

## PRODUCT DATA SHEET

### DESCRIPTION

Toray E750 is a toughened epoxy component prepreg developed for structural applications within Formula 1 and high performance automotive. Toray E750 allows curing from 80°C (176°F) to 180°C (356°F) and can be impregnated into a range of fiber and fabric types.

Toray E750 is compatible for co-cure with a range of Toray MicroPly™ film adhesive and syntactic core products.

### FEATURES

- ▶ Versatile cure schedules 80°C (176°F) to 180°C (356°F)
- ▶ Excellent translation of fiber properties
- ▶ Good impact resistance
- ▶ Excellent retention of properties at 120°C (248°F)
- ▶ Controlled flow
- ▶ Good drape and tack
- ▶ 60 days out life at 18°C (64°F)
- ▶ 12 months storage life at -18°C (0°F)

### PRODUCT TYPE

80°C (176°F) to 180°C (356°F) Cure Versatile Temperature Curing Toughened Epoxy Component Prepreg

### TYPICAL APPLICATIONS

- ▶ Structural applications within Formula 1 and high performance automotive

### SHELF LIFE

Out Life:	60 days at 18°C (64°F)
Storage Life:	12 months at -18°C (0°F)

Out life is the maximum time allowed at room temperature before cure.

#### To avoid moisture condensation

Following removal from cold storage, allow the prepreg to reach room temperature before opening the polythene bag. Typically, the thaw time for a full roll of material will be 4 to 6 hours.

### TYPICAL NEAT RESIN PROPERTIES

Density	1.23 g/cm <sup>3</sup> (76.8 lbs/ft <sup>3</sup> )
T <sub>g</sub> (DMTA) after 1 hr at 135°C (275°F)	Onset: 148°C (298.4°F); Peak tan δ: 185°C (365°F)



Contact us for more information:

**North America/Asia/Pacific**

**e** [explore@toraytac-usa.com](mailto:explore@toraytac-usa.com)

**t** +1 408 465 8500

**Europe/Middle East/Africa**

**e** [explore@toraytac-europe.com](mailto:explore@toraytac-europe.com)

**t** +44 (0)1773 530899

## PRODUCT DATA SHEET

### MECHANICAL PROPERTIES

Intermediate Modulus T800 6K Carbon 200gsm 2x2 Twill 42% RC			
Property	Method	Laminate Test Condition	
		RTD	ETD
Tensile Strength 0°	ISO 527-4	1079 MPa	1126 MPa
Tensile Modulus 0°	ISO 527-4	78.6 GPa	75.1 GPa
Poisson's Ratio 0°	ISO 527-4	0.04*	
Tensile Strength 90°	ISO 527-4	993 MPa	999 MPa
Tensile Modulus 90°	ISO 527-4	76.9 GPa	76.7 GPa
Poisson's Ratio 90°	ISO 527-4	0.04*	0.05*
Compression Strength 0°	prEN 2580	777 MPa	637 MPa
Compression Modulus 0°	prEN 2580	66.3 GPa	66.7 GPa
Compression Strength 90°	prEN 2580	758 MPa	622 MPa
Compression Modulus 90°	prEN 2580	67.4 GPa	67.4 GPa
In-Plane Shear Strength	prEN 6031	122 MPa*	92 MPa*
In-Plane Shear Modulus	prEN 6031	4.33 GPa*	3.34 GPa*
Poisson's Ratio ± 45°	prEN 6031	0.80*	
Interlaminar Shear Strength 0°	ASTM D 2344	76.8 MPa*	47.9 MPa*
Mode I Interlaminar Fracture Toughness (G <sub>IC</sub> Strain Energy Release Rate)	prEN 6033	525 J/m <sup>2</sup> *	-

Cured 1 hr at 135°C (275°F)  
 Room Temperature Dry (RTD) 22°C (71.6°F); Elevated Temperature Dry (ETD) 120°C (248°F); Test results normalized (55% Vf) except \* actual data (52.93% Vf)

