

## 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.

### 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

### TYPICAL LAMINATE PROPERTIES

Intermediate Modulus T800 6K Carbon 200gsm 2x2 Twill 42% RC			
Property	Method	Test Temperature	
		RT	120°C (248°F)
Tensile Strength 0°	ISO 527-4	1038 MPa	1084
Tensile Modulus 0°	ISO 527-4	75.6 GPa	72.3
Tensile Strength 90°	ISO 527-4	1056 MPa	961
Tensile Modulus 90°	ISO 527-4	74 GPa	73.8
Poisson's Ratio	ISO 527-4	0.05	
Compression Strength 0°	prEN 2580	748 MPa	613
Compression Modulus 0°	prEN 2580	63.8 GPa	64.2
Compression Strength 90°	prEN 2580	729 MPa	599
Compression Modulus 90°	prEN 2580	64.9 GPa	64.9
In-Plane Shear Strength	prEN 6031	122 MPa	91.8
In-Plane Shear Modulus	prEN 6031	4.33 GPa	3.34
Poisson's Ratio	prEN 6031	0.8	
Interlaminar Shear Strength 0°	ASTM D 2344	76.8 MPa	47.9
Mode I Interlaminar Fracture Toughness (G <sub>IC</sub> Strain Energy Release Rate)	prEN 6033	525	
Cured 1 hr at 135°C (275°F)			

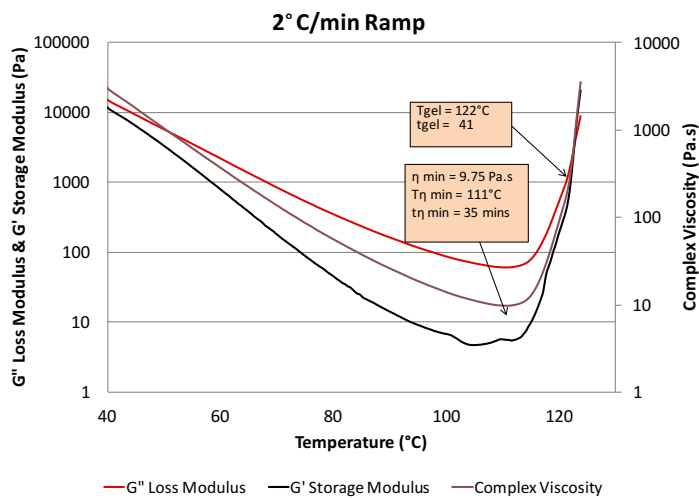
Intermediate Modulus T1000 12K Carbon 285gsm 5HS 42% RC			
Property	Method	Test Temperature	
		RT	120°C (248°F)
Tensile Strength 0°	ISO 527-4	1167 MPa	1232
Tensile Modulus 0°	ISO 527-4	72.5 GPa	69.5
Tensile Strength 90°	ISO 527-4	1249 MPa	1191
Tensile Modulus 90°	ISO 527-4	72.9 GPa	71.2
Poisson's Ratio	ISO 527-4	0.05	
Compression Strength 0°	prEN 2580	623 MPa	514
Compression Modulus 0°	prEN 2580	66.3 GPa	64
Compression Strength 90°	prEN 2580	660 MPa	552
Compression Modulus 90°	prEN 2580	67.7 GPa	64.4
In-Plane Shear Strength	prEN 6031	113 MPa	84
In-Plane Shear Modulus	prEN 6031	4.3 GPa	3.1
Poisson's Ratio	prEN 6031	0.82	0.8
Interlaminar Shear Strength 0°	ASTM D 2344	67.7 MPa	47.3
Mode I Interlaminar Fracture Toughness (G <sub>IC</sub> Strain Energy Release Rate)	prEN 6033	696	
Cured 1 hr at 135°C (275°F)			

## PRODUCT DATA SHEET

High Modulus M46J 6K Carbon 200gsm 2x2 Twill 42% RC			
Property	Method	Test Temperature	
		RT	120°C (248°F)
Tensile Strength 0°	ISO 527-4	639 MPa	839
Tensile Modulus 0°	ISO 527-4	110 GPa	110.3
Tensile Strength 90°	ISO 527-4	610 MPa	797
Tensile Modulus 90°	ISO 527-4	109 GPa	107.7
Poisson's Ratio	ISO 527-4	0.03	
Compression Strength 0°	prEN 2580	478 MPa	476
Compression Modulus 0°	prEN 2580	92.6 GPa	92.6
Compression Strength 90°	prEN 2580	488 MPa	454
Compression Modulus 90°	prEN 2580	93.2 GPa	93.2
In-Plane Shear Strength	prEN 6031	90 MPa	71
In-Plane Shear Modulus	prEN 6031	4.43 GPa	3.4
Poisson's Ratio	prEN 6031	0.09	
Interlaminar Shear Strength 0°	ASTM D 2344	63.0 MPa	41.5
Mode I Interlaminar Fracture Toughness (G <sub>IC</sub> Strain Energy Release Rate)	prEN 6033	471	

