Toray TC750

Toray Advanced Composites

PRODUCT DATA SHEET

DESCRIPTION

Toray TC750 is a toughened epoxy component prepreg developed for structural applications within high performance automotive. TC750 facilitates curing from 80°C (176°F) to 180°C (356°F) and can be pre-impregnated into a range of fiber and fabric types.

FEATURES

- **Versatile cure schedules—80°C (176°F) to 180°C (356°F)**
- **Toughened system with good balance of mechanical properties**
- **60-day out life for complex lay-ups**
- **Optimized tack and drape**
- **T_g (DMTA onset) of 140°C (284°F) after 1 hour at 135°C (275°F) autoclave cure**
- **Controlled flow**

SHELF LIFE

Out Life:	60 days at 20°C (68°F)
Frozen 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 (ASTM D792-13)	1.26 g/cm³ (78.7 lbs/ft³)
Dry T_g (DMA Onset) after 2 hrs at 180°C (356°F) at 2°C/min post cure (ASTM D7028)	160°C (320°F)

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MECHANICAL PROPERTIES

Standard Modulus FT300B 40B 3K Carbon 199g 2x2 Twill 40% RC									
Property	Method	Autoclave cured for 1 hr at 120°C (248°F) at 90psi				Autoclave cured for 1 hr at 135°C (275°F) at 90psi			
		RTD (Vf 51.78%)		RTD Normalised to 55% Vf		RTD (Vf 52.78%)		RTD Normalised to 55% Vf	
Tensile Strength 0°	BS EN ISO 527-4	589 MPa	85.4 ksi	626 MPa	90.8 ksi	599 MPa	86.9 ksi	624 MPa	90.5 ksi
Tensile Modulus 0°	BS EN ISO 527-4	59.0 GPa	8.6 Msi	62.7 GPa	91 Msi	60.1 GPa	8.7 Msi	62.6 GPa	9.1 Msi
Poisson's Ratio 0°	BS EN ISO 527-4	0.06		-		0.03		-	
Tensile Strength 90°	BS EN ISO 527-4	603 MPa	87.5 ksi	640 MPa	92.8 ksi	544 MPa	78.9 ksi	567 MPa	82.2 ksi
Tensile Modulus 90°	BS EN ISO 527-4	57.4 GPa	8.3 Msi	61.0 GPa	8.8 Msi	60.4 GPa	8.8 Msi	62.9 GPa	9.1 Msi
Poisson's Ratio 90°	BS EN ISO 527-4	0.05		-		0.03		-	
Compressive Strength 0°	pr EN 2850	819 MPa	118.8 ksi	870 MPa	126.2 ksi	774 MPa	112.3 ksi	807 MPa	117.0 ksi
Compressive Modulus 0°	pr EN 2850	53.9 GPa	7.8 Msi	57.3 GPa	8.3 Msi	54.7 GPa	7.9 Msi	57.0 GPa	8.3 Msi
Compressive Strength 90°	pr EN 2850	791 MPa	114.7 ksi	840 MPa	121.8 ksi	752 MPa	109.1 ksi	784 MPa	113.7 ksi
Compressive Modulus 90	pr EN 2850	54.9 GPa	8.0 Msi	58.3 GPa	8.5 Msi	54.7 GPa	7.9 Msi	57.0 GPa	8.3 Msi
In-Plane Shear Strength ±45°	ASTM D3518 M	119 MPa	17.3 ksi	-		109 MPa	15.8 ksi	-	
In-Plane Shear Modulus ±45°	ASTM D3518 M	4.34 GPa	0.63 Msi	-		4.20 GPa	0.61 Msi	-	
Poisson's Ratio	ASTM D3518 M	0.79		-		0.80		-	
Interlaminar Shear Strength 0°	ASTM D2344 M	87.9 MPa	12.7 ksi	-		89.1 MPa	12.9 ksi	-	
Interlaminar Shear Strength 90°	ASTM D2344 M	89.1 MPa	12.9 ksi	-		88.5 MPa	12.8 ksi	-	
G_IC	prEN 6033	422 J/m²		-		467 J/m²		-	
Cured Ply Thickness	-	0.211 mm		-		0.207 mm		-	

