

# PRODUCT DATASHEET



TENCATE ADVANCED COMPOSITES

## TenCate AmberTool® HXR50 Tooling prepreg

### PRODUCT TYPE

40-55°C (104-131°F) cure  
Low temperature curing epoxy  
tooling prepreg

### TYPICAL APPLICATIONS

- Small to medium sized 3D autoclave tooling with fast cure, more efficient processing, excellent surface finish and reduced cost

### KEY PROPERTIES



Smooth surface



Drapeable

### SHELF LIFE

#### Tack life

60 hours @ 18°C (64°F)

#### Storage life

6 months @ -18°C (0°F)

Tack life is time during which the prepreg retains enough tack, drape and handling for easy tool lay-up.

#### 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.

### PRODUCT DESCRIPTION

TenCate AmberTool® HXR50 is an epoxy resin system fully impregnated into a carbon multiaxial backing ply construction. This two layer product facilitates rapid speed of lamination and is co-compatible with our heritage HX50 carbon 205gsm 2x2 twill reinforcement surface ply. After a suitable post-cure, an end-use temperature of 180°C (356°F) is achieved.

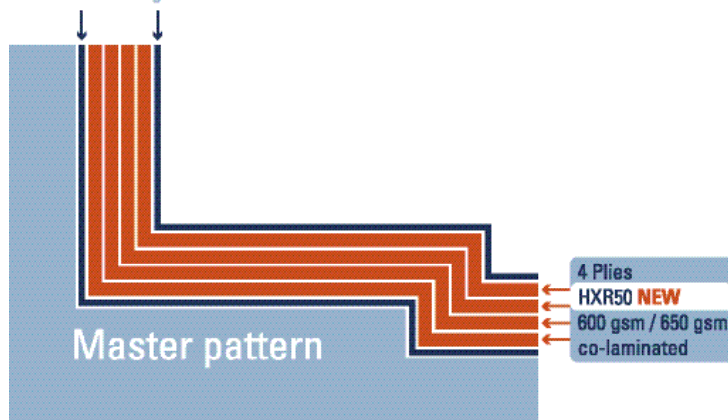
### TENCATE AMBERTOOL® HXR50 PREPREG BENEFITS / FEATURES

- Fully impregnated multiaxial construction
- Vastly reduced laminating time
- Reduction in de-bulk stages
- Reduction in waste
- Improved cutting efficiency
- Low initial cure temperature
- Capable of unsupported post cure
- Excellent drape for complex shapes
- High glass transition temperature
- Low coefficient of thermal expansion
- Low volatile content
- 60 hours tack life at 18°C (64°F)

### TENCATE AMBERTOOL® LAY-UP REINFORCEMENTS

Description	Construction	Format	Moulded thickness (mm)
HX50	HS Carbon 250gsm 2x2 twill 3k 46% rw (surface ply)	400mm x 400mm squares	0.23
HXR50 101	HS Carbon 600gsm ±45° Bi-Ax 50k 37% rw HS Carbon 650gsm 2x2 twill 12k 35% rw	400mm x 400mm squares	1.30

2 Plies HX50 205 gsm 2x2 twill



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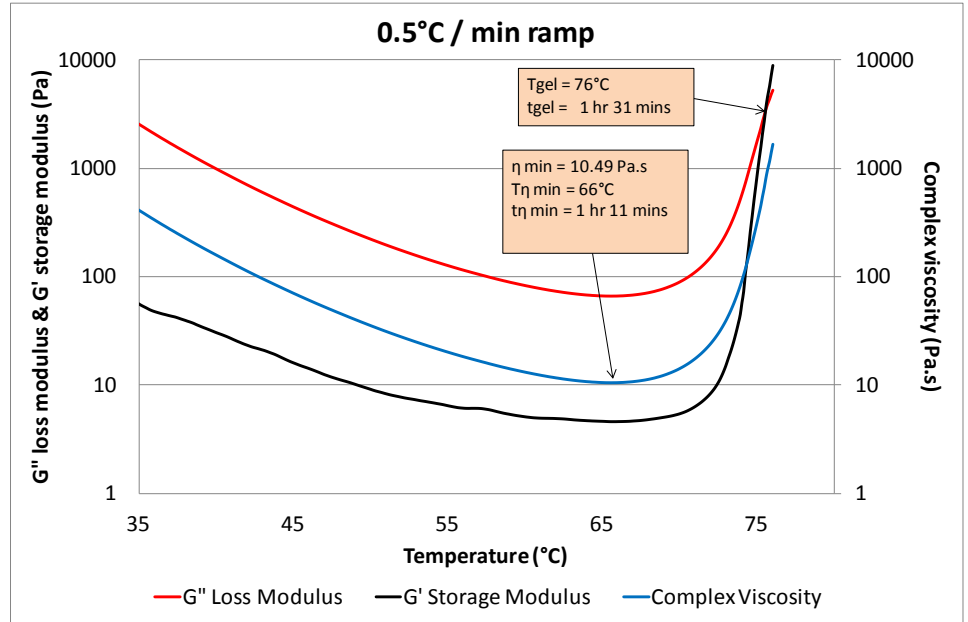
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### TYPICAL NEAT RESIN PROPERTIES

