

## PRODUCT DATA SHEET

### DESCRIPTION

Toray AmberTool® HXR56 is a low temperature curing epoxy composite tooling prepreg, fully impregnated into a carbon multiaxial backing ply construction. This two-layer product facilitates 3-D construction while allowing efficient lay-up, reducing overall tooling costs. HXR56 prepreg is co-compatible with our heritage AmberTool® HX56 carbon 205gsm 2x2 twill reinforcement surface ply. After a suitable post cure, an end use temperature of 180°C (356°F) is achieved.

### FEATURES

- ▶ Reduction in number of ply laminates
- ▶ Reduction in debulk stages
- ▶ Reduction in waste
- ▶ Improved cutting efficiency
- ▶ Low initial cure temperature
- ▶ Capable of freestanding post cure
- ▶ Maximum 180°C (356°F) tool end use temperature
- ▶ Low coefficient of thermal expansion (CTE)
- ▶ Low volatile content
- ▶ 50 hours out life at 18°C (64°F)

### PRODUCT TYPE

40–55°C (104–131°F) Low Temperature Curing Epoxy Tooling Prepreg

### TYPICAL APPLICATIONS

- ▶ Small-to-medium-sized autoclave tooling with fast cure, more efficient processing, excellent surface finish, and reduced overall tool cost

### SHELF LIFE

**Out Life:** 50 hours at 18°C (64°F)

**Storage Life:** 6 months at -18°C (0°F)

Out life is the maximum time allowed at ambient 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> (77lbs/ft <sup>3</sup> ) at 23°C (73°F)
T <sub>g</sub> (DMA) after 190°C (374°F) post cure	Onset: 185°C (365°F); Peak tan δ: 209°C (408°F)



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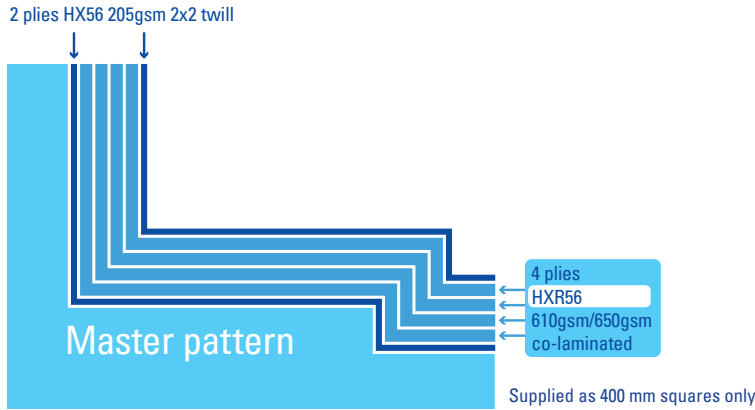
**AmberTool®**

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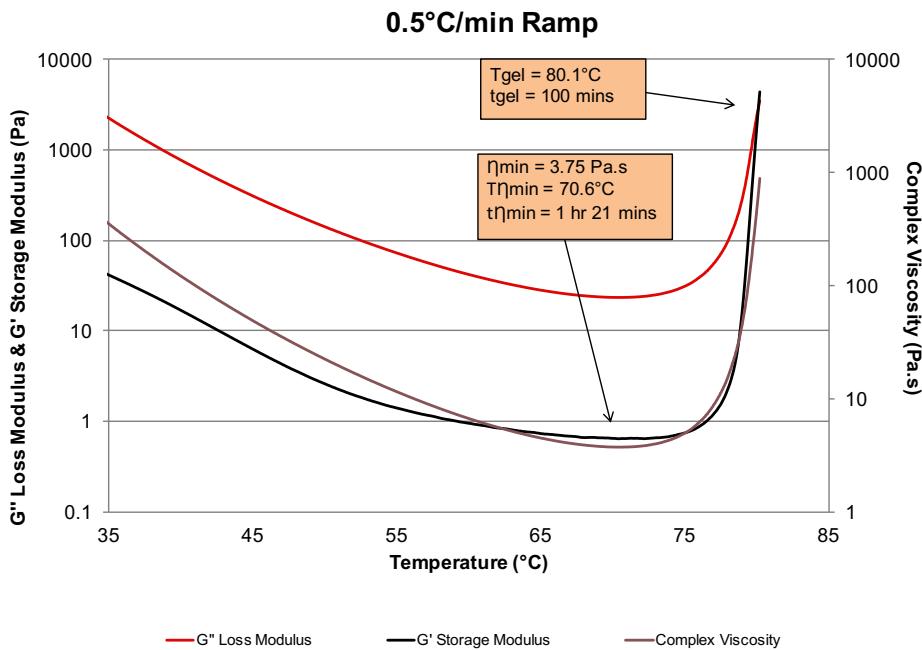
### TORAY AMBERTOOL® LAY-UP REINFORCEMENTS



### REINFORCEMENTS AVAILABLE

	Fiber Type	Weight (gsm)	Weave Style	Standard Resin Content w/o	Format	Molded Thickness (mm)
HX56	Standard modulus 3K carbon	205	2x2 twill	46 (surface ply)	400 mm x 400 mm squares or roll	0.23
HXR56 101	Standard modulus 50K carbon	610	±45° bi-axial	36 (bulk ply)	400 mm x 400 mm squares	1.30
	Standard modulus 12K carbon	650	2x2 twill			