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Standard Modulus T700S C 50C 12K Carbon 380gsm 2x2 Twill 37% RC									
Property	Method	Autoclave cured for 1 hr at 120°C (248°F) at 90psi				Autoclave cured for 1 hr at 135°C (275°F) at 90psi			
		RTD (Vf 57.84%)		RTD Normalized to 55% Vf		RTD (Vf 58.49%)		RTD Normalized to 55% Vf	
Tensile Strength 0°	BS EN ISO 527-4	1064 MPa	154.3 ksi	1012 MPa	146.8 ksi	1051 MPa	152.4 ksi	988 MPa	143.3 ksi
Tensile Modulus 0°	BS EN ISO 527-4	64.5 GPa	9.4 Msi	61.3 GPa	8.9 Msi	69.0 GPa	10.0 Msi	64.9 GPa	9.4 Msi
Poisson's Ratio 0°	BS EN ISO 527-4	0.04		-		0.04		-	
Tensile Strength 90°	BS EN ISO 527-4	1027 MPa	149.0 ksi	977 MPa	141.7 ksi	955 MPa	138.5 ksi	898 MPa	130.2 ksi
Tensile Modulus 90°	BS EN ISO 527-4	63.8 GPa	9.3 Msi	60.7 GPa	8.8 Msi	69.0 GPa	10.0 Msi	64.9 GPa	9.4 Msi
Poisson's Ratio 90°	BS EN ISO 527-4	0.05		-		0.04		-	
Compressive Strength 0°	pr EN 2850	792 MPa	114.9 ksi	753 MPa	109.2 ksi	756 MPa	109.6 ksi	711 MPa	103.1 ksi
Compressive Modulus 0°	pr EN 2850	59.4 GPa	8.6 Msi	56.5 GPa	8.2 Msi	59.5 GPa	8.6 Msi	55.9 GPa	8.1 Msi
Compressive Strength 90°	pr EN 2850	775 MPa	112.4 ksi	737 MPa	106.9 ksi	754 MPa	109.4 ksi	709 MPa	102.8 ksi
Compressive Modulus 90	pr EN 2850	56.8 GPa	8.2 Msi	54.0 GPa	7.8 Msi	58.7 GPa	8.5 Msi	55.2 GPa	8.0 Msi
In-Plane Shear Strength ±45°	ASTM D3518 M	81.2 MPa	11.8 ksi	-		85.3 MPa	12.4 ksi	-	
In-Plane Shear Modulus ±45°	ASTM D3518 M	4.69 GPa	0.68 Msi	-		4.72 GPa	0.68 Msi	-	
Poisson's Ratio	ASTM D3518 M	0.79		-		0.77		-	
Interlaminar Shear Strength 0°	ASTM D2344 M	62.3 MPa	9.0 ksi	-		66.6 MPa	9.7 ksi	-	
Interlaminar Shear Strength 90°	ASTM D2344 M	56.0 MPa	8.1 ksi	-		64.9 MPa	9.4 ksi	-	
G_IC	prEN 6033	661 J/m²		-		777 J/m²		-	
Cured Ply Thickness	-	0.364 mm		-		0.361 mm		-	

