

PRODUCT DATA SHEET

DESCRIPTION

Toray AmberTool® HX40 is an epoxy composite tooling prepreg. After a suitable post cure, an end use temperature of 190°C (374°F) is achieved. Toray AmberTool® HX40 is ideal for high temperature larger scale tooling, it offers an extended out life of 8 days at 18°C (64°F).

FEATURES

- ▶ Versatile curing options 50–75°C (122–167°F)
- ▶ High end use temperature of 190°C (374°F)
- ▶ Recommended cure of 12 hours at 65°C (149°F)
- ▶ Excellent drape and tack for complex shapes
- ▶ 8 days out life at 18°C (64°F)
- ▶ Capable of freestanding post cure
- ▶ Low volatile content giving excellent surface finish from an autoclave cure
- ▶ Low coefficient of thermal expansion (CTE)

PRODUCT TYPE

50–75°C (122–167°F) Cure
Low to Intermediate Temperature Curing Epoxy Tooling Prepreg

TYPICAL APPLICATIONS

- ▶ High temperature larger scale tooling

SHELF LIFE

Out Life:	8 days at 18°C (64°F)
Storage Life:	12 months at -18°C (< 0°F)

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

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

T_g (DMTA) after 190°C (374°F) post cure	Onset: 203°C (397°F); Peak $\tan \delta$: 229°C (444°F)
Typical CTE for a carbon tool	3.4 (1.9) x 10 ⁻⁶ /°C (°F)*

*CTE is dependent on construction and processing.
Figures quoted are based on standard 1-8-1 quasi-isotropic tooling laminates.



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

AmberTool®

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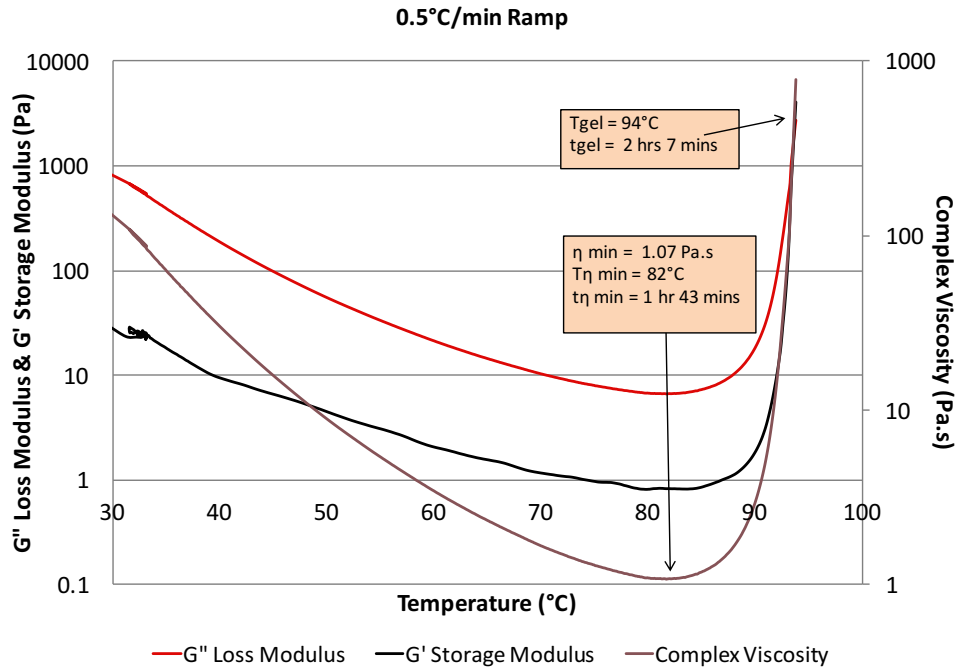
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REINFORCEMENTS AVAILABLE

Fiber Type	Weight (gsm)	Weave Style	Standard Resin Content w/o
Standard modulus 3K carbon	205	2 x 2 twill	46 (surface ply)
Standard modulus 12K carbon	650	2 x 2 twill	35
E-glass (EC9 yarn)	280	2 x 2 twill	38 (surface ply)
E-glass (1200 tex WR)	870	2 x 2 twill	28

Other fabrics and resin weights available on request

RHEOLOGY

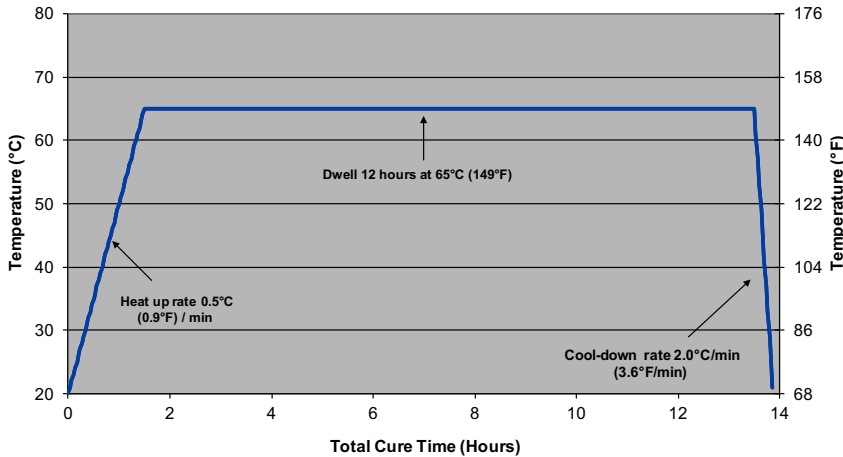


INITIAL MINIMUM CURE TIMES

Temperature	Time (hrs)
50°C (122°F)	40
55°C (131°F)	24
60°C (140°F)	18
65°C (149°F)	12
70°C (158°F)	9
75°C (167°F)	6

