

PRODUCT DATA SHEET

DESCRIPTION

Toray E720 is a 120°C (248°F) cure toughened epoxy prepreg. E720 offers excellent adhesive properties, allowing direct lamination to honeycomb without the use of a film adhesive. E720 is designed for structural applications in motorsport and marine industries. E720 would also suit general aircraft fittings, sporting equipment, and a wide range of engineering applications. Toray E720 is compatible for co-cure with Toray's 120°C (248°F) cure resin film MicroPly™ EF72 and syntactic core Toray MicroPly™ SC72A. If fire retardant properties are required, refer to Toray E721-FR.

FEATURES

- ▶ **Excellent adhesive properties—ideal for honeycomb sandwich construction without the use of a resin film**
- ▶ **Medium tack level—easily laminates to mold surface**
- ▶ **Good impact resistance**
- ▶ **60 day out life at ambient temperature**
- ▶ **Available in woven fabric and unidirectional prepreg format**
- ▶ **Good surface finish**
- ▶ **Low volatile content—no solvents used during processing**

PRODUCT TYPE

120°C (248°F) Cure Toughened Epoxy Resin System

TYPICAL APPLICATIONS

- ▶ Motor racing
- ▶ Marine industries
- ▶ General aircraft fittings
- ▶ Sporting equipment
- ▶ Wide range of engineering applications

SHELF LIFE

Out Life:	60 days at 20°C (68°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	1.2 g/cm ³ (75 lbs/ft ³) at 23°C (73°F)
T _g (DMTA) after 1 hr at 120°C (248°F)	Onset: 110°C (230°F); Peak tan δ: 121°C (250°F)



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TYPICAL LAMINATE PROPERTIES

Standard Modulus T300 3K Carbon 280gsm 5HS				
Property	Condition	Method	Results	
Tensile Strength	RTD	EN ISO 524-4	621 MPa	90 ksi
Tensile Modulus	RTD	EN ISO 524-4	58.4 GPa	8.47 Msi
Poisson's Ratio	0.05			
Compression Strength	RTD	EN 2850	488 MPa	71 ksi
Compression Modulus	RTD	EN 2850	70 GPa	10.0 Msi
In-Plane Shear Strength	RTD	EN ISO 14129	99 MPa	14 ksi
In-Plane Shear Modulus	RTD	EN ISO 14129	3.5 GPa	0.51 Msi
Flexural Strength	RTD	EN ISO 14125	801 MPa	116 ksi
Flexural Modulus	RTD	EN ISO 14125	52.4 GPa	7.6 Msi
Interlaminar Shear Strength	RTD	EN ISO 14130	62 MPa	9 ksi

0/90° configuration woven laminates, cured 1 hour at 120°C (248°F), results normalized to 55% Vf
Tensile strain to failure was 0.9%

Intermediate Modulus T800 6K Carbon 276gsm 2x2 Twill				
Property	Condition	Method	Results	
Tensile Strength	RTD	EN ISO 527-4	1062 MPa	154 ksi
Tensile Modulus	RTD	EN ISO 527-4	68.2 GPa	9.9 Msi
Poisson's Ratio	0.05			
Compression Strength	RTD	EN 2855	530 GPa	77 ksi
Compression Modulus	RTD	EN 2855	84.1 GPa	12.2 Msi
In-Plane Shear Strength	RTD	EN ISO 14129	109 MPa	16 ksi
In-Plane Shear Modulus	RTD	EN ISO 14129	3.7 GPa	0.54 Msi
Flexural Strength	RTD	EN ISO 14125	866 MPa	126 ksi
Flexural Modulus	RTD	EN ISO 14125	63 GPa	9.1 Msi
Interlaminar Shear Strength	RTD	EN ISO 14130	61 MPa	9 ksi

0/90° configuration woven laminates, cured 1 hour at 120°C (248°F), results normalized to 55% Vf
Tensile strain to failure was 1.4%

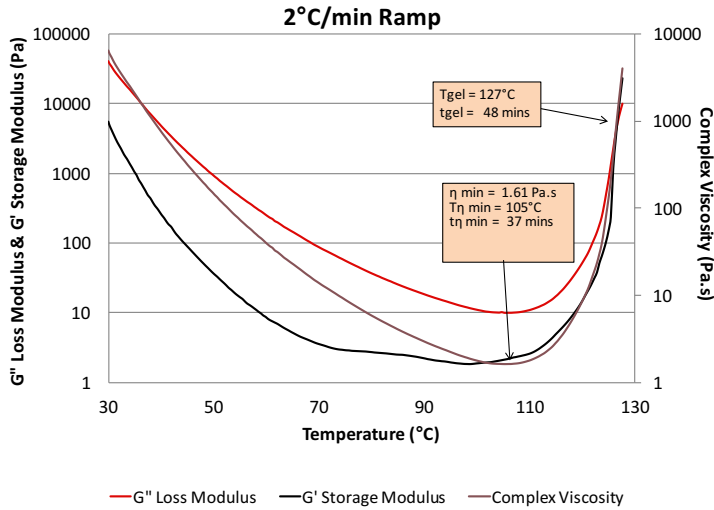
TYPICAL ADHESIVE PROPERTIES

T300 Type 3K Carbon 200gsm 2x2 Twill 46% RC	
Surface	Peel Strength N/76 mm (in-lb/° in)
Top	280 (31.5)
Bottom	340 (38)
Mean	310 (35)

