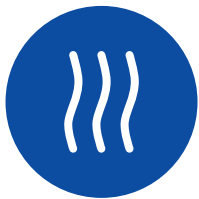
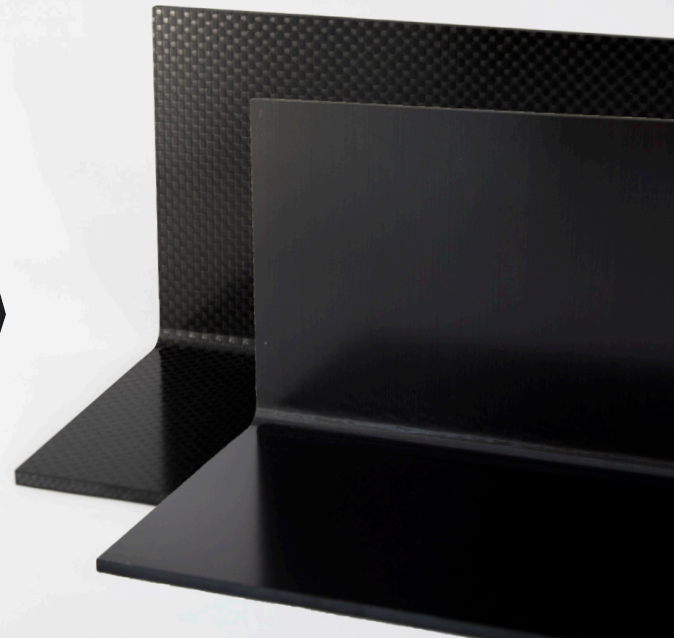




Toray Composite Materials America, Inc.

3960 PREPREG SYSTEM

Toray's next-generation #3960 prepreg system demonstrates the next leap in performance of aerospace materials. Complementary pairing of the #3960 resin system with state-of-the-art T1100G carbon fiber provides the unparalleled properties expected of materials for the future. High toughness, exceptional tensile performance, and retention of hot/wet performance to 250°F (121°C) make the #3960 system the clear choice for the future demands of the aerospace industry.



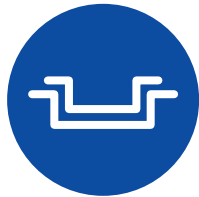
High Heat Tolerance

High Tg and hot/wet performance enable retention of critical properties like open-hole compression to 121°C (250°F) without compromising material toughness.



Resin Chemistry

System features synergy with T1100G, capturing fiber's full capability and maximizing translation of carbon fiber strand strength.



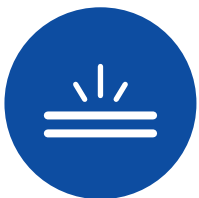
Flexible Cure Methods

Proven flexibility in curing and consistency in mechanical properties has been achieved by oven cure and autoclave, with or without an intermediate dwell.



Flexible Processing

Prepreg can be suitably processed in either AFP or hand lay-up methodologies.



Laminate Toughness

Toray's proven interlayer toughening technology sets the standard for laminate impact resistance and fracture toughness.



AVAILABLE PRODUCT FORMATS

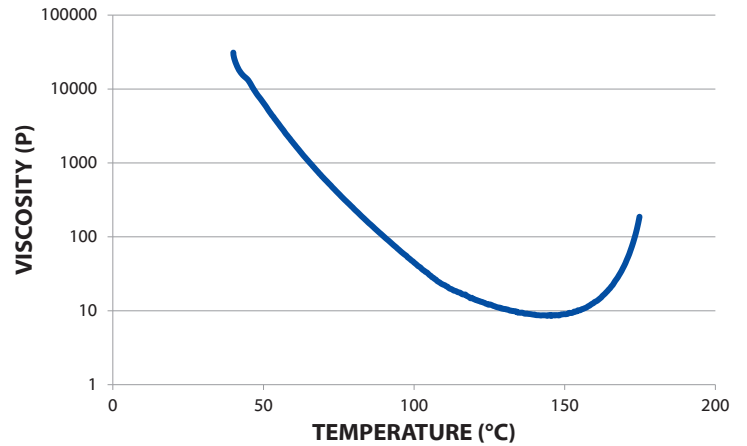
PART NUMBER	FIBER FORMAT	FIBER TYPE/STYLE	FAW (GSM)	RC % WEIGHT	ROLL WIDTH (IN)
P173EBN-19	Unidirectional	T1100G	192	33.5	60/39/36/12/6/0.5/0.25
FT62YER-3EI	Plain Weave	T1100G-12K	196	38.0	38

NEAT RESIN PHYSICAL PROPERTIES

PROPERTY	METHOD	UNITS	VALUE
Density	ASTM D595	g/cc	1.274
Tg (Dry)	DMA	°F (°C)	391 (199)
Tg (Wet)	DMA	°F (°C)	328 (165)

Wet conditioning : 160°F/85% RH until equilibrium

RESIN VISCOSITY CURVE



Please refer to SDS for handling and disposal.

