

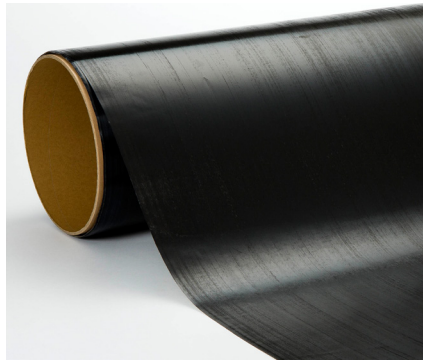


Toray Composite Materials America, Inc.

AEROSPACE PRODUCT SELECTOR GUIDE



Aerospace Product Selector Guide



Toray Composite Materials America, Inc. is a leading innovator and manufacturer of TORAYCA™ carbon fiber and prepreg systems serving the aerospace, defense, and space markets. Our materials are known for their outstanding performance, quality, and consistency in processing. They have proven invaluable to the market, offering improvements in impact and fatigue performance, strength, and weight.

Toray's composite materials meet the requirements of aerospace manufacturers for primary and secondary structure components. Our products played a primary role in enabling the large-scale adoption of composite materials in the aerospace industry and have been used in multiple aerospace applications for over 25 years.

Prepreg

Toray's wide range of prepregs uses specially-formulated epoxy and BMI resins combined with TORAYCA™ carbon fiber and other woven carbon and glass fibers. Our toughened prepregs provide a range of matrices with excellent all-around structural properties and high wet and dry Tg while offering flexible cure profiles. These are available in a variety of configurations, can be purchased to Aerospace Material Specifications (AMS), and have FAA-approved design allowable values.

Carbon Fiber

TORAYCA™ carbon fibers represent the most comprehensive selection available in the market, with the highest standards of quality and performance. Our range of standard modulus, intermediate modulus, and high modulus fibers have excellent processability in traditional manufacturing methods such as weaving, braiding, filament winding, and prepreg.

PREPREG PROPERTIES

RESIN NAME	CURE TEMP. (°F)	MINIMUM CURE TIME (MINUTES)	CURE PROCESS			Tg DRY (°F)	OUT LIFE AT 72°F (DAYS)	STORAGE LIFE ≤10°F (MONTHS)	FIBER	FORMAT	SPEC#	PART#	CONVERSION FACTORS			
			AUTOCLAVE	OUT OF AUTOCLAVE	PRESS MOLDING								SQM	SQFT	KG	LBS
2510	270	120	●	●		294	28	24	Carbon / T700G-12K	UD	AMS 3960†	P707AG-15	1	10.7639	0.2308	0.5088
									Carbon / T700S-12K	PW	AMS 3914†	F6273C-07M	1	10.7639	0.3328	0.7336
									Fiberglass / E- Glass	7781 8HS	AMS 3915†	FGF7781-07I	1	10.7639	0.4742	1.0454
2511	270	120		●		309	28	24	Carbon / T700G-12K	UD	-	P711AG-15	1	10.7639	0.2308	0.5088
									Carbon / T700S-12K	PW	‡	F6273C-11M	1	10.7639	0.3328	0.7336
									Fiberglass / E- Glass	7781 8HS	-	FGF7781-11I	1	10.7639	0.4742	1.0454
2700	270	30	●	●	●	TBD	28	24	Carbon / T700S-12K	PW	-	Contact Sales	1	10.7639	0.3328	0.7336
3900	350	120	●		●	400	10	24	Carbon / T800S-24K	UD	AMS 6891/1‡	P2362W-19L	1	10.7639	0.2961	0.6528
									Carbon / T830H-6K	PW	AMS 6891/2‡	FM6673G-37KL	1	10.7639	0.3267	0.7202
									Carbon / T400H-3K	PW	-	FJ6361F-30HT	1	10.7639	0.3063	0.6754
									Fiberglass / E- Glass	108 PW	AMS 6891/4‡	FGF108-29ML	1	10.7639	0.0819	0.1805
									Fiberglass / E- Glass	7781 8HS	AMS 6891/3‡	FGF7781-29E	1	10.7639	0.4455	0.982
3960	350	120	●	●	●	385	40	24	Carbon / T1100G-24K	UD	NMS 397/1	P173EBN-19	1	10.7639	0.2887	0.6365
									Carbon / T1100G-12K	UD	-	P173E0N-7	1	10.7639	0.1167	0.2572
									Carbon / T1100G-12K	PW	NMS 397/2	FT6243R-3EF	1	10.7639	0.3015	0.6648
4000	440	240	●			484	35	12	Carbon / T1100G-12K	UD	-	Contact Sales	1	10.7639	TBD	TBD

†: AGATE B-basis allowable database <http://www.niar.wichita.edu/agate/Documents/default.htm>
‡: CMH-17 B-basis allowable database, approved Yellow Pages available upon request.
NCAMP NMS products in qualification testing, batch data available upon request.