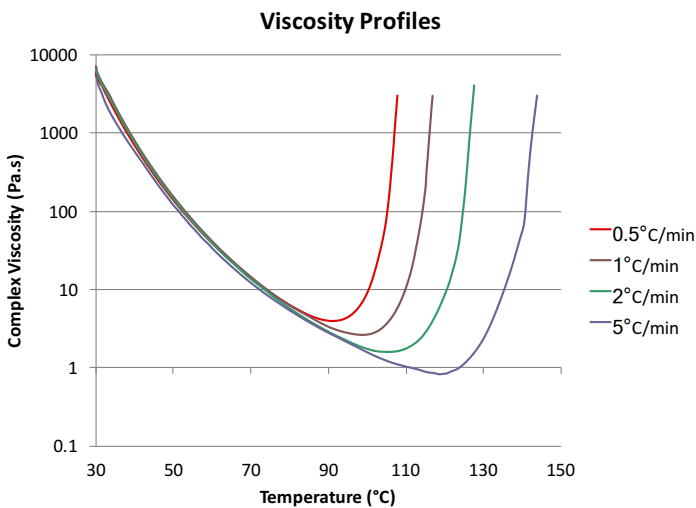
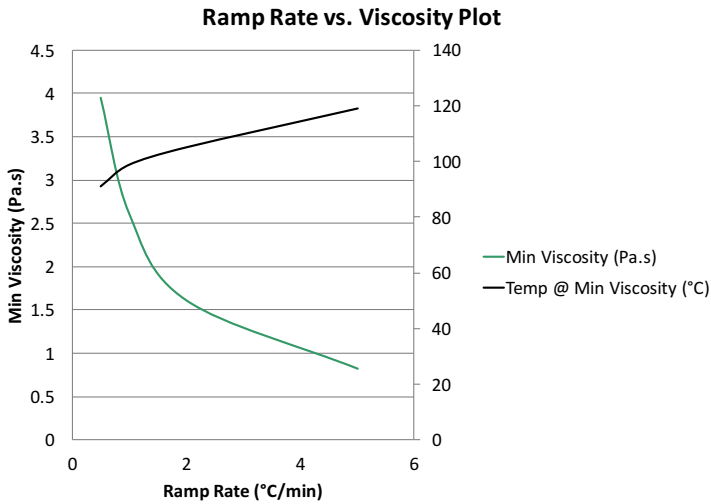
Climbing drum peel strength at 20°C (68°F) according to DTD 5577 using 2 plies of 200gsm Toray E720 on aluminum honeycomb 5.2-¼-25-3003
Ramped at 2°C/min from 30–120°C (86–248°F)
Held at 120°C (248°F) for 1 hour 25 psi pressure applied

PRODUCT DATA SHEET

RHEOLOGY



VISCOSITY



PRODUCT DATA SHEET

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

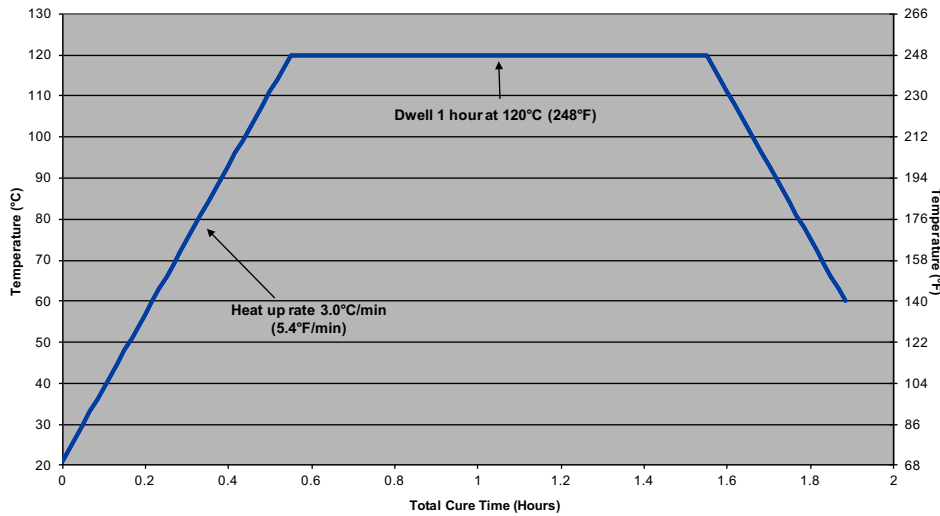
Ramp Rate [°C(°F)/min]	Minimum Viscosity (Pa.s)	Temperature at Minimum Viscosity
0.5 (1.0)	3.95	91°C (196°F)
1.0 (1.8)	2.61	98.7°C (210°F)
2.0 (3.6)	1.61	105°C (221°F)
5.0 (9)	0.82	119°C (246°F)

RECOMMENDED CURE CYCLE

- ▶ Toray E720 can be successfully molded by vacuum bag, autoclave, or matched die molding techniques
- ▶ Increase autoclave pressure to 1.4 bar (20 psi) with vacuum applied
- ▶ Vent to atmosphere and raise pressure to 6.2 bar (90 psi) (or max allowed by the core material)
- ▶ Increase air temperature at 3°C (5.4°F)/min and hold for 1 hour at 120°C (248°F)
- ▶ Allow to cool to 50°C (122°F) before removal of pressure

CURE SCHEDULE

Initial Minimum 120°C Cure Schedule



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EXOTHERM

In certain circumstances, such as the production of thick section laminates rapid heat-up rates or highly insulating masters, Toray E720 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 the Safety Data Sheet.

PROCESSING

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; 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.