Density..... 1.23 g/cm<sup>3</sup> (77lbs/ft<sup>3</sup>) at 23°C (73°F)

T<sub>g</sub> (DMTA) after 190°C (374°F) post-cure ..... Onset: 190°C (374°F); Peak tan δ: 220°C (428°F)

### VISCOSITY PROFILE



### TENCATE AMBERTOOL® LAMINATING PROCEDURE

Procedure (gsm)	Ply no.	Fibre orientation	Pattern direction
Trim strips 205 2x2	-	+/- 45°	-
Laminate 205 2x2	1	0°	↗
Debulk			
HXR50 101	2	0°	↗
HXR50 101	3	0°	↗
Debulk	LAMINATE MID PLANE		
HXR50 101	4	0°	↗
HXR50 101	5	0°	↗
Debulk			
Laminate 205 2x2	6	0°	↗
Preparation for autoclave			
Autoclave cure			
Summary			
Individual plies	6		
Debulks	3		
Total fabric weight	5.41 kg/m <sup>2</sup>		
Laminate thickness	5.5mm		

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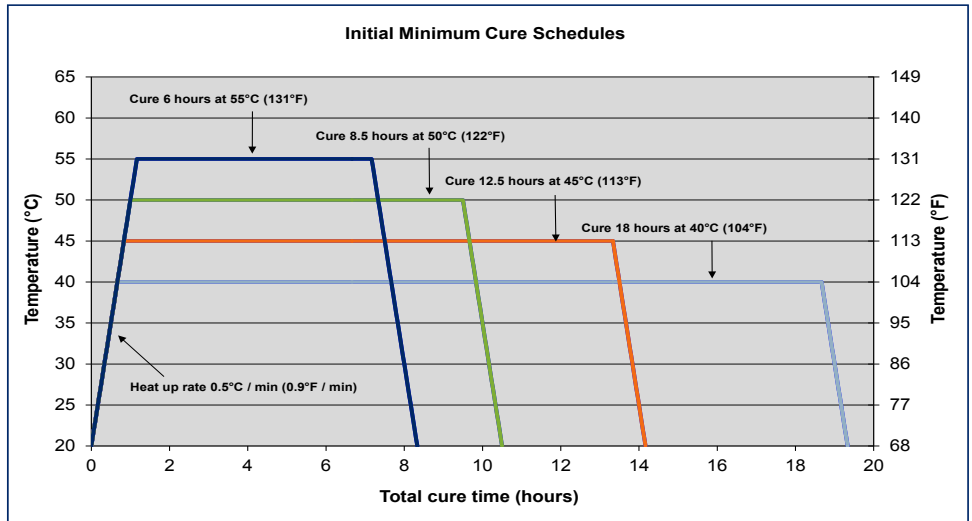


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### INITIAL MINIMUM CURE TIMES

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



Alternative cure cycles at higher temperature may be used e.g. 4 hours at 60°C (140°F)