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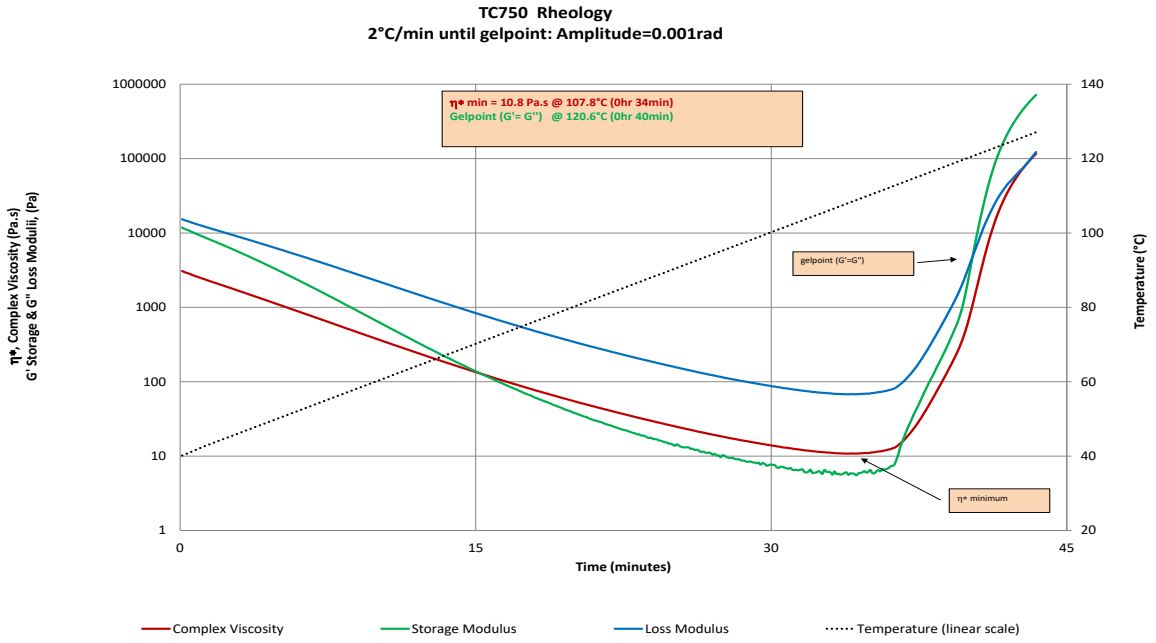
