

Advanced Composite Material Portfolio

Selector Guide



Leading the Way in
Material Technology
Solutions

- ▶ Thermoset
- ▶ Thermoplastic
- ▶ Ancillaries
- ▶ RTM & BMC

'TORAY'
Toray Advanced Composites

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Introduction to Toray Advanced Composites

Materials Technology and Capabilities

Market-Leading Technology and Capabilities

Toray Advanced Composites is a global leader in the development and manufacture of a wide range of advanced composite material solutions for aerospace, satellite, communications, and high performance industrial markets. Our goal is to increase our customers' advantage with our market-leading product portfolio, a world-class technical support team, and award-winning customer service.

Toray Advanced Composites operates five prepreg manufacturing sites globally, with three facilities in North America and two in Europe. Three of our facilities offer true carbon-free areas to serve the sensitive radome and communication industries with low dielectric constant and low-loss materials. Our major production sites operate aerospace-quality systems and are certified to ISO9001:2015 and/or AS9100D.

Toray Advanced Composites is unique in the industry, offering a broad spectrum of thermoplastic and thermoset prepreg systems, with particular expertise in high performance thermoplastic composites (under the brand name Toray Cetex®). Our broad product portfolio supports programs from prototyping through to high-volume manufacture of parts.

Your Global Partner

Our state-of-the-art manufacturing facilities around the world allow Toray to efficiently supply composite materials to global customers. Ongoing investments in facilities and personnel ensure production excellence to meet today's requirements and tomorrow's demand. Stop by and see for yourself. We welcome customer visits and look forward to the opportunity to work with you on your next project.

Innovation

Investing in innovation for over 45 years, our strong customer focus on tailored systems, combined with our comprehensive laboratory and testing capabilities, allows for rapid development, customization, and database development. Our experience in thermoset and thermoplastic resins, various composite fibers, and part design allows us to rapidly innovate to customer needs. Recognized in the industry for providing optimized fiber and resin solutions, we deliver advanced customer-oriented products to the market.


AmberTool®

Cetex®

MicroPly™

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**
Available on the  App Store and  Google Play

 www.toraytac.com
Go to our online resource center for case studies and technical papers