## PRODUCT DATA SHEET

Intermediate Modulus T1000 12K Carbon 280gsm 5HS 42% RC			
Property	Method	Laminate Test Condition	
		RTD	ETD
Tensile Strength 0°	ISO 527-4	1243 MPa	1302 MPa
Tensile Modulus 0°	ISO 527-4	77.2 GPa	75.6 GPa
Poisson's Ratio 0°	ISO 527-4	0.06*	0.05*
Tensile Strength 90°	ISO 527-4	1331 MPa	1269 MPa
Tensile Modulus 90°	ISO 527-4	77.7 GPa	75.9 GPa
Poisson's Ratio 90°	ISO 527-4	0.05*	0.06*
Compression Strength 0°	prEN 2580	664 MPa	548 MPa
Compression Modulus 0°	prEN 2580	70.6 GPa	68.2 GPa
Compression Strength 90°	prEN 2580	703 MPa	588 MPa
Compression Modulus 90°	prEN 2580	72.1 GPa	68.6 GPa
In-Plane Shear Strength	prEN 6031	113 MPa*	84 MPa*
In-Plane Shear Modulus	prEN 6031	4.30 GPa*	3.09 GPa*
Poisson's Ratio ± 45°	prEN 6031	0.8*	
Interlaminar Shear Strength 0°	ASTM D 2344	67.7 MPa*	47.3 MPa*
Mode I Interlaminar Fracture Toughness (G <sub>IC</sub> Strain Energy Release Rate)	prEN 6033	696 J/m <sup>2</sup> *	-

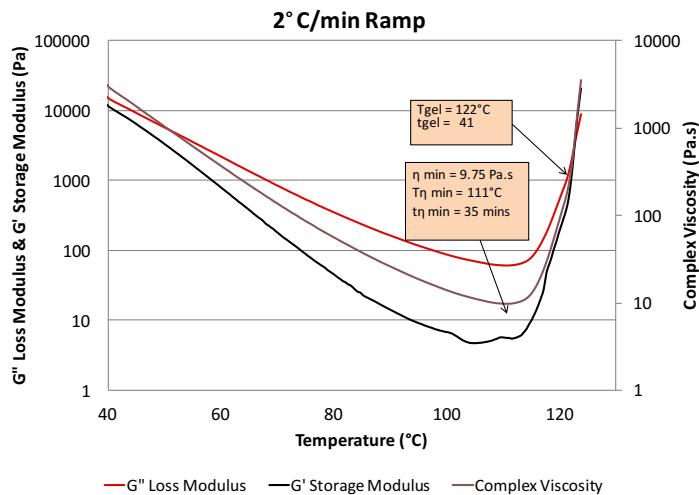
Cured 1 hr at 135°C (275°F)  
 Room Temperature Dry (RTD) 22°C (71.6°F); Elevated Temperature Dry (ETD) 120°C (248°F); Test results normalized (55% Vf) except \* actual data (51.63% Vf)

## PRODUCT DATA SHEET

High Modulus M46J 6K Carbon 200gsm 2x2 Twill 42% RC			
Property	Method	Laminate Test Condition	
		RTD	ETD
Tensile Strength 0°	ISO 527-4	661 MPa	868 MPa
Tensile Modulus 0°	ISO 527-4	113.8 GPa	114.1 GPa
Poisson's Ratio 0°	ISO 527-4	0.03*	
Tensile Strength 90°	ISO 527-4	631 MPa	824 MPa
Tensile Modulus 90°	ISO 527-4	112.7 GPa	111.4 GPa
Poisson's Ratio 90°	ISO 527-4	0.02*	0.04*
Compression Strength 0°	prEN 2580	494 MPa	492 MPa
Compression Modulus 0°	prEN 2580	95.8 GPa	95.8 GPa
Compression Strength 90°	prEN 2580	505 MPa	470 MPa
Compression Modulus 90°	prEN 2580	96.4 GPa	96.4 GPa
In-Plane Shear Strength	prEN 6031	90 MPa*	71 MPa*
In-Plane Shear Modulus	prEN 6031	4.43 GPa*	3.4 GPa*
Poisson's Ratio	prEN 6031	0.9*	
Interlaminar Shear Strength 0°	ASTM D 2344	63.0 MPa*	41.5 MPa*
Mode I Interlaminar Fracture Toughness (G <sub>IC</sub> Strain Energy Release Rate)	prEN 6033	471 J/m <sup>2</sup> *	-