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LAMINA/LAMINATE MECHANICAL PROPERTIES: UD T1100G

PROPERTY	SYMBOL	METHOD	UNITS	AUTOCLAVE			OVEN		
				CTA	RTA	ETW	CTA	RTA	ETW
0° Tensile Strength	F _{1t}	ASTM D3039	Ksi (MPa)	-	551 (3797)	-	511 (3523)	534 (3682)	-
90° Tensile Strength	F _{2t}	ASTM D3039	Ksi (MPa)	-	-	-	11.4 (78)	11.4 (79)	-
0° Tensile Modulus	E _{1t}	ASTM D3039	Msi (GPa)	-	25.1 (173)	-	25.2 (174)	25.0 (172)	-
90° Tensile Modulus	E _{2t}	ASTM D3039	Msi (GPa)	-	-	-	1.5 (10)	1.3 (9.3)	-
0° Compressive Strength	F _{1c}	ASTM D6641	Ksi (MPa)	-	232 (1599)	102 (701)	221 (1523)	229 (1576)	-
90° Compressive Strength	F _{2c}	ASTM D6641	Ksi (MPa)	-	37 (252)	-	49 (340)	38 (265)	-
0° Compressive Modulus	E _{1c}	ASTM D6641	Msi (GPa)	-	21.9 (151)	21.1 (146)	22.1 (153)	22.3 (154)	-
90° Compressive Modulus	E _{2c}	ASTM D6641	Msi (GPa)	-	-	-	1.5 (11)	1.4 (10)	-
In-Plane Shear Strength @Ultimate	F ₁₂	ASTM D5379	Ksi (MPa)	-	13.5 (93)	8.7 (60)	15.2 (105)	12.1 (84)	-
In-Plane Shear Modulus	G ₁₂	ASTM D5379	Msi (GPa)	-	0.7 (5.0)	0.5 (3.5)	1.3 (9.0)	0.7 (5.0)	-
Short Beam Shear Strength	SBS	ASTM D2344	Ksi (MPa)	23.1 (160)	16.7 (115)	-	23.9 (165)	17.2 (119)	-
Open Hole Tension Strength (25/50/25)	OHT	ASTM D5766	Ksi (MPa)	90 (623)	102 (702)	-	90 (619)	95 (656)	-
Open Hole Compression Strength (25/50/25)	OHC	ASTM D6484	Ksi (MPa)	-	48 (331)	36 (244)	56 (383)	49 (337)	37 (252)
Compression After Impact (25/50/25) Impact at 270in-lbs (6.7J/mm)	CAI	ASTM D7137	Ksi (MPa)	-	48 (331)	-	-	45 (310)	-
Laminate Density	ρ	-	g/cc	1.573					
Fiber Volume Fraction	V _f	ASTM D792	%	56.8					
Cured Ply Thickness	CPT	-	Inch (mm)	0.0072 (0.18)			0.0073 (0.19)		

Tension and compression values are normalized to the indicated V_f herein.

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LAMINA/LAMINATE MECHANICAL PROPERTIES: PW T1100G-12K

PROPERTY	SYMBOL	METHOD	UNITS	OVEN		
				CTA	RTA	ETW
0° Tensile Strength	F_{1t}	ASTM D3039	Ksi (MPa)	216 (1489)	220 (1519)	-
90° Tensile Strength	F_{2t}	ASTM D3039	Ksi (MPa)	208 (1435)	218 (1501)	-
0° Tensile Modulus	E_{1t}	ASTM D3039	Msi (GPa)	12.4 (86)	12.0 (83)	-
90° Tensile Modulus	E_{2t}	ASTM D3039	Msi (GPa)	12.2 (84)	12.7 (87)	-
0° Compressive Strength	F_{1c}	ASTM D6641	Ksi (MPa)	125 (863)	128 (880)	-
90° Compressive Strength	F_{2c}	ASTM D6641	Ksi (MPa)	132 (908)	129 (889)	-
0° Compressive Modulus	E_{1c}	ASTM D6641	Msi (GPa)	11.9 (82)	10.7 (74)	-
90° Compressive Modulus	E_{2c}	ASTM D6641	Msi (GPa)	10.7 (74)	11.0 (76)	-
Short Beam Shear Strength	SBS	ASTM D2344	Ksi (MPa)	14.1 (97)	12.9 (89)	-
Open Hole Tension Strength (25/50/25)	OHT	ASTM D5766	Ksi (MPa)	79 (545)	82 (563)	-
Open Hole Compression Strength (25/50/25)	OHC	ASTM D6484	Ksi (MPa)	51 (351)	46 (318)	36 (245)
Compression After Impact (25/50/25) Impact at 270in-lbs (6.7J/mm)	CAI	ASTM D7137	Ksi (MPa)	-	45 (313)	-
Laminate Density	ρ	-	g/cc	1.551		
Fiber Volume Fraction	V_f	ASTM D792	%	52.8		
Cured Ply Thickness	CPT	-	Inch (mm)	0.0079 (0.20)		

Tension and compression values are normalized to the indicated V_f herein.

