

PRODUCT DATA SHEET

DESCRIPTION

Toray E731 is a toughened epoxy resin system designed to deliver enhanced resin clarity for cosmetic components within high performance automotive. The resin formulation ensures that components are free from white-spots and exhibit high clarity.

FEATURES

- ▶ Enhanced resin clarity—“white-spot” free
- ▶ Toughened system—good mechanical properties
- ▶ Controlled tack allows easy repositioning
- ▶ Medium temperature cures—100°C (212°F) to 125°C (257°F)
- ▶ T_g (DMTA onset) of 140°C (284°F) after 1 hour at 125°C autoclave cure
- ▶ 14 days out life at 18°C (64°F)
- ▶ 6 months storage life at -18°C (0°F)

PRODUCT TYPE

100°C (212°F) to 125°C (257°F) Cure

Cosmetic High Clarity Toughened Epoxy Component Prepreg

TYPICAL NEAT RESIN PROPERTIES

Density	1.24 g/cm ³ (77.4 lbs/ft ³)
T _g (DMTA) after 1 hr at 125°C (257°F)	Onset: 140°C (284°F); Peak tan δ: 160°C (320°F)

TYPICAL APPLICATIONS

- ▶ Cosmetic and high clarity components
- ▶ Door panels, centre console, dashboard

KEY PROPERTIES

- ▶ Resin clarity
- ▶ Drapeable

SHELF LIFE

Out Life: 14 days at 18°C (64°F)

Storage Life: 6 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.



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 +44 (0)1773 530899

PRODUCT DATA SHEET

TYPICAL LAMINATE PROPERTIES

E731-00 HS2238 Carbon TR30S T 245gsm 2 x 2 Twill 3K 42% RC		
Property	Method	Test Temperature RT
Tensile Strength 0°	ISO 527-4	705 MPa
Tensile Modulus 0°	ISO 527-4	55.9 GPa
Tensile Strength 90°	ISO 527-4	662 MPa
Tensile Modulus 90°	ISO 527-4	57.7 GPa
Poisson's Ratio	ISO 527-4	0.05
Compression Strength 0°	prEN 2850	643 MPa
Compression Modulus 0°	prEN 2850	49.8 GPa
Compression Strength 90°	prEN 2850	664 MPa
Compression Modulus 90°	prEN 2850	49.7 GPa
In-Plane Shear Strength	prEN 6031	119 MPa
In-Plane Shear Modulus	prEN 6031	4.07 GPa
Poisson's Ratio	prEN 6031	0.8
Interlaminar Shear Strength 0°	ASTM D 2344	63.9 MPa
Interlaminar Shear Strength 90°	ASTM D 2344	61.8 MPa
Mode I Interlaminar Fracture Toughness (G _{IC} Strain Energy Release Rate)	prEN 6033	318

Cured 1 hr at 125°C (257°F)

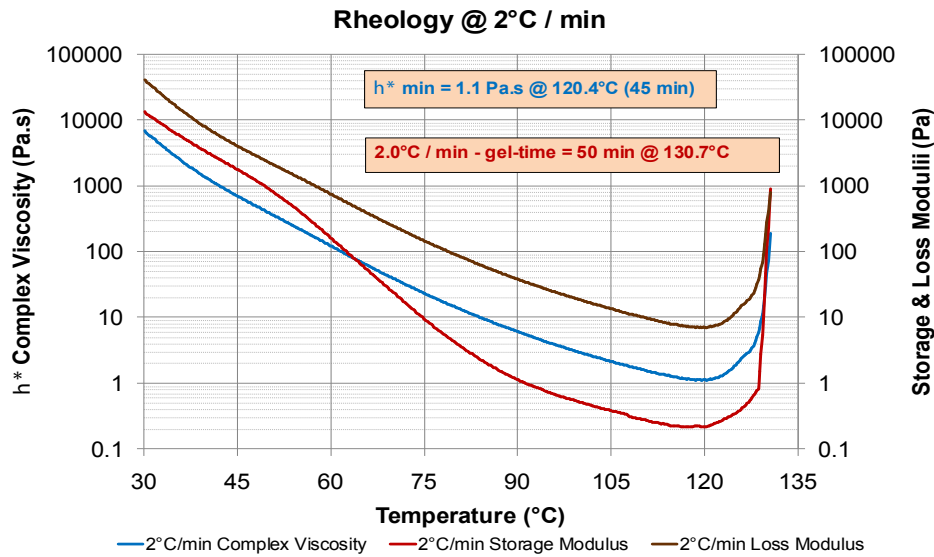
REINFORCEMENTS AVAILABLE

Fiber Type	Weight (gsm)	Weave Style	Standard Resin Content w/o
Standard modulus 3K carbon	245	2 x 2 twill	42 (surface ply)
Standard modulus 6K carbon	400	2 x 2 twill	37 (bulk ply)
Standard modulus 12K carbon	650	2 x 2 twill	32 (heavier bulk ply)

