



Toray Composite Materials America, Inc.

3900 PREPREG SYSTEM

3900-series prepregs are highly-toughened 350°F (177°C) cure systems. It is available in a variety of configurations, including unidirectional tape for manual or automated tape laying applications, slit-tape-tow for automated fiber placement applications, and plain-weave carbon and glass fabrics.



Mechanically Stable

Mechanical working life of product is over 40 days, allowing for lay-up of large parts.



Readily Available

Product is in stock and ready to ship.



Highly Toughened

High strength fiber is combined with particulate interlayer toughening to reduce delamination and increase fracture toughness, impact resistance, and environmental resistance.



Proven Technology

Products have been used successfully in multiple applications, including aircraft primary structures, for over 25 years.



Consistency

Uniform resin content and a no-bleed resin system allows for predictable thicknesses and parts.



Customizable Forms

Compatible with multiple applications, including AFP, ATL, and hand layup. Multiple widths and roll configurations available.



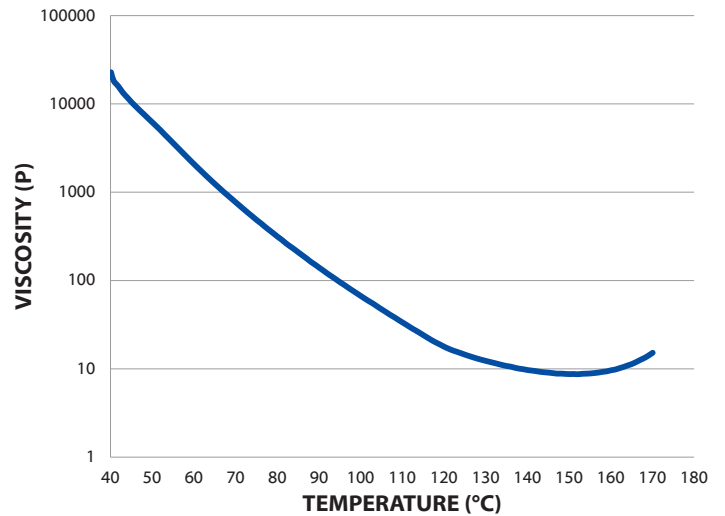
AVAILABLE PRODUCT FORMATS

PART NUMBER	FIBER FORMAT	FIBER TYPE/STYLE	FAW (GSM)	RC % WEIGHT	ROLL WIDTH (IN)
P2362W-19	Unidirectional	T800S	192	35.5	60, 36, 24, 12, 6, 3, 0.5, 0.25, 0.125
FGF108-29M	Glass Fabric	108	47.5	42.0	39
FGF7781-29E	Glass Fabric	7781	294	34.0	38
FM6673G-37KL	Plain Weave	T830H-6K	196	40.0	38, 12, 9
FJ6361F-30HT	Plain Weave	T400H-3K	193	37.0	38

NEAT RESIN PHYSICAL PROPERTIES

PROPERTY	METHOD	UNITS	VALUE
Density	ASTM D595	g/cc	1.220-1.250
Tg (Dry)	DMA	°F(°C)	400F (204C)
Tg (Wet)	DMA	°F(°C)	330F (166C)
Gel Time	ASTM D3532	Minutes	5-31
K _{1C}	ASTM D5045	ksi*in ^{0.5} (MPa*m ^{0.5})	1.54 (1.69)

RESIN VISCOSITY CURVE



Please refer to SDS for handling and disposal.