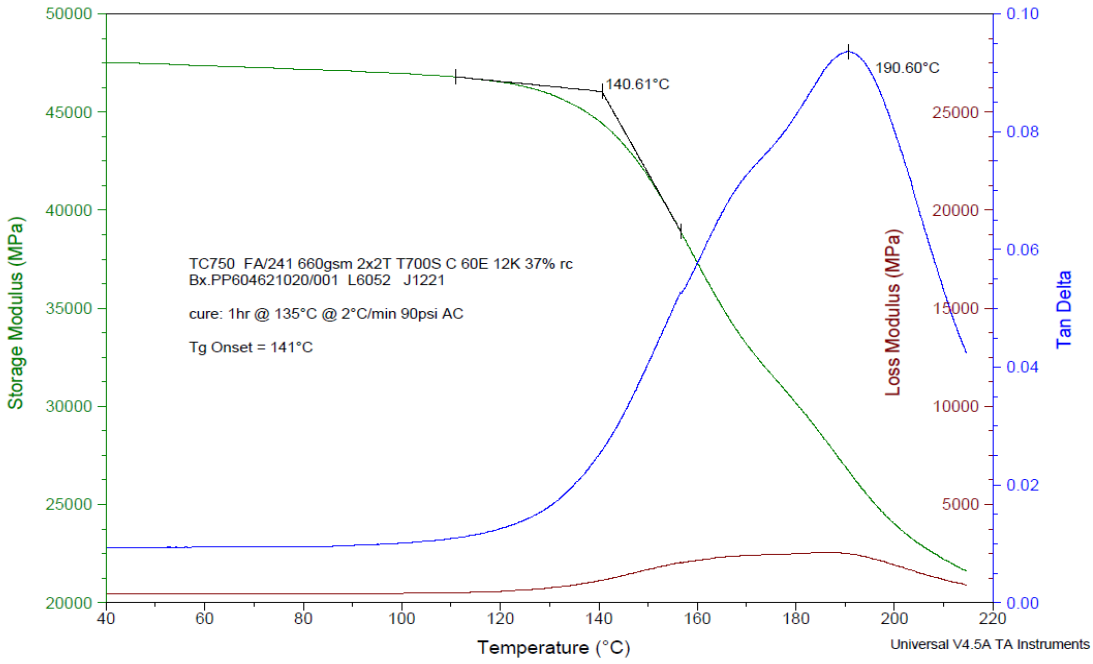
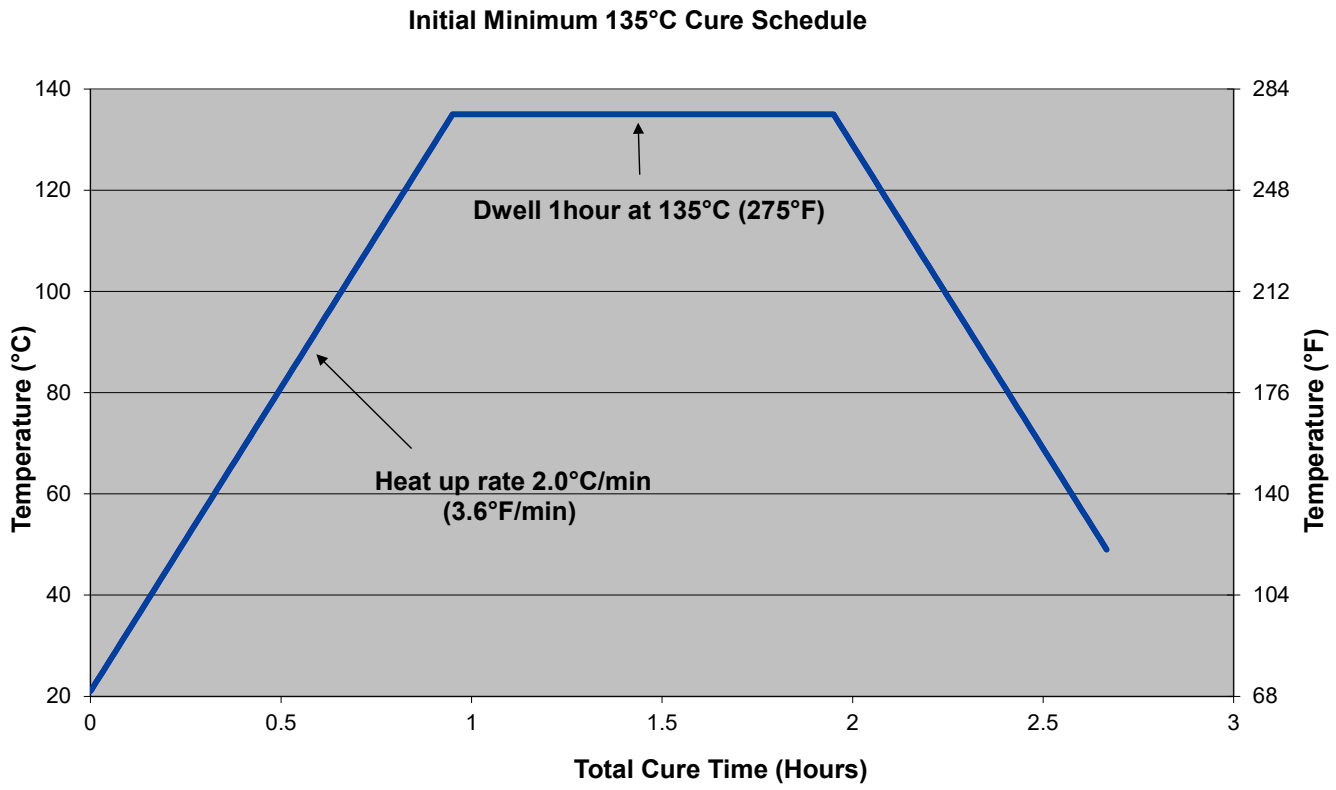
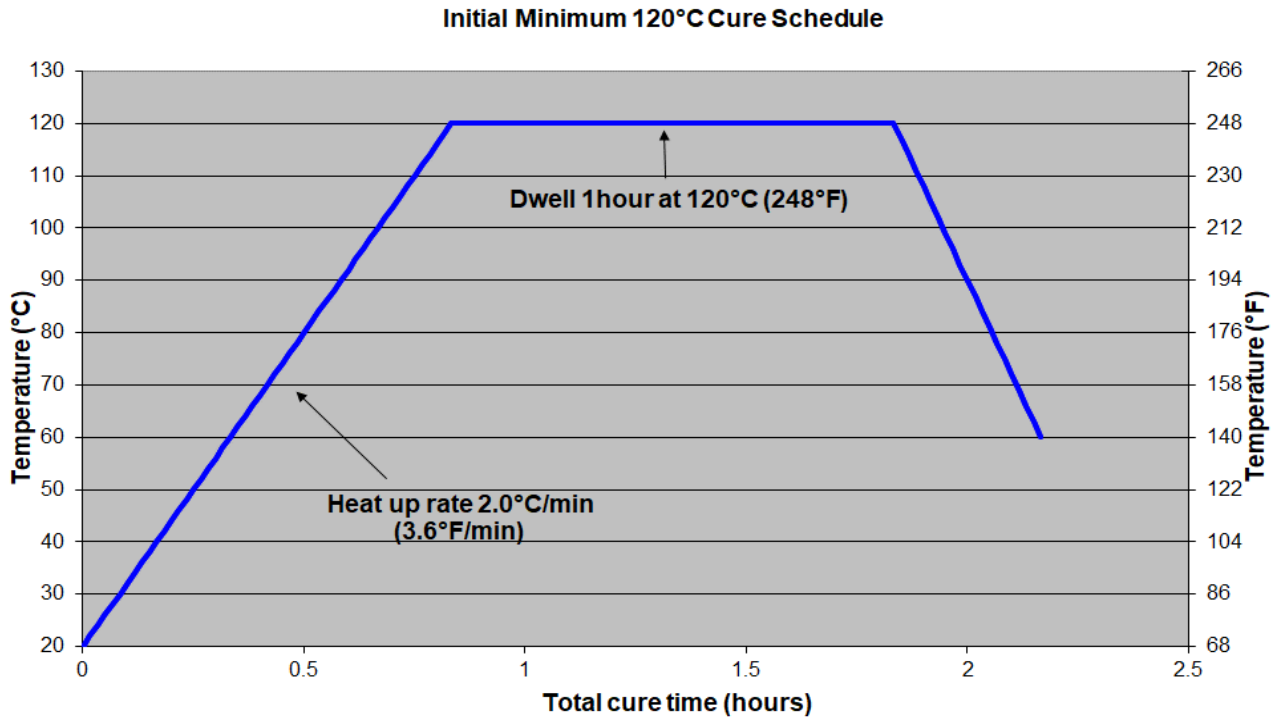