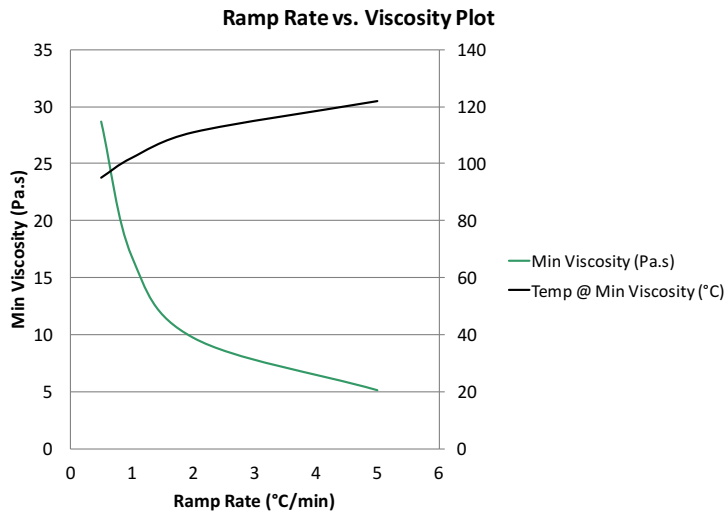
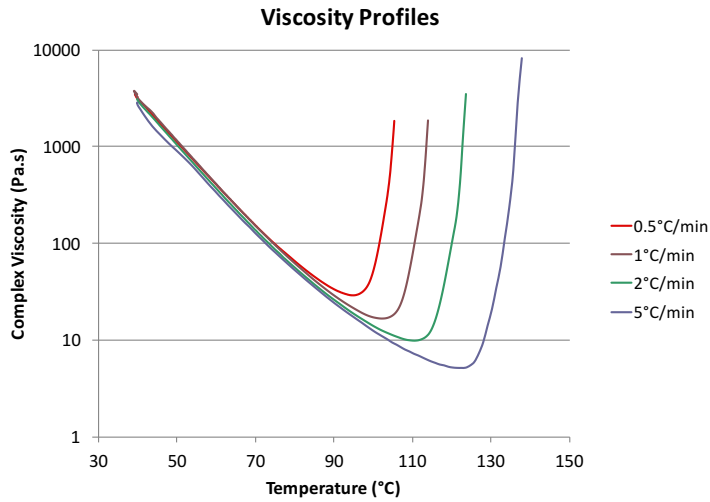
Cured 1 hr at 135°C (275°F)

## 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

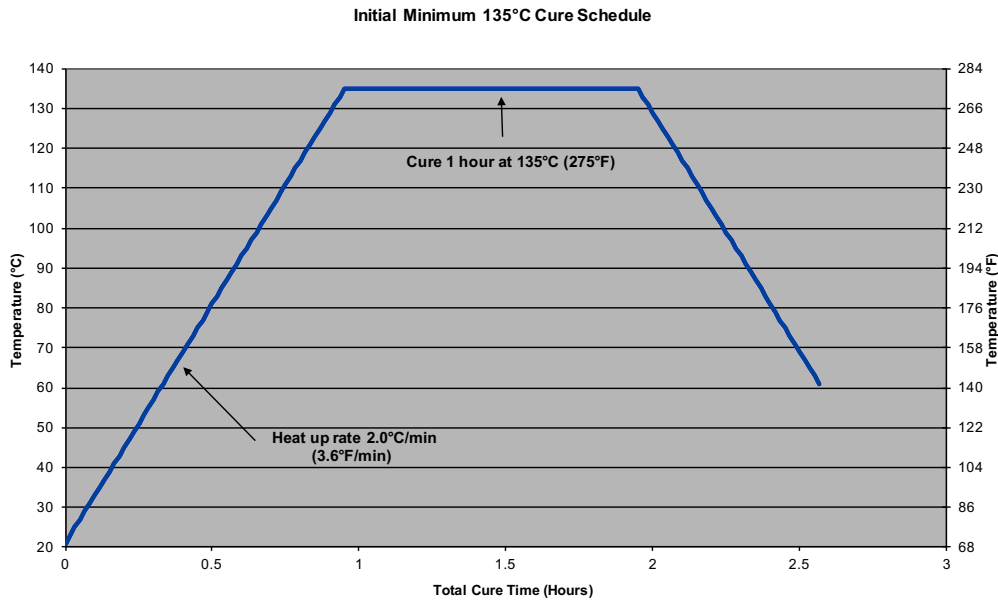
### TYPICAL CURE PROFILES

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 Material 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 (pin pricked) release film on the prepreg surface; vacuum of 980 mbar (29 in Hg) 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.