FEATURES AND BENEFITS

PREPREG SYSTEM	PROCESSING DATABASE	HIGH Tg ≤180 USE TEMP	HIGH Tg ≤250 USE TEMP	EXCELLENT IMPACT RESISTANCE	SEMI-TOUGHENED	HIGHLY-TOUGHENED	FLEXIBLE CURE OPTIONS
2510	■	●			●		●
2511	■	●		●	●		●
2700		●	●	●	●		●
3900	■		●	●		●	●
3960	■		●	●		●	●
4000		●	●	●		●	●

■ RAVEN and COMPRO 2D processing database

TORAYCA™ TYPICAL FIBER PROPERTIES

(Nominal Values)

FIBER TYPE		NUMBER OF FILAMENTS	SIZING TYPE	TENSILE STRENGTH*		TENSILE MODULUS*		ELONGATION (%)	YIELD (g/1000m)	DENSITY (g/cm³)
				(ksi)	(MPa)	(Msi)	(GPa)			
STANDARD MODULUS	T300	1,000	4,5	512	3,530	33.4	230	1.5	66	1.76
		3,000	4,5						198	
		6,000	4,5						396	
	T400H	3,000	4	640	4,410	36.3	250	1.8	198	1.80
		6,000	4						396	
	T700S ■	6,000	5	711	4,900	33.4	230	2.1	396	1.80
		12,000	5, 6, F						800	
		24,000	5, 6, F						1,650	
	T700G ■	12,000	3, 4, 5	711	4,900	34.8	240	2.0	800	1.80
INTERMEDIATE MODULUS	T800H	6,000	4	796	5,490	42.7	294	1.9	223	1.81
		12,000	4,5						445	
	T830H	6,000	4	774	5,340	42.7	294	1.8	223	1.81
	T800S ■	12,000	5	853	5,880	42.7	294	2.0	515	1.80
		24,000	1						1,030	
	T1000G	12,000	4	924	6,370	42.7	294	2.2	485	1.80
	T1100S ■	12,000	5	1,017	7,000	47.0	324	2.0	505	1.79
		24,000	5						1,010	
	T1100G ■	12,000	7	1,017	7,000	47.0	324	2.0	505	1.79
		24,000	7						1,010	
HIGH MODULUS	M35J	6,000	5	654	4,510	49.8	343	1.3	225	1.75
		12,000	5	683	4,700			1.4	450	
	M40J	6,000	5	640	4,400	54.7	377	1.2	225	1.77
		12,000	5						450	
	M46J	6,000	5	609	4,200	63.3	436	1.0	223	1.84
		12,000	5	583	4,020			0.9	445	
	M55J	6,000	5	583	4,020	78.2	540	0.8	218	1.91
	M60J	3,000	5	554	3,820	85.3	588	0.7	103	1.93
		6,000	5						206	

■ Manufactured in the U.S.

*Measured using the impregnated strand method. This information can be used for material selection purposes only.

ANCILLARY PRODUCTS

E-09 Tackifier

Compatible with all 350°F curing systems. This can be applied to tooling of all types to improve first ply adhesion to the surface. It works well for both complex tools and radii in hand layup as well as low tack material used in AFP, and may be used on top of tool release agents.

F-01 Tackifier Film

This 927mm wide resin film is compatible with all 350°F curing resin systems. It is easy to apply and works best for large tools with minimal curvature. Solvent is not needed for use.

Same Qualified Resin Transfer Molding (SQRTM)

SQRTM is a resin transfer molding (RTM) process where prepreg charges are placed in closed molds and injected with additional resin during cure to ensure a net-shape part. This SQRTM resin is formulated to be compatible with all 350°F curing resin systems.

Peel Ply

TORAYCA™ 350°F cure peel ply is a polyester fabric combined with our 3900 resin system at 45% resin content. The added resin prevents the peel ply fabric from wicking resin away from structural plies, which improves laminate fiber volume predictability and control. The peel ply can be applied to the outer layer of a laminate before curing, cured, and removed to provide a roughened surface that allows for better mechanical adhesion during bonding.

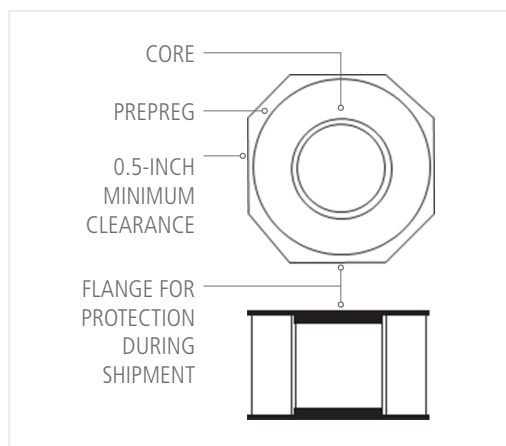
Surfacing Materials

Scrims, corrosion barrier plies, lightning strike protection, and other surfacing materials are available for all resin systems. Contact us for more information.

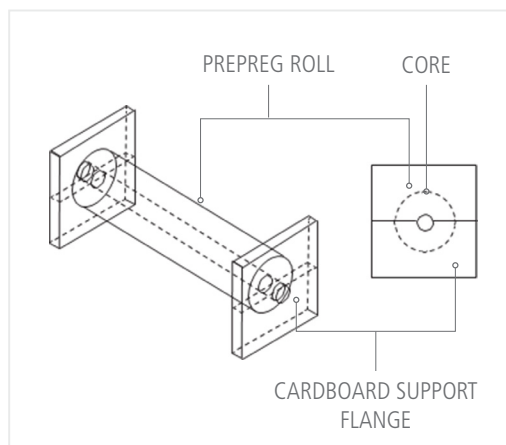
PACKAGING GUIDE

- Rolls are vacuum sealed in clean, non-contaminating, 0.006-inch minimum thickness polyethylene moisture-proof bags.
- Bags contain a desiccant in accordance with MIL-D-3464, Type II.
- A label is located inside the core, to the exterior of the prepreg shipping bag and outside the carton case.
- Attachment of the Purchase Order No., date of shipment and copies of the defect log are included per customer requirements.

Packaging Configuration for Products 12 Inches or Less in Width



Packaging Configuration for Products Greater than 12 Inches in Width





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