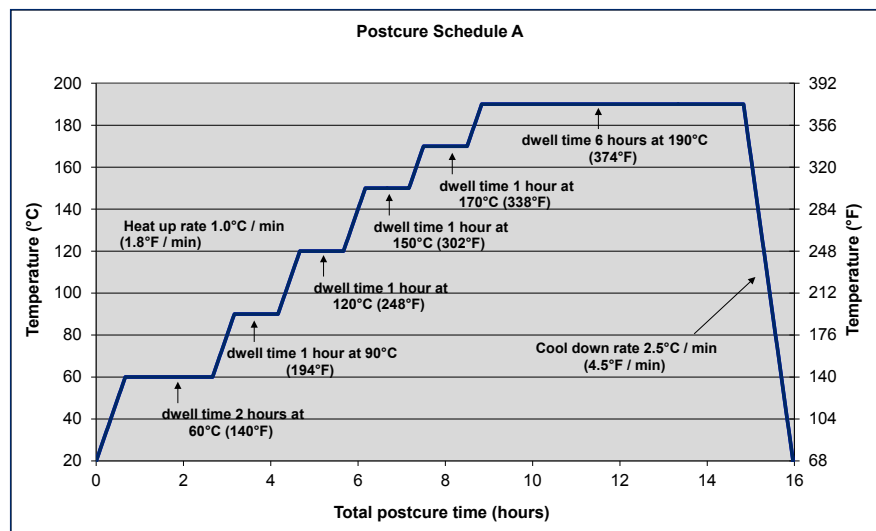
**Caution:** TenCate AmberTool HX50R & HX50 prepreg contains a reactive resin system and care must be taken to avoid exothermic heating during the initial cure. Avoid exceeding 65°C (149°F) during the initial cure.

### POST-CURE

#### 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 hours
Ramp	1°C (1.8°F) / min to 120°C (248°F)	Dwell for 1 hours
Ramp	1°C (1.8°F) / min to 150°C (302°F)	Dwell for 1 hours
Ramp	1°C (1.8°F) / min to 170°C (338°F)	Dwell for 1 hours
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)



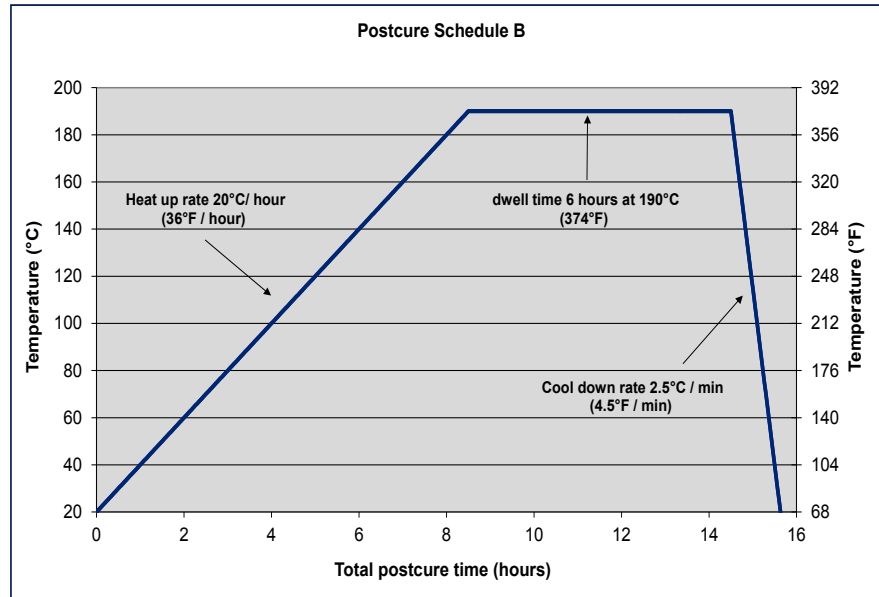
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An alternative post-cure schedule may also be used as follows:



### HANDLING SAFETY

Observe established precautions for handling epoxy resins and fibrous materials. Ensure adequate ventilation, wear gloves and protective clothing. For further information refer to our AmberTool® HXR50 Safety Data Sheet available from TenCate Advanced Composites, Langley Mill.

### PROCESSING

Processing parameters and instructions are provided in the TenCate AmberTool material pro-

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*All data given is based on representative samples of the materials in question. Since the method and circumstances under which these materials are processed and tested are key to their performance, and TenCate Advanced Composites has no assurance of how its customers will use the material, the corporation cannot guarantee these properties.*

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