CYCOM® 5216

CYCOM® 5216 is a 200°F-250°F (93°C-121°C) curing, modified epoxy resin with a service temperature range of -67 to 180°F (-55 to 82°C). This prepreg is manufactured by hot melt processing and is virtually solvent-free.

Typical applications include rotor blade spars and skins, aircraft secondary structures, engine nacelles, and areas where high impact resistant laminates are required.

Features and Benefits

- Excellent fatigue resistance
- High flow with long shop life
- Autoclave and press cure
- Maximum continuous service temperature up to 180°F (82°C)
- Low pressure moldable
- Good tack and drape characteristics
- Excellent translation of fiber strength
- Tape laying machine capable

CHARACTERISTICS

Table 1 | Physical Properties

Property	Value	Test Method
Cured Resin Density, g/cc	1.24	ASTM D 792
Resin Content, wt %	34	ASTM D 3529
Flow[1], wt %	16	ASTM D 3531
Volatiles, wt % max	0.3	ASTM D 3530
Gel time, minutes	4	ASTM D 3532
Shelf Life	6 months at or below 0°F (-18°C) from date of shipment 3 months at or below 40°F (4°C) from date of shipment	
Shop Life	30 days at or below 75°F (24°C)	

[1]: 250°F (121°C), 50 psi (345 KPa), Gel + 5 minutes

Table 2 | Product Availability

Property	Description
Unidirectional Tape Roll Width	Up to 48 in (122 cm) or slit to customer requirements
Woven Fabric Roll Width	Up to 60 in (152 cm) or slit to customer requirements
Roving Roll Width	To customer specification
Roll Length	60 yds (55 m)

Resin Viscosity

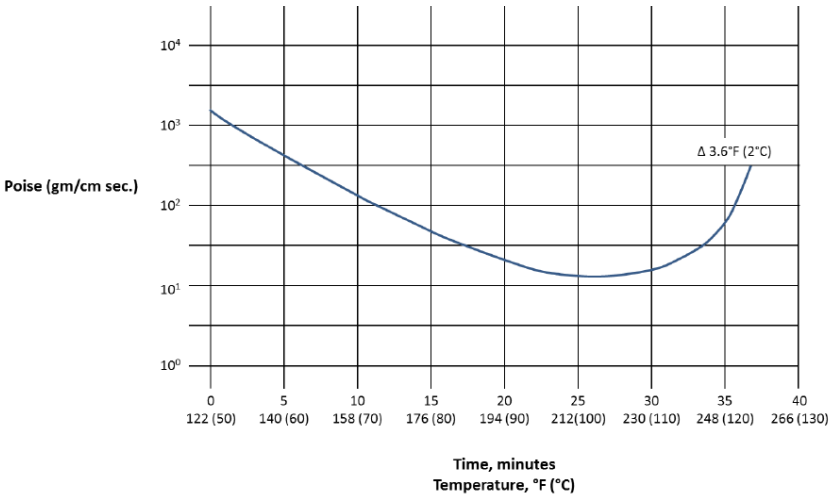

Figure 1 | CYCOM® 5216 Viscosity Profile

PROPERTIES

Table 3 | Mechanical Properties of CYCOM® 5216 with Unidirectional Glass Fiber

Property	Test Condition	S-Glass[1]	E-Glass[2]	Test Method
0° Tensile Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	284 (1958) 240 (1655) 206 (1420)	170 (1172) 143 (986) 123 (848)	ASTM D 638
0° Tensile Modulus Msi (GPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	6.4 (44) 6.3 (43) 6.4 (44)	5.9 (41) 5.7 (39) 5.6 (39)	ASTM D 638
0°/90° Tensile Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	137 (944) 137 (944) 94 (648)	89 (614) 64 (441) 66 (455)	ASTM D 638
0°/90° Tensile Modulus Msi (GPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	4.1 (28) 4.1 (28) 3.8 (26)	3.9 (27) 3.7 (26) 3.9 (27)	ASTM D 638
±45° Tensile Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	25 (172) 26 (179) 21 (145)	28 (193) 26 (179) 23 (159)	ASTM D 638
±45° Tensile Modulus msi (GPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	2.2 (15) 1.9 (13) 1.6 (11)	2.1 (14) 1.7 (12) 1.7 (12)	ASTM D 638
0° Flexural Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	250 (1724) 180 (1241) 136 (938)	192 (1324) 175 (1206) 160 (1103)	ASTM D 790
0° Flexural Modulus msi (GPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	7.0 (48) 6.5 (45) 6.4 (44)	5.4 (37) 5.9 (41) 5.8 (40)	ASTM D 790
0° Short Beam Shear Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	14.9 (103) 11.2 (77) 8.0 (55)	17.3 (119) 12.4 (85) 8.6 (59)	ASTM D 2344

[1]: 53% Fiber Volume
[2]: 60% Fiber Volume

Table 4 | Mechanical Properties of CYCOM® 5216 with Unidirectional Glass Fiber - Environmental Conditioning