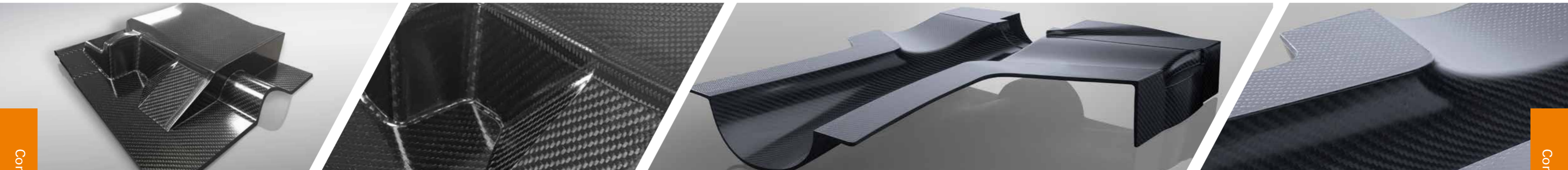


	POLYMER	MELTING TEMPERATURE T _m	PROCESSING TEMPERATURE T _p	KEY PRODUCT CHARACTERISTICS	PRODUCT FORMATS			PROCESSING			PRODUCT ATTRIBUTES							MARKET SEGMENTS										
					UDTAPE	WOVEN PREPREG	RTL LAMINATE	WELDABLE/JOINTING	AUTOCLAVE	PRESS FORMING	AFP/ATL	DURABILITY/TOUGHNESS	FLAME RETARDANT	CHEMICAL RESISTANT	CORROSION RESISTANT	IMPACT RESISTANT	HIGH TEMPERATURE PERFORMANCE	LOW MOISTURE ABSORPTION	MECHANICAL PERFORMANCE	AEROSPACE								
																				AEROSTRUCTURES	SPACE AND SATELLITE	LAUNCH	RADOMES	AIRCRAFT INTERIORS	AERO ENGINES	INDUSTRIAL		
TC910	PA6 Nylon 6	220°C (428°F)	249–271°C (480–520°F)	<ul style="list-style-type: none"> Temperature and solvent resistant Use as a preform insert for compression and overmolding to improve part performance 	○			○	○	○	○	○		○	○	○	○	○							○			
TC915 NEW	PA+™ High-Performance Polyamide	243°C (469°F)	260–300°C (500–572°F)	<ul style="list-style-type: none"> Exceptional mechanical properties higher than typical polyamide-based composites and Nylon materials. Excellent resistance to water absorption for better solvent resistance. Excellent producibility and formability 	○					○	○	○		○											○			
TC940	PET Polyethylene-Terephthalate	215°C (419°F)	240–270°C (435–518°F)	<ul style="list-style-type: none"> Good impact resistance for recreational and low cost applications 	○			○	○	○	○	○		○	○	○	○								○			
TC960	PP Polypropylene	160°C (320°F)	199–216°C (390–421°F)	<ul style="list-style-type: none"> High toughness for vehicle and low cost applications 	○			○	○	○	○	○		○	○	○	○								○			
TC1005 NEW	PEI Polyetherimide	Amorphous	320–350°C (608–662°F)	<ul style="list-style-type: none"> Balance of cost & performance compared with TC1000 Excellent FST performance Standard modulus carbon and glass fiber UD tape available 	○			○	○	○		○	○	○	○	○	○						○		○			
TC1000	PEI Polyetherimide	Amorphous	320–350°C (608–662°F)	<ul style="list-style-type: none"> Widely used in aircraft interiors, qualified to OEM specifications Excellent FST performance Carbon, glass and aramid fabrics available SM and IM+ carbon fiber UD tape available 	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				○	○	○	○		
TC1100	PPS Polyphenylenesulfide	280°C (536°F)	300–330°C (572–626°F)	<ul style="list-style-type: none"> Microcrack free Low flammability, achieves 35/35 for OSU performance Good CAI properties 229 MPa (33.2 ksi) Ideal for leading edges, beams, clips, and floor panels 	○	○	○	○	○	○	○	○	○	○		○	○							○	○	○		
TC1130 NEW	PESU PolyEtherSulphone	Amorphous	320–350°C (610–660°F)	<ul style="list-style-type: none"> Recyclable, also as monomaterial sandwich structure Achieves high surface finish Rapid processing with cycle times < 3 minutes Excellent FST performance (OSU < 15/15) 		○	○	○	○	○		○	○	○	○	○	○	○						○		○		
TC1200	PEEK Polyetheretherketone	343°C (649°F)	370–400°C (698–752°F)	<ul style="list-style-type: none"> Good high temperature properties Very good CAI properties 265 MPa (38.4 ksi) Ideal for structural applications 	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○						○	○	○	
TC1225	LMPAEK Low-Melt Polyaryletherketone	305°C (581°F)	340–385°C (644–725°F)	<ul style="list-style-type: none"> Lower processing temperature with good high temperature performance May be overmolded with PEEK for final part Very good CAI properties 282 MPa (40.9 ksi) Ideal for structural applications 	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○						○	○	○	
TC1320	PEKK Polyetherketoneketone	337°C (639°F)	370–400°C (698–752°F)	<ul style="list-style-type: none"> Outstanding solvent and impact resistance Very high CAI properties 337 MPa (48.9 ksi) Ideal for structural applications Lower processing temperature material 	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○						○		○