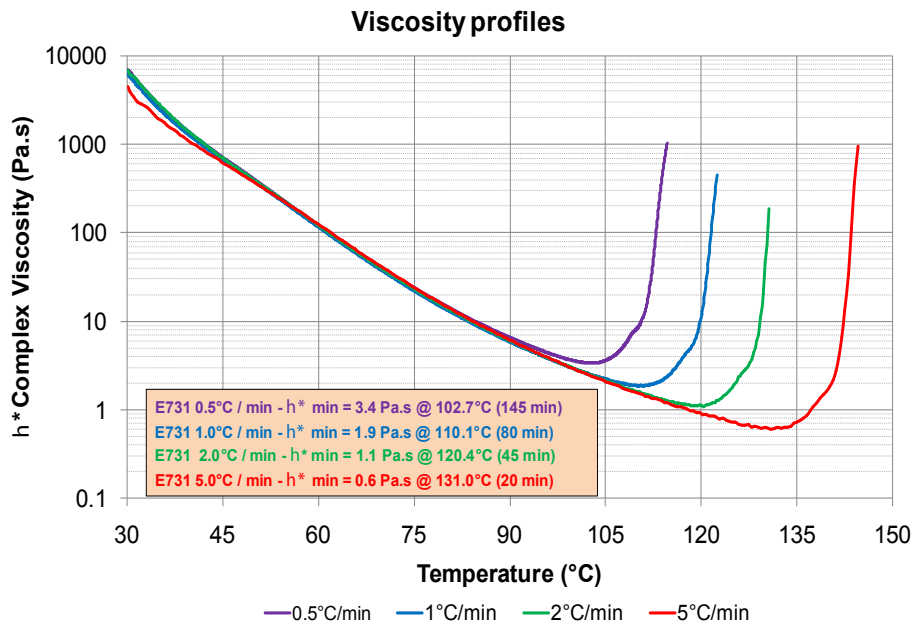
Prepreg width is 1.25m; Other fabrics and resin weights available on request

PRODUCT DATA SHEET

RHEOLOGY



VISCOSITY



INITIAL MINIMUM CURE TIMES

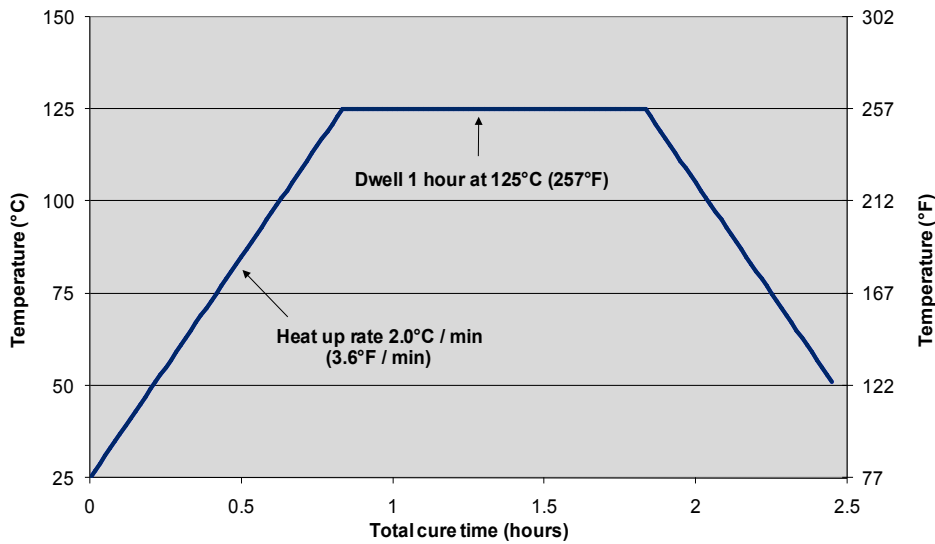
Temperature	Time (hrs)
100°C (212°F)	4
110°C (230°F)	2
125°C (257°F)	1

PRODUCT DATA SHEET

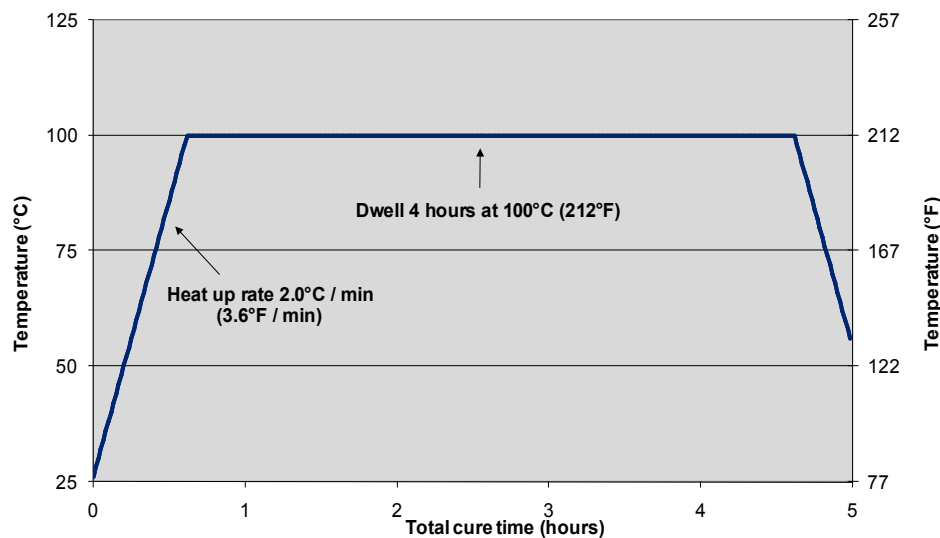
TYPICAL CURE PROFILES

125°C (257°F) Cure Temperatures		
Ramp	2.0°C (3.6°F)/min to 125°C (257°F)	Dwell for 1 hour
Ramp	2.0°C (3.6°F)/min to 50°C (122°F)	Followed by demold
Total time: 2 hours 30 minutes		
100°C (212°F) Cure Temperatures		
Ramp	2.0°C (3.6°F)/min to 100°C (212°F)	Dwell for 4 hours
Ramp	2.0°C (3.6°F)/min to 50°C (122°F)	Followed by demold
Total time: 5 hours		

INITIAL MINIMUM 125°C CURE SCHEDULE



INITIAL MINIMUM -100°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 E731 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 of 1 hour at 90°C (194°F) 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 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.