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LAMINA/LAMINATE MECHANICAL PROPERTIES: UD T800S-24K - COMMERCIAL READY

PROPERTY	SYMBOL	METHOD	UNITS	CTA	RTA
0° Tensile Strength	F _{1t}	ASTM D3039	ksi (MPa)	410 (2830)	430 (2965)
90° Tensile Strength	F _{2t}	ASTM D3039	ksi (MPa)	8.25 (56.9)	8.75 (60.3)
0° Tensile Modulus	E _{1t}	ASTM D3039	Msi (GPa)	21.5 (148)	21.5 (148)
90° Tensile Modulus	E _{2t}	ASTM D3039	Msi (GPa)	1.40 (9.7)	1.20 (8.3)
0° Compressive Strength	F _{1c}	ASTM D6641	ksi (MPa)	257 (1772)	258 (1779)
90° Compressive Strength	F _{2c}	ASTM D6641	ksi (MPa)	44.0 (303)	31.0 (214)
0° Compressive Modulus	E _{1c}	ASTM D6641	Msi (GPa)	19.0 (131)	19.0 (131)
90° Compressive Modulus	E _{2c}	ASTM D6641	Msi (GPa)	1.40 (9.7)	1.20 (8.3)
In-Plane Shear Strength @ 5% or Ultimate	F ₁₂	ASTM D3518	ksi (MPa)	13.0 (89.6)	10.0 (68.9)
In-Plane Shear Modulus	G ₁₂	ASTM D3518	Msi (GPa)	0.700 (4.83)	0.570 (3.93)
Short Beam Shear Strength	SBS	ASTM D2344	ksi (MPa)	20.0 (138)	14.0 (96.5)
Poisson's Ratio	v ₁₂	ASTM D3039	-	-	0.33
Poisson's Ratio	v ₂₁	ASTM D3039	-	-	0.02
Open Hole Tension Strength (25/50/25)	OHT	ASTM D5766	ksi (MPa)	-	73 (503)
Open Hole Compression Strength (25/50/25)	OHC	ASTM D6484	ksi (MPa)	-	43 (296)
Compression After Impact (25/50/25)	CAI	ASTM D7137	ksi (MPa)	-	42
Cured Ply Thickness	CPT	-	in. (mm)	0.0075 (0.191)	

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

Notes:

CTA: -65°F (-54°C), Ambient

RTA: 72°F (22°C), Ambient

ETW: 180°F (82°C) Ambient, Conditioned at 160°F/85% RH until equilibrium

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LAMINA/LAMINATE MECHANICAL PROPERTIES: PW T830H-6K - COMMERCIAL READY

PROPERTY	SYMBOL	METHOD	UNITS	CTA	RTA
0° Tensile Strength	F_{1t}	ASTM D3039	ksi (MPa)	-	153 (1055)
90° Tensile Strength	F_{2t}	ASTM D3039	ksi (MPa)	130 (896)	137 (945)
0° Tensile Modulus	E_{1t}	ASTM D3039	Msi (GPa)	-	10.2 (70.3)
90° Tensile Modulus	E_{2t}	ASTM D3039	Msi (GPa)	10.0 (68.9)	10.0 (68.9)
0° Compressive Strength	F_{1c}	ASTM D6641	ksi (MPa)	113 (779)	98.0 (676)
90° Compressive Strength	F_{2c}	ASTM D6641	ksi (MPa)	100 (689)	89.0 (614)
0° Compressive Modulus	E_{1c}	ASTM D6641	Msi (GPa)	10.3 (71.0)	9.50 (65.5)
90° Compressive Modulus	E_{2c}	ASTM D6641	Msi (GPa)	9.80 (67.6)	9.10 (62.7)
In-Plane Shear Strength @ 5% or Ultimate	F_{12}	ASTM D3518	ksi (MPa)	17.5 (121)	11.5 (79.3)
In-Plane Shear Modulus	G_{12}	ASTM D3518	Msi (GPa)	0.660 (4.6)	0.520 (3.6)
Short Beam Shear Strength	SBS	ASTM D2344	ksi (MPa)	15.0 (103)	10.5 (72.4)
Poisson's Ratio	ν_{12}	ASTM D3039	-	-	0.032
Poisson's Ratio	ν_{21}	ASTM D3039	-	-	0.038
Open Hole Tension Strength (25/50/25)	OHT	ASTM D5766	ksi (MPa)	-	50 (345)
Open Hole Compression Strength (25/50/25)	OHC	ASTM D6484	ksi (MPa)	-	42 (290)
Compression After Impact (25/50/25)	CAI	ASTM D7137	ksi (MPa)	-	48 (331)
Cured Ply Thickness	CPT	-	in. (mm)	0.0086 (0.218)	

