composites

18255 Sutter Blvd.
Morgan Hill, CA 95037, USA
t +1 408 465 8500

G. van der Muelenweg 2
7443 RE Nijverdal, The Netherlands
t +31 (0) 548 633 933



www.toraytac.com
explore@toraytac-usa.com (North America/Asia/Pacific)
explore@toraytac-europe.com (Europe/Middle East/Africa)