COMPOSITE TOOLING PREPREGS

Product Overview

TORAY AMBERTOOL® COMPOSITE TOOLING PREPREGS

<table>
<thead>
<tr>
<th>RESIN</th>
<th>Tg (ONSET)*1</th>
<th>MIN CURE TEMP</th>
<th>TYPICAL CURE TIME AND TEMPERATURE*1</th>
<th>OUT LIFE</th>
<th>KEY PRODUCT CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HX02-1E</td>
<td>Epoxy</td>
<td>162°C (322°F)</td>
<td>65°C (149°F)</td>
<td>12 hours</td>
<td>Long out life for large applications</td>
</tr>
<tr>
<td>HX055E</td>
<td>Epoxy</td>
<td>185°C (365°F)</td>
<td>40°C (104°F)</td>
<td>50 hours</td>
<td>Quasi-isotropic two-layer product for rapid lamination</td>
</tr>
<tr>
<td>HX58**</td>
<td>Epoxy</td>
<td>185°C (365°F)</td>
<td>40°C (104°F)</td>
<td>65 hours</td>
<td>Improved handleability</td>
</tr>
<tr>
<td>HX58**</td>
<td>Epoxy</td>
<td>160°C (320°F)</td>
<td>40°C (104°F)</td>
<td>60 hours</td>
<td>Excellent surface finish</td>
</tr>
<tr>
<td>HX42</td>
<td>Epoxy</td>
<td>200°C (392°F)</td>
<td>50°C (122°F)</td>
<td>6 hours</td>
<td>Proven system for aerospace</td>
</tr>
<tr>
<td>HX40</td>
<td>Epoxy</td>
<td>203°C (397°F)</td>
<td>50°C (122°F)</td>
<td>12 hours</td>
<td>Large tooling applications</td>
</tr>
<tr>
<td>TC40**</td>
<td>BMI</td>
<td>213°C (415°F)</td>
<td>182°C (360°F)</td>
<td>6 hours</td>
<td>High service temperature</td>
</tr>
</tbody>
</table>

*1 after post cure *2 followed by post cure | Sourced from: *3 Europe *4 North America

NEW PRODUCTS

Toray AmberTool® HX056 is the latest innovation from our heritage range of composite tooling prepregs. The new Toray AmberTool® HX series is a multi-axial format, specifically designed for when complexity and speed are required, ultimately reducing overall tooling costs.

Example of HX lay-up:

2 plies HX 205gsm 2x2 twill

For more product information such as product data sheets, case studies, or technical papers, please use the following resources:

www.toray.com/processing-guides

Cure Capable Mandrel for Aerospace Structures

Find this case study and more at www.toray.com/success-stories

Please visit our website to request a print copy of our processing guide:

www.toray.com/tooling

AmberTool®

TOOLING REINVENTED

The increased use of composites materials is driving the need for more advanced composite tooling solutions. Part manufacturers are demanding tools with longer life and tighter tolerances while pushing for more efficient production methods. The market demands a trusted technology partner that can provide world-class innovation, manufacturing, and service.

With more than 25 years of pedigree in demanding tooling applications, the Toray AmberTool® collection of prepregs comprised of the HX, HXR, and TC series, is sold globally by a proven team of tooling experts. Our comprehensive range of prepregs for aerospace applications cure from 50°C (122°F) while delivering Tg properties up to 213°C (415°F). These materials are available on a wide range of reinforcements, allowing our customers to have complete tool design freedom and flexibility.

COMPLETE TOOL DESIGN FREEDOM

Toray AmberTool® composite tooling prepregs allow high precision for molded and machined tooling applications with a superior degree of accuracy. We support our products globally, offering customers a complete technical support service including tailored training courses.

INDUSTRY-LEADING COMPOSITE TOOLING EXPERIENCE

Master and surface coat application
- Compatible with high-performance epoxy paste and block master patterns
- Specialized sealing and release agent recommendations
- Excellent surface finish generation

Full tooling delivery solutions
- Custom cutting solutions within Europe
- Fast delivery solutions for standard materials from stock
- Wide range of carbon and glass reinforcements with curing temperatures as low as 40°C (104°F) and Tg’s up to 213°C (415°F) (after post cure)
- Surface machinable for final accuracy
- Carbon and glass backing structures

 Experienced technical support
- Proven processing procedures and full tooling processing guide available
- Tailored training courses offered
- Specialized tooling knowledge on surface treatments and advanced experience in mold heating applications
- Mold life-cycle maintenance solutions
- New materials research, assuring health and safety compliance

TOOL DESIGN FLEXIBILITY

INTRINSICALLY QUASI-ISOTROPIC
HANDLABLE AT AMBERTOOL TEMPERATURES
EXCELLENT SURFACE FINISH

FEATURED PRODUCTS:

Toray AmberTool® HX056

Please visit our website to request a print copy of our processing guides.
LOCATIONS AND CAPABILITIES

SOLUTIONS
- Thermoplastic composites
- Thermoplastic laminates
- Thermoset composites
- Carbon-free manufacturing
- Parts manufacture
- Sales office

CERTIFICATIONS
- ISO 9001:2015
- AS9100D

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