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

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LAMINA/LAMINATE MECHANICAL PROPERTIES: PW T400H-3K

PROPERTY	SYMBOL	METHOD	UNITS	CTA	RTA	ETW
0° Tensile Strength	F _{1t}	ASTM D3039	ksi (MPa)	113 (779)	135 (931)	156 (1076)
90° Tensile Strength	F _{2t}	ASTM D3039	ksi (MPa)	108 (745)	122 (841)	139 (958)
0° Tensile Modulus	E _{1t}	ASTM D3039	Msi (GPa)	9.70 (66.9)	9.70 (66.9)	9.80 (67.6)
90° Tensile Modulus	E _{2t}	ASTM D3039	Msi (GPa)	9.60 (66.2)	9.60 (66.2)	9.60 (66.2)
0° Compressive Strength	F _{1c}	ASTM D695	ksi (MPa)	139 (958)	117 (807)	86 (593)
90° Compressive Strength	F _{2c}	ASTM D695	ksi (MPa)	129 (889)	106 (731)	83 (572)
0° Compressive Modulus	E _{1c}	ASTM D695	Msi (GPa)	8.90 (61.4)	8.60 (59.3)	9.10 (62.7)
90° Compressive Modulus	E _{2c}	ASTM D695	Msi (GPa)	8.70 (60.0)	8.70 (60.0)	8.90 (61.4)
In-Plane Shear Strength @ 5% or Ultimate	F ₁₂	ASTM D5379	ksi (MPa)	20 (138)	22 (152)	9.2 (63)
In-Plane Shear Modulus	G ₁₂	ASTM D5379	Msi (GPa)	0.738	0.570	0.466
Short Beam Shear Strength	SBS	ASTM D2344	ksi (MPa)	-	11 (76)	7.2 (50)
Poisson's Ratio	v ₁₂	ASTM D3039	-	-	0.057	-
Poisson's Ratio	v ₂₁	ASTM D3039	-	-	0.067	-
Open Hole Tension Strength (25/50/25)	OHT	ASTM D5766	ksi (MPa)	44 (303)	47 (324)	51 (352)
Open Hole Compression Strength (25/50/25)	OHC	ASTM D6484	ksi (MPa)	50 (345)	43 (296)	34 (234)
Compression After Impact (25/50/25) 1500 in-lb/in Dynatup	CAI	ASTM D7137	ksi (MPa)	44.6 (308)	40.3 (278)	32.4 (223)
Fiber Volume Fraction	V _f	ASTM D3171	%	-	53.6 (370)	-
Cured Ply Thickness	CPT	-	in. (mm)	0.0080 (0.202)		

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

Notes:

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ETW: 180°F (82°C) Ambient, Conditioned at 145°F/85% RH until equilibrium