Property	Test Temperature	Dry[1]	Oil Soak[2]	Water Boil[3]	Temperature Exposure[4]	Test Method
S-Glass						
0° Flexural Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	250 (1724) 180 (1241) 136 (938)	261 (1800) 180 (1241) 144 (993)	235 (1620) 165 (1138) 152 (1048)	221 (1524) 199 (1372) 175 (1206)	ASTM D 790
0° Flexural Modulus msi (GPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	7.0 (48) 6.5 (45) 6.4 (44)	6.3 (43) 7.1 (49) 6.3 (43)	6.4 (44) 6.1 (42) 6.9 (48)	7.7 (53) 7.4 (51) 7.8 (54)	ASTM D 790
0° Short Beam Shear Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	14.9 (103) 11.2 (77) 8.0 (55)	13.7 (94) 11.1 (76) 7.5 (52)	15.7 (108) 10.4 (72) 7.6 (52)	15.6 (107) 12.4 (85) 10.7 (74)	ASTM D 2344
E-Glass						
0° Flexural Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	192 (1324) 175 (1206) 160 (1103)	209 (1441) 162 (1117) 149 (1027)	199 (1372) 148 (1020) 145 (1000)	222 (1531) 198 (1365) 174 (1200)	ASTM D 790
0° Flexural Modulus msi (GPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	5.4 (37) 5.9 (41) 5.8 (40)	5.7 (39) 5.6 (39) 5.3 (36)	6.0 (41) 5.5 (38) 5.8 (40)	7.2 (50) 7.3 (50) 6.5 (45)	ASTM D 790
0° Short Beam Shear Strength ksi (MPa)	-65°F (-54°C) 75°F (24°C) 180°F (82°C)	17.3 (119) 12.4 (85) 8.6 (59)	17.7 (122) 13.0 (90) 9.0 (62)	17.7 (118) 11.6 (80) 8.2 (56)	20.0 (128) 14.4 (99) 12.9 (89)	ASTM D 2344

[1]: No Conditioning
[2]: Oil Soak = 7 days at 160°F (66°C) in MIL-H-83282
[3]: Water Boil = Boiled 2 hours in distilled water
[4]: Temperature Exposure = 1000 Hours at 180°F (82°C)

PROCESSING

Guidelines for Thawing Out

On Removal of sealed prepreg from 0°F (-18°C) storage, ensure that the material is allowed to thaw fully to room temperature prior to unsealing. This avoids condensation. Typically a 60 yd (55m) roll of prepreg requires about 8-12 hours to thaw.

Recommended Cure Cycle

Cure Cycle	Apply full vacuum, 24 in Hg (0.081 MPa) minimum. Apply 85 psi (0.58 MPa) positive pressure, vent vacuum at 25 psi (0.12 MPa). Heat from 75°F (24°C) to 175°F ± 5°F (79°C ± 3°C) at 4 - 6°F (2 - 3°C)/minute. Hold at 175°F (79°C) for 30 minutes. Heat from 175°F ± 5°F (79°C ± 3°C) to 260°F ± 10°F (127 ± 6°C) at 4 - 6°F (2 - 3°C)/minute. Hold at 260°F ± 10°F (127 ± 6°C) for 95 ± 5 minutes. Cool under pressure to below 140°F (60°C) at 5°F (3°C)/minute.

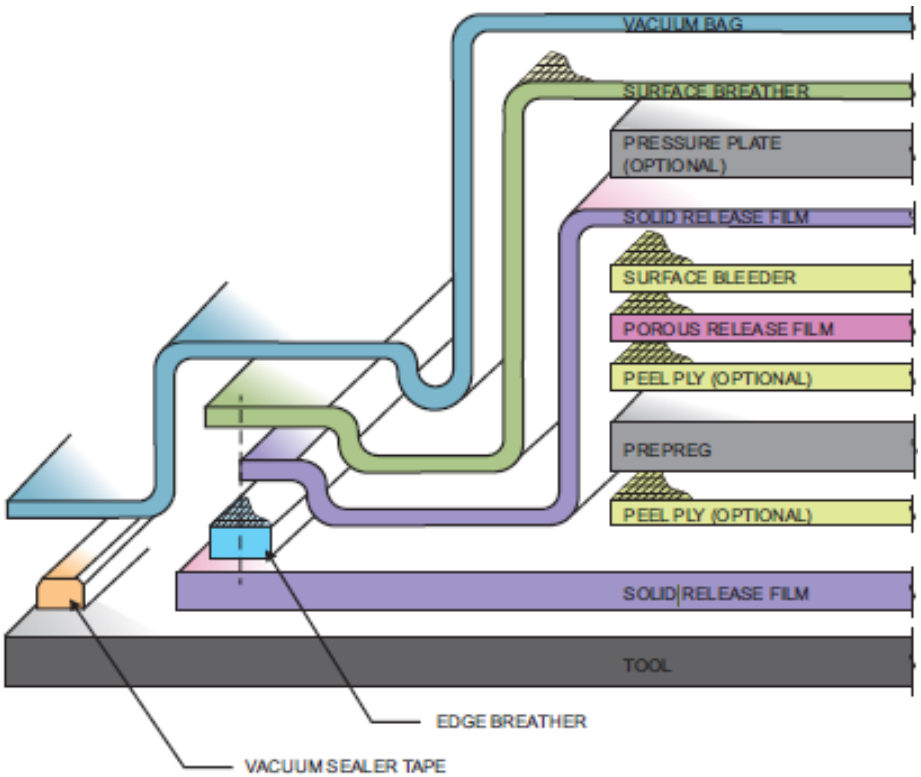

Figure 2 | Recommended Lay-up

Recommended Consumables

Table 5 below provides a list of consumable processing materials recommended for use with CYCOM® 5216.

Table 5 I Processing Materials

Sealant Tape	SM5142BY, SM 5127, SM5126
Release Film	A6200, A5000
Release Fabric	200 TFP, 200 TFNP
Breather/Bleeder Fabric	RC3000-10, A3000-4
Peel Ply	60001, 60002, 51789
Bagging Film	HS 8171, SV3000
Adhesive Tape	Flashtape 1, Flashtape 2

HEALTH & SAFETY

Please refer to the product SDS for safe handling, personal protective equipment recommendations and disposal considerations.