Note:

CTA: -75°F (-60°C), Ambient

RTA: 72°F (22°C), Ambient

ETW: 250°F (121°C) Ambient, Conditioned at 160°F/85% RH until equilibrium

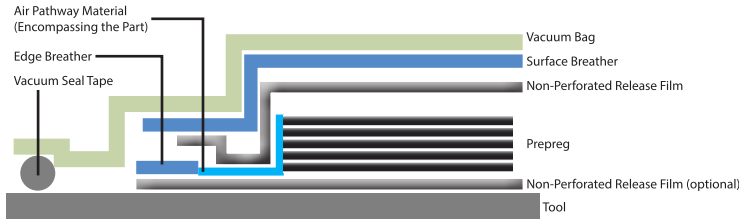
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Updated November 8, 2017

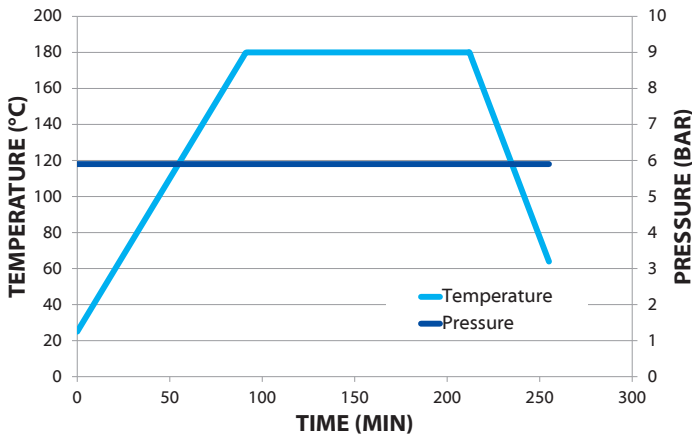
BAGGING PROCEDURE



CURE CYCLE - AUTOCLAVE

1. Apply vacuum of 22 inHg (560 mmHg) minimum.
2. Apply 85 +10/-0 psi (5.9 +0.7/-0 bar) of pressure to the laminate.
3. Vent the vacuum bag to atmospheric pressure once the pressure reaches 20 psi (1.4 bar).
4. Heat the part temperature to 355 ±10°F (180 ±5°C) at a ramp rate of 1.0 to 5.0°F/min (0.5 to 2.7°C/min).
5. Hold for 120 +30/-0 minutes at 355 ±10°F (180 ±5°C).
6. Under pressure, cool to 150°F (65°C) or lower at a maximum ramp rate of 5°F/min (2.7°C/min).

AUTOCLAVE CURE PROCESS



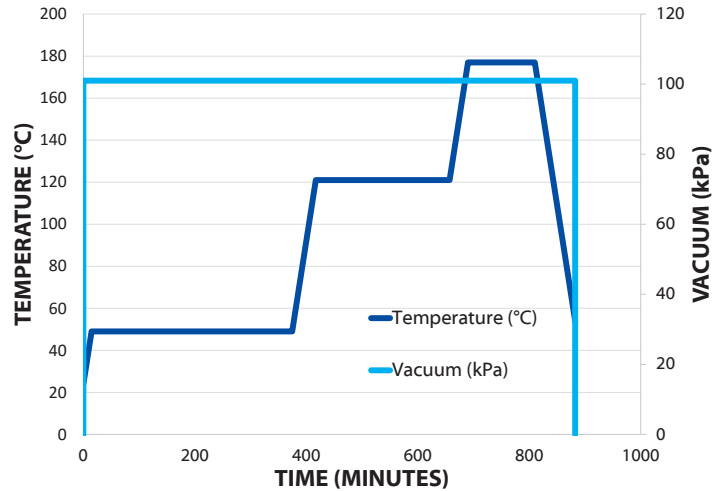
STORAGE LIFE

Out Life	42 days @ 75 °F
Freezer Life	2 years @ <10 °F

CURE CYCLE - OVEN

1. Apply vacuum of 28 inHg (710 mmHg) minimum, and maintain for at least three hours prior to beginning cure cycle.
2. Heat the part temperature to 250 ±10°F (120 ±5°C) at a ramp rate of 1.0 to 5.0°F/min (0.5 to 2.7°C/min).
3. Hold for 240 +30/-0 minutes at 250 ±10°F (120 ±5°C).
4. Heat the part temperature to 355 ±10°F (180 ±5°C) at a ramp rate of 1.0 to 5.0°F/min (0.5 to 2.7°C/min).
5. Hold for 120 +30/-0 minutes at 355 ±10°F (180 ±5°C).
6. Cool to 150°F (65°C) or lower at a maximum ramp rate of 5°F/min (2.7°C/min).

OVEN CURE PROCESS



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