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LAMINA/LAMINATE MECHANICAL PROPERTIES: GF STYLE 7781

PROPERTY	SYMBOL	METHOD	UNITS	CTA	RTA	ETW
0° Tensile Strength	F_{1t}	ASTM D3039	ksi (MPa)	84.8 (585)	64.1 (442)	49.3 (340)
90° Tensile Strength	F_{2t}	ASTM D3039	ksi (MPa)	69.9 (482)	50.4 (347)	42.4 (292)
0° Tensile Modulus	E_{1t}	ASTM D3039	Msi (GPa)	3.70 (25.5)	3.42 (23.6)	3.15 (21.7)
90° Tensile Modulus	E_{2t}	ASTM D3039	Msi (GPa)	3.52 (24.2)	3.30 (22.7)	2.93 (20.2)
0° Compressive Strength	F_{1c}	SACMA SRM 1R-94	ksi (MPa)	88.4 (609)	76.2 (526)	50.9 (351)
90° Compressive Strength	F_{2c}	SACMA SRM 1R-94	ksi (MPa)	78.8 (543)	65.4 (451)	43.1 (297)
In-Plane Shear Strength @ 5% or Ultimate	F_{12}	ASTM D5379	ksi (MPa)	23.7 (164)	18.4 (127)	11.6 (80.3)
In-Plane Shear Modulus	G_{12}	ASTM D5379	Msi (GPa)	0.72 (4.96)	0.63 (4.37)	0.46 (3.15)
Poisson's Ratio	ν_{12}	ASTM E132	-	-	0.14	-
Open Hole Tension Strength (25/50/25)	OHT	ASTM D5766	ksi (MPa)	-	24.8 (171)	20.7 (143)
Open Hole Compression Strength (25/50/25)	OHC	ASTM D6484	ksi (MPa)	-	36.3 (250)	27.9 (192)
Laminate Density	ρ	ASTM D792	g/cc	1.805		
Fiber Volume Fraction	V_f	-	%	54%		
Cured Ply Thickness	CPT	-	in. (mm)	0.0092 (0.234)		

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

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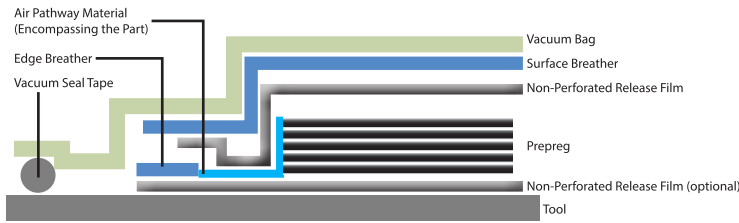
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BAGGING PROCEDURE



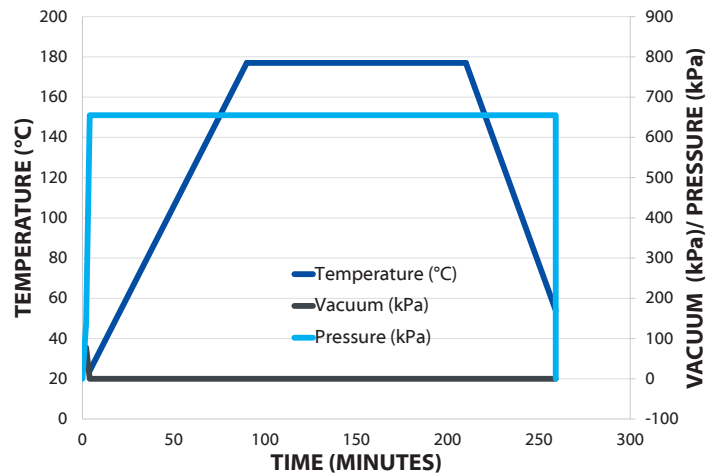
STORAGE LIFE

Out Life*	42 days @ 75 °F
Freezer Life	24 months @ <10 °F

*Tack and drape is optimum at 72F and 65% RH

CURE CYCLE - AUTOCLAVE

1. Apply full vacuum (minimum of 22" Hg (74.5 kPa) at sea level) to the vacuum bag assembly and check for leak prior to the beginning of the cure cycle. The leak rate shall be less than 2.0" Hg (6.77 kPa) over 5 minutes
2. Apply 85 + 15/-0 psi (586 + 103/-0 kPa) autoclave pressure to the laminate.
3. Vent the vacuum bag when the autoclave pressure reaches 20psi (138 kPa)
4. Apply the temperature ramp to 350 ± 10°F (177 ± 5°C) at rate of 3.0 ± 2.0 °F (1.7 ± 1.1°C) per minute.
5. Maintain the cure temperature at 350 ± 10°F (177 ± 5°C) for 120 - 180 minutes.
6. Cool vessel to 140°F (60°C) or lower at a maximum rate of 5°F (2.78°C) per minute before removing pressure.
7. Remove the bagged panels from the curing vessel.



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