

AmberTool[®]

Composite Tooling Prepreg Selector Guide



TOOLING REINVENTED

'TORAY'

Toray Advanced Composites

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 20 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 T_g 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
- ▶ Wide range of carbon and glass reinforcements with curing temperatures as low as 40°C (104°F) and T_g's up to 213°C (415°F) (after post cure)
- ▶ Surface machinable for final accuracy
- ▶ Carbon and glass backing structures



Courtesy of The National Composites Centre, UK

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

TORAY AMBERTOOL® COMPOSITE TOOLING PREPREGS

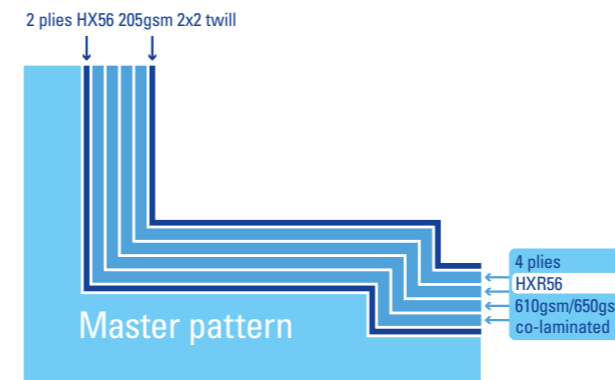
	RESIN	T _g (ONSET)*1	MIN CURE TEMP	TYPICAL CURE TIME AND TEMPERATURE*2	OUT LIFE	KEY PRODUCT CHARACTERISTICS	AEROSPACE	INDUSTRIAL	MOTORSPORT	AUTOMOTIVE	ENERGY
HX32-1*3 NEW	Epoxy	162°C (323°F)	65°C (149°F)	12 hours at 70°C (158°F)	30 days	▶ Long out life for large applications		○			○
HXR56*3 NEW	Epoxy	185°C (365°F)	40°C (104°F)	8.5 hours at 50°C (122°F)	50 hours	▶ Quasi-isotropic two-layer product for rapid lamination		○	○	○	○
HX56*3	Epoxy	185°C (365°F)	40°C (104°F)	8.5 hours at 50°C (122°F)	60 hours	▶ Improved handleability		○	○	○	○
HX50*3	Epoxy	190°C (374°F)	40°C (104°F)	8.5 hours at 50°C (122°F)	60 hours	▶ Excellent surface finish		○	○	○	
HX42	Epoxy	200°C (392°F)	50°C (122°F)	8 hours at 60°C (140°F)	5 days	▶ Proven system for aerospace	○	○	○	○	
HX40	Epoxy	203°C (397°F)	50°C (122°F)	12 hours at 65°C (149°F)	8 days	▶ Large tooling applications	○	○			○
TC40*4	BMI	213°C (415°F)	182°C (360°F)	6 hours at 182°C (360°F)	14 days	▶ High service temperature	○				

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

NEW PRODUCTS

Toray AmberTool® HXR56 is the latest innovation from our heritage range of composite tooling prepregs. The new Toray AmberTool® HXR series is a multi-axial format, specifically designed for when complexity and speed are required, ultimately reducing overall tooling costs.

Example of HXR lay-up:



TOOL DESIGN FREEDOM AND FLEXIBILITY



INTRINSICALLY QUASI-ISOTROPIC



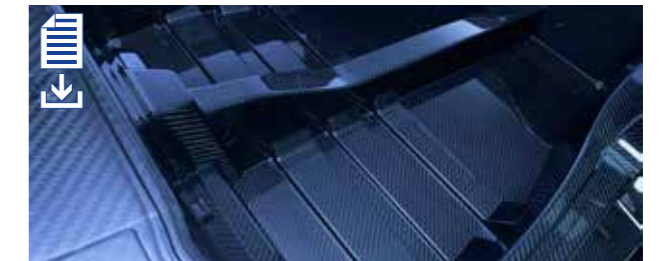
HANDLEABLE AT AMBIENT TEMPERATURES



EXCELLENT SURFACE FINISH



Please visit our website to request a print copy of our processing guide:
www.toraytac.com/processing-guides



Toray AmberTool® Tooling Prepreg Processing Guide

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



Cure Capable Mandrel for Aerospace Structures

Featured products: ▶ Toray AmberTool® HX42

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



Search for the Toray TAC Product Selector



www.toraytac.com/tooling

LOCATIONS AND CAPABILITIES

SOLUTIONS

- Thermoplastic composites
- Thermoplastic laminates

- Thermoset composites
- Carbon-free manufacturing

- Parts manufacture
- Sales office

CERTIFICATIONS

- ISO 9001:2015
- AS9100D

- ISO 14001:2015
- ISO 45001:2018

Fairfield - California, United States

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Morgan Hill - California, United States

- ● ● ● ● ■ ■ ■ ■ ■

Camarillo - California, United States

- ● ● ● ● ■ ■ ■ ■ ■

Nottingham, United Kingdom

- ● ● ● ● ■ ■ ■ ■ ■

Nijverdal, The Netherlands

- ● ● ● ● ■ ■ ■ ■ ■

Toulouse, France

- ● ● ● ● ■ ■ ■ ■ ■

Guangzhou, China

- ● ● ● ● ■ ■ ■ ■ ■

Taichung, Taiwan

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

 Search for the **Toray TAC Product Selector**

 www.toraytac.com

Go to our online resource center for case studies and technical papers

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