Thermoplastic

Thermoplastic

	RESIN	NEAT RESIN DRY T _g ONSET	T _g PEAK	TYPICAL CURE TEMPERATURE AND TIME	KEY PRODUCT CHARACTERISTICS		OUT LIFE # DAYS	FREEZER LIFE # MONTHS	PROCESSING					PRODUCT ATTRIBUTES						MARKET SEGMENTS							
									OOA / VBO	AUTOCLAVE	PRESS FORMING	AFP / ATL	POST CURABLE	TOUGHENED	FLAME RETARDANT	CHEMICAL RESISTANT	CORROSION RESISTANT	IMPACT RESISTANT	HIGH TEMPERATURE PERFORMANCE	LOW MOISTURE ABSORPTION	LOW TEMPERATURE CURE	AEROSPACE					
																						AEROSTRUCTURES	SPACE AND SATELLITE	LAUNCH	RADOMES	AIRCRAFT INTERIORS	ENGINES / HIGH TEMP
HX40	Epoxy	203°C (397°F)	229°C (444°F)	65°C (149°F) 12 hours	<ul style="list-style-type: none"> Extended out life for larger scale tooling applications High temperature end use performance Versatile curing options 50–75°C (122–167°F) 		8	12		○								○	○	○	○	○	○	○	○		
HX42	Epoxy	219°C (426°F)	234°C (453°F)	60°C (140°F) 8 hours	<ul style="list-style-type: none"> Proven system for aerospace Shorter cure schedule at lower temperatures Available in carbon reinforcements from 205gsm to 990gsm Excellent surface finish 210°C (410°F) end use temperature 		5	12		○								○	○	○	○			○			
HX56	Epoxy	185°C (365°F)	209°C (408°F)	55°C (131°F) 6 hours	<ul style="list-style-type: none"> Fast cure and excellent surface finish Improved handleability Available in carbon reinforcements from 205gsm to 990gsm Excellent drape for complex shapes 180°C (356°F) end use temperature 		60 hours	6		○								○						○			



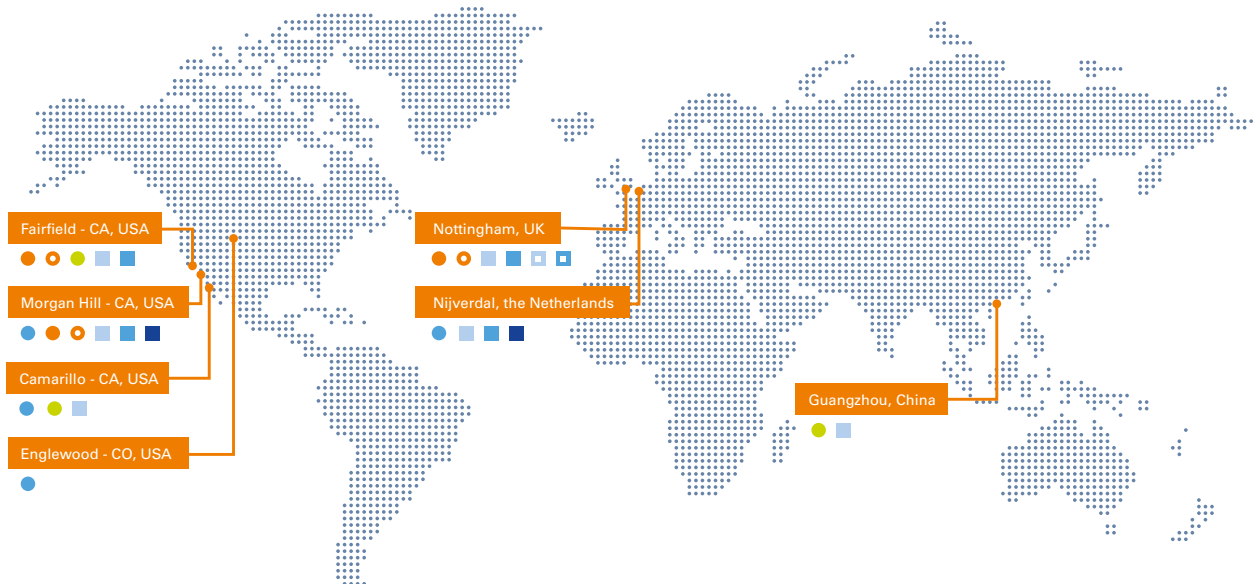
Locations and Capabilities

SOLUTIONS

- Thermoplastic composites
- Carbon-free manufacturing
- Thermoset composites
- Parts manufacture

CERTIFICATIONS

- ISO 9001:2015
- AS9100D
- AC7124
- ISO 14001:2015
- ISO 45001:2018



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