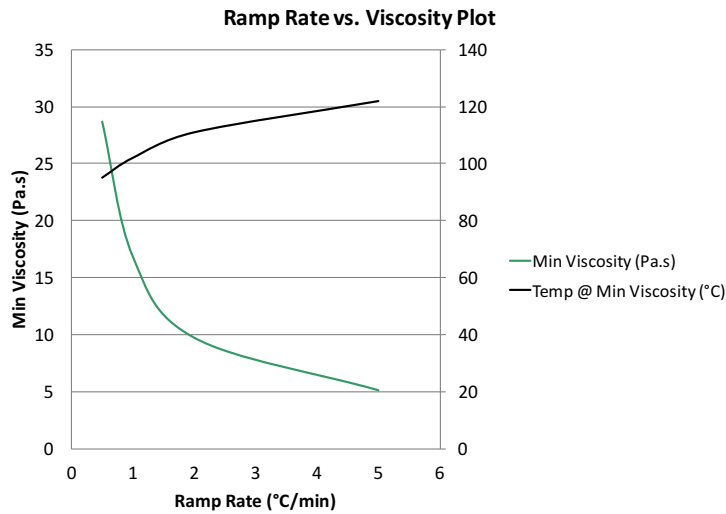
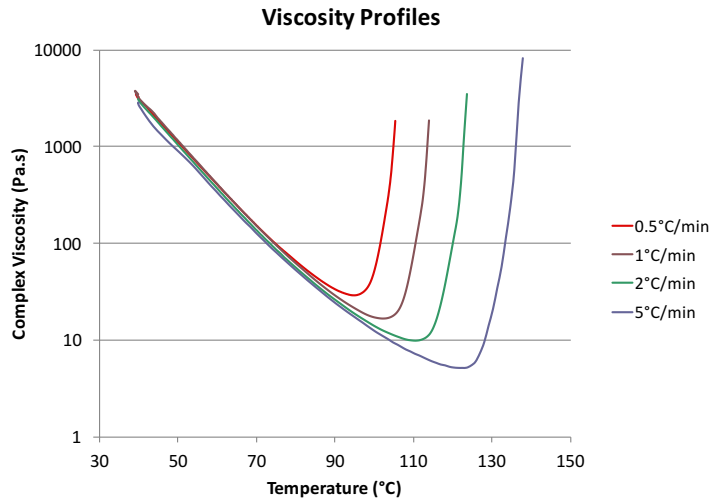
Cured 1 hr at 135°C (275°F)  
 Room Temperature Dry (RTD) 22°C (71.6°F)  
 Elevated Temperature Dry (ETD) 120°C (248°F);  
 Test results normalized (55% Vf) except \* actual data (53.18% Vf)

## RHEOLOGY



## PRODUCT DATA SHEET

### VISCOSITY



### CURE PROPERTIES: VISCOSITY PROFILE 30°C TO 150°C

Ramp rate [°C (°F)/min]	Minimum Viscosity (Pa.s)	Temperature at Minimum Viscosity
0.5 (0.9)	28.73	95°C (203°F)
1.0 (1.8)	16.87	102°C (216°F)
2.0 (3.6)	9.75	111°C (231°F)
5.0 (9.0)	5.14	122°C (251°F)