PHYSICAL PROPERTIES—DMA





135°C (275°F) Cure Temperature with 90psi Pressure		
Ramp	2.0°C (3.6°F)/min to 135°C (275°F)	Dwell for 1 hour
Cool	3.0°C (5.4°F)/min to 50°C (122°F)	Followed by demold
Total time: 2⅔ hours		



120°C (248°F) Cure Temperature with 90psi Pressure		
Ramp	2.0°C (3.6°F)/min to 120°C (248°F)	Dwell for 1 hour
Cool	2.0°C (3.6°F)/min to 50°C (122°F)	Followed by demold
Total time: 2⅙ hours		

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ALTERNATIVE CURE CYCLES

Dwell Temperature	Dwell Time (Hours)
80°C (176°F)	16
100°C (212°F)	4
150°C (302°F)	0.5
Note: to achieve maximum glass transition temperature a postcure of 2 hrs at 180°C (356°F) at 2°C (3.6°F) / minute can be utilized	

EXOTHERM

In certain circumstances, e.g the production of thick section laminates, rapid heating rates or highly insulating masters, Toray TC750 can undergo exothermic heating. A rapid temperature rise can lead to component degradation in extreme cases. Where this is considered likely, a cure incorporating an intermediate dwell is recommended to mitigate the risk. Note that the risk of thermal runaway increases with lay-up thickness and cure temperature

HANDLING SAFETY

Observe established precautions for handling epoxy resins and fibrous materials. Ensure adequate ventilation, wear gloves, eye-protection and protective clothing. For further information please refer to our Safety Data Sheet.

PROCESSING

To avoid moisture condensation: Following removal from cold storage, allow prepreg to reach room temperature before opening the polythene bag. Cut prepreg 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 948 mbar (28”Hg) is applied for 10 minutes.

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

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