**PRODUCT DESCRIPTION**

TenCate AmberTool® HX50 is an epoxy resin system that can be pre-impregnated into high performance fibres such as carbon, glass and aramid. After a suitable post-cure, an end-use temperature of 180ºC (356ºF) is achieved.

**TEN CATE AMBERTOOL® HX50 PREPREG BENEFITS/FEATURES**

- 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 18ºC (64ºF)
- 6 months storage life at -18ºC (0ºF)

**TYPICAL NEAT RESIN PROPERTIES**

- **Density**: 1.23 g/cm³ (77lbs/ft³) at 23ºC (73ºF)
- **Tg (DMTA) after 190ºC (374ºF) post-cure**: Onset: 190ºC (374ºF); Peak tan δ: 220ºC (428ºF)
- **Typical C.T.E. for a carbon tool**: 3.1 (1.7) x10⁻⁶/°C (ºF)*
- **Typical C.T.E. for a glass tool**: 12.7 (7) x10⁻⁶/°C (ºF)*

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

**TOOLING PREPREG**

- **Product Type**: 40-55ºC (104-131°F) cure
- **Low temperature curing epoxy tooling prepreg**

**TYPICAL APPLICATIONS**

- Small to medium sized autoclave tooling with fast cure and excellent surface finish

**SHELF LIFE**

- **Tack life**: 60 hours @ 18ºC (64ºF)
- **Storage life**: 6 months @ -18ºC (0ºF)

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.

**VISCOITY PROFILE**

![Viscosity Profile Graph]

- **Tgel = 76°C**
- **tigel = 1 hr 31 mins**
- **ηmin = 10.49 Pa.s**
- **Tgmin = 66°C**
- **tmin = 1 hr 11 mins**
TenCate AmberTool® HX50 Tooling prepreg

REINFORCEMENTS AVAILABLE

<table>
<thead>
<tr>
<th>Fibre type</th>
<th>Weight (gsm)</th>
<th>Weave Style</th>
<th>Moulded thickness (mm)</th>
<th>Standard resin content w/o</th>
</tr>
</thead>
<tbody>
<tr>
<td>High strength carbon 3k</td>
<td>205</td>
<td>2x2 twill</td>
<td>0.23</td>
<td>46 (surface ply)</td>
</tr>
<tr>
<td>High strength carbon 12k</td>
<td>650</td>
<td>2x2 twill</td>
<td>0.62</td>
<td>35</td>
</tr>
<tr>
<td>E glass (EC6 yarn)</td>
<td>300</td>
<td>8 harness satin</td>
<td>0.24</td>
<td>38 (surface ply)</td>
</tr>
<tr>
<td>E glass (EC9 yarn)</td>
<td>850</td>
<td>8 harness satin</td>
<td>0.60</td>
<td>28</td>
</tr>
<tr>
<td>E glass (1200 tex WR)</td>
<td>870</td>
<td>2x2 twill</td>
<td>0.60</td>
<td>28</td>
</tr>
</tbody>
</table>

Other fabrics and resin weights available on request.

INITIAL MINIMUM CURE TIMES

<table>
<thead>
<tr>
<th>Temperature °C (°F)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 (104)</td>
<td>18</td>
</tr>
<tr>
<td>45 (113)</td>
<td>12.5</td>
</tr>
<tr>
<td>50 (122)</td>
<td>8.5</td>
</tr>
<tr>
<td>55 (131)</td>
<td>6</td>
</tr>
</tbody>
</table>

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

Caution: TenCate AmberTool 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

<table>
<thead>
<tr>
<th>Post-cure schedule A:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramp</td>
</tr>
<tr>
<td>1°C (1.8°F) / min to 60°C (140°F)</td>
</tr>
<tr>
<td>1°C (1.8°F) / min to 90°C (194°F)</td>
</tr>
<tr>
<td>1°C (1.8°F) / min to 120°C (248°F)</td>
</tr>
<tr>
<td>1°C (1.8°F) / min to 150°C (302°F)</td>
</tr>
<tr>
<td>1°C (1.8°F) / min to 170°C (338°F)</td>
</tr>
<tr>
<td>1°C (1.8°F) / min to 190°C (374°F)</td>
</tr>
</tbody>
</table>

Cool to 50°C (122°F) at 2.5°C / min (4.5°F / min)
TenCate AmberTool® HX50 Tooling prepreg

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

**Postcure Schedule A**
- Heat up rate 1.0°C/min (1.8°F/min)
- Dwell time 1 hour at 170°C (338°F)
- Dwell time 1 hour at 150°C (302°F)
- Dwell time 1 hour at 120°C (248°F)
- Dwell time 1 hour at 90°C (194°F)
- Dwell time 2 hours at 60°C (140°F)
- Cool down rate 2.5°C/min (4.5°F/min)

**Postcure Schedule B**
- Heat up rate 20°C/hour (36°F/hour)
- Dwell time 6 hours at 190°C (374°F)
- Cool down rate 2.5°C/min (4.5°F/min)

**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 Material Safety Data Sheet available from TenCate Advanced Composites, Langley Mill.

**PROCESSING**
Processing parameters and instructions are provided in the TenCate AmberTool material processing information guide from TenCate Advanced Composites or at www.tencate.com/tooling.