### RHEOLOGY

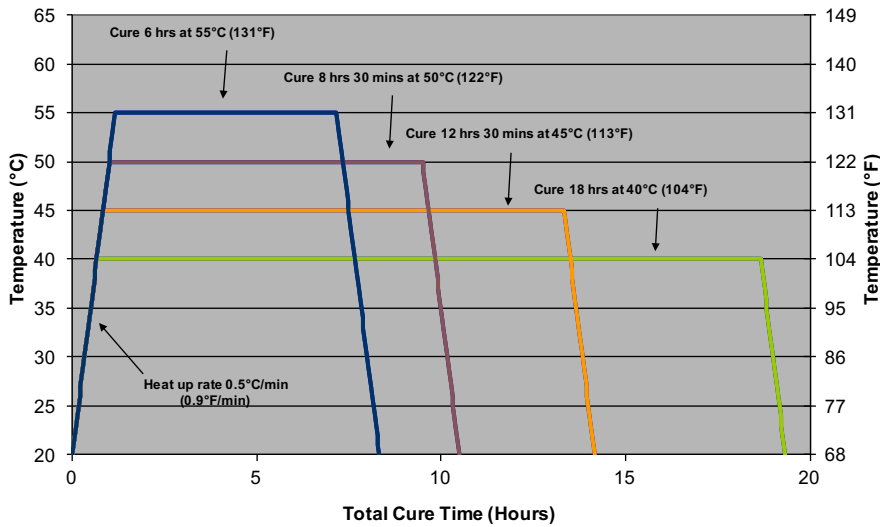


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### INITIAL MINIMUM CURE TIMES

Temperature	Time (hrs)
40°C (104°F)	18
45°C (113°F)	12.5
50°C (122°F)	8.5
55°C (131°F)	6

### INITIAL MINIMUM CURE SCHEDULE



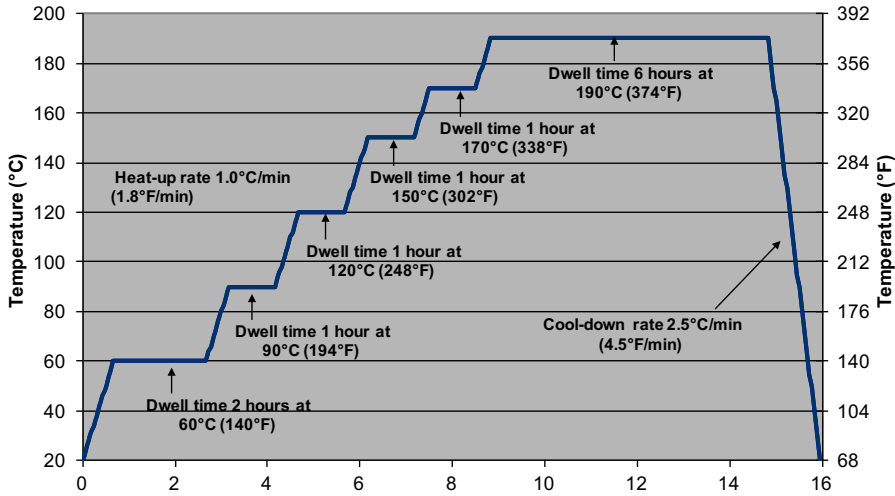
Alternative cure cycles at higher temperature may be used e.g., 4 hours at 60°C (140°F)  
 Caution: Toray AmberTool® HXR56 prepreg contains a reactive resin system and care must be taken to avoid exothermic heating during the initial cure. Avoid exceeding 65°C (149°F) during the initial cure.

### 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)		

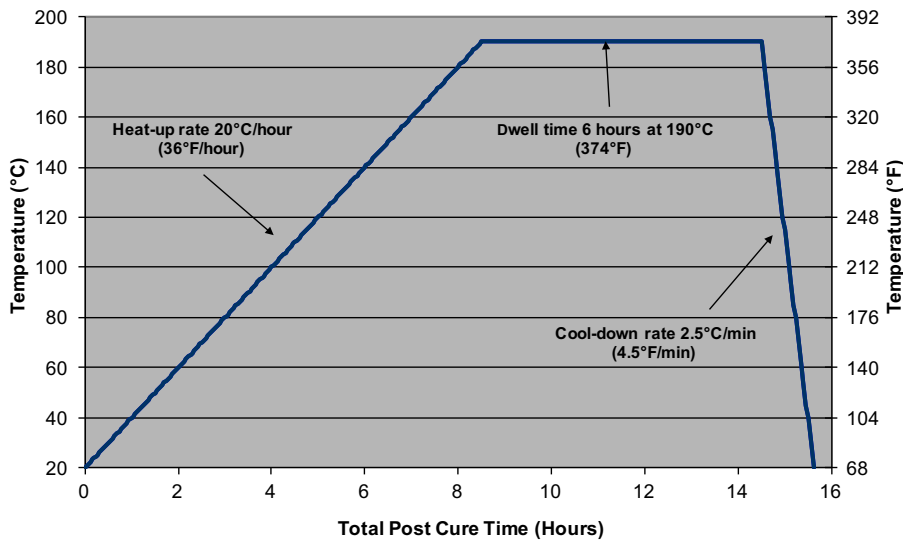
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### POST CURE SCHEDULE A



### POST CURE SCHEDULE B

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



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### 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](http://www.toraytac.com/tooling).

Revised 11/2019

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