## PRODUCT DATA SHEET

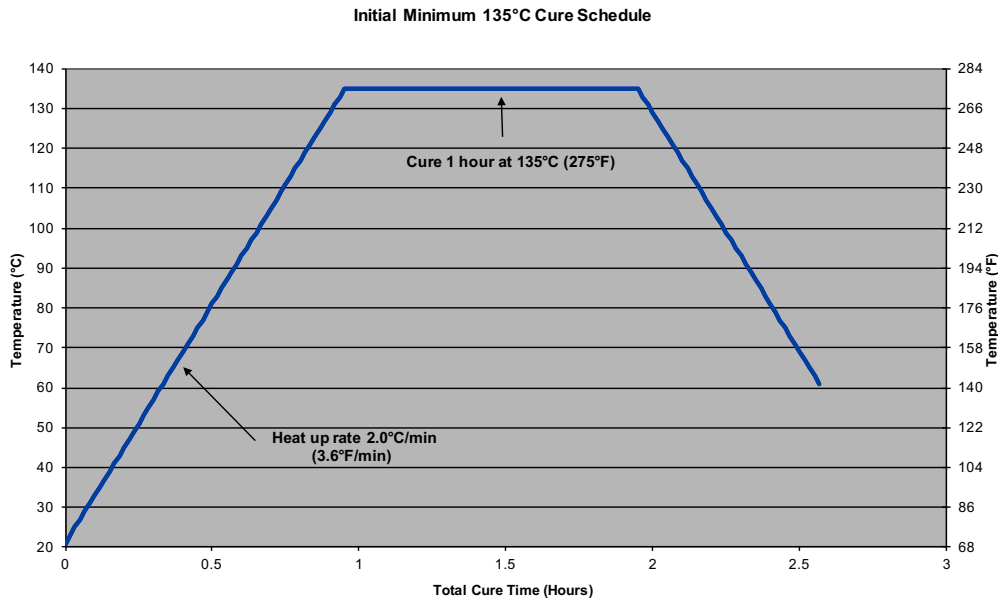
### TYPICAL CURE PROFILES

135°C (275°F) Cure Temperatures		
Ramp	2.0°C (3.6°F)/min to 135°C (275°F)	Dwell for 1 hour
Cool	2.0°C (3.6°F)/min to below 60°C (140°F)	Followed by demold
<b>Total time: 2 hours 35 minutes</b>		

### INITIAL MINIMUM CURE TIMES

Cure Cycle	T <sub>g</sub> Onset (°C)	T <sub>g</sub> Peak tan δ (°C)
16 hours at 80°C (176°F)	102°C	120°C
4 hours at 100°C (212°F)	119°C	148°C
1 hour at 135°C (275°F)	148°C	185°C
30 minutes at 150°C (302°F)	158°C	186°C
1 hour at 135°C (275°F) plus 2 hours at 180°C (356°F)	173°C	195°C

### CURE SCHEDULE



## PRODUCT DATA SHEET

### EXOTHERM

In certain circumstances, such as the production of thick section laminates rapid heat-up rates or highly insulating masters, Toray E750 can undergo exothermic heating leading to rapid temperature rise and component degradation in extreme cases. Where this is likely, a cure incorporating an intermediate dwell is recommended in order to minimize the risk.

### HANDLING SAFETY

Observe established precautions for handling epoxy resins and fibrous materials—wear gloves. For further information, refer to the Safety Data Sheet.

### PROCESSING

Following removal from refrigerated storage, allow the prepreg to reach room temperature before opening the polythene bag, to avoid moisture condensation. Typically, the thaw time for a full roll of material will be 4 to 6 hours. Cut patterns to size and lay-up the laminate in line with design instructions taking care not to distort the prepreg. If necessary, the tack of the prepreg may be increased by gentle warming with hot air. The lay-up should be vacuum debulked at regular intervals using a P3 (pinpricked) release film on the prepreg surface; a vacuum of 980 mbar (29 inHg) is applied for 20 minutes.

For autoclave cures, use of a nonperforated release film on the prepreg surface trimmed to within 25–30 mm of the prepreg edge is recommended for the cure cycle and a vacuum bag should be installed using standard techniques.

E750\_PDS\_v6.0\_2021-02-04 Page 7/7

© 2019–2021 Toray Advanced Composites. All data given is based on representative samples of the materials in question. Since the method and circumstances under which these materials are processed and tested are key to their performance, and Toray Advanced Composites has no assurance of how its customers will use the material, the corporation cannot guarantee these properties. Toray®, (Toray) AmberTool®, (Toray) Cetex®, (Toray) MicroPly™, and all other related characters, logos, and trade names are claims and/or registered trademarks of Toray Industries Inc. and/or its subsidiary companies in one or more countries. Use of trademarks, trade names, and other IP rights of Toray Industries Inc. without prior written approval by such is strictly prohibited.