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INITIAL MINIMUM 65°C CURE SCHEDULE

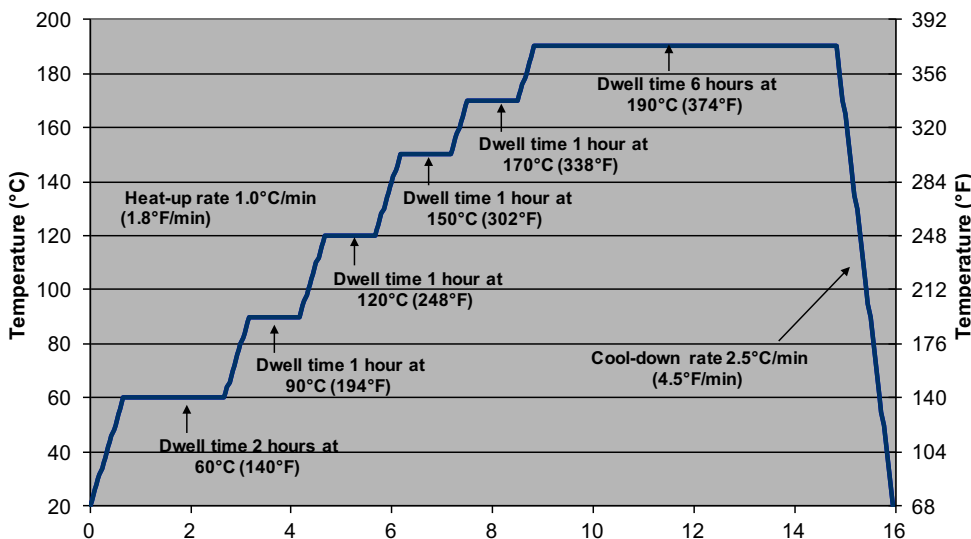


Caution: Toray AmberTool® HX40 prepreg contains a reactive resin system and care must be taken to avoid exothermic heating during the initial cure.

POST CURE TIME

Post Cure Schedule A		
Ramp	1°C (1.8°F)/min to 60°C (140°F)	Dwell for 2 hours
Ramp	1°C (1.8°F)/min to 90°C (194°F)	Dwell for 1 hour
Ramp	1°C (1.8°F)/min to 120°C (248°F)	Dwell for 1 hour
Ramp	1°C (1.8°F)/min to 150°C (302°F)	Dwell for 1 hour
Ramp	1°C (1.8°F)/min to 170°C (338°F)	Dwell for 1 hour
Ramp	1°C (1.8°F)/min to 190°C (374°F)	Dwell for 6 hours
Cool to 50°C (122°F) at 2.5°C/min (4.5°F/min)		

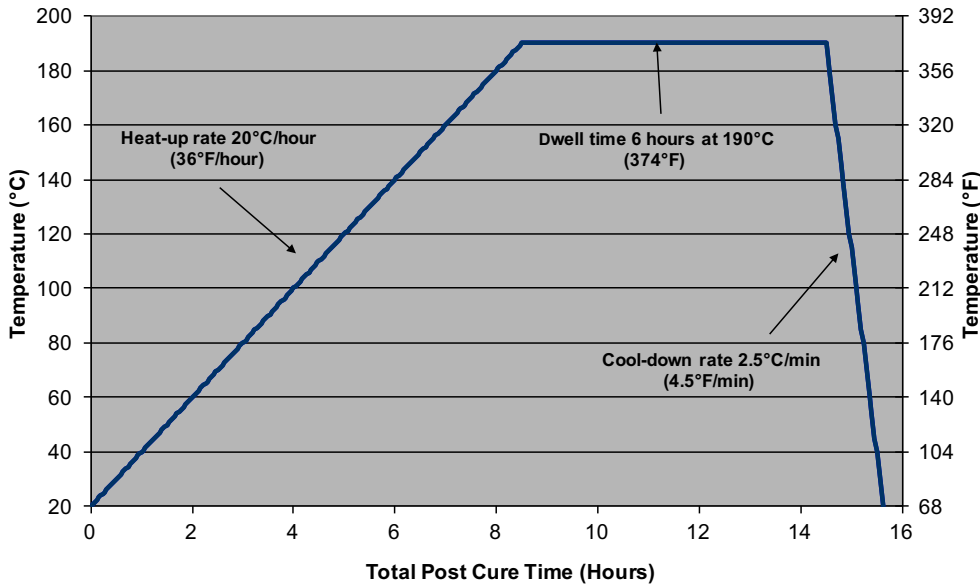
POST CURE SCHEDULE A



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POST CURE SCHEDULE B

An alternative post cure schedule may also be used as follows.



HANDLING SAFETY

Observe established precautions for handling epoxy resins and fibrous materials. Ensure adequate ventilation and wear gloves and protective clothing. For further information, refer to our Safety Data Sheet available from Toray Advanced Composites.

PROCESSING

Processing parameters and instructions are provided in the Toray AmberTool® material processing information guide from Toray Advanced Composites at www.toraytac.com/tooling.

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