

307



250-300°F (120-150°C) Cure Epoxy Resin System

Typical applications

UAV spars
Marine masts
Wind blade spar-caps

Shelf life

6 months at 40°F (4°C)
12 months at 0°F (-18°C)

Out life

30 days at 70°F (21°C)

Description

307 is a 250-300°F (120-150°C) cure, highly toughened, controlled flow epoxy resin system specifically designed for thick parts. Versatile processing, excellent mechanical properties, and long out time make 307 suitable for a variety of applications.

Benefits/features

- Low exotherm
- Scorch-resistant
- High toughness
- Excellent mechanical properties

Application

The low exotherm properties of 307 make it an ideal product for UAV spars, marine masts, wind blade spar-caps, and other applications where very thick parts are required. It is well suited for low pressure, vacuum bag molding techniques.

307 can be supplied with most commercially available fibers (carbon, quartz, aramid, S-glass, E-glass, etc.) in both woven form (designated as NB) as well as unidirectional tape (designated as NCT).

Woven fabrics are available in standard commercial widths up to 60 inches (1.5 m). Unitape widths up to 39 inches (1 m) are available in standard fiber weights ranging from 70-300 gsm (0.014-0.060 psf).

Recommended processing conditions

307 is typically cured at 250-300°F (121-149°C) depending on part size and complexity. Low, medium and high pressure molding techniques may be used for curing. Recommended cure cycle is 50 psi (345 kPa); 3°F (1.7°C)/min ramp to 275°F (135°C); hold for 90-120 minutes, cool to <140°F (60°C).

Please contact your account manager or MCCFC technical support to discuss specific applications.

Neat resin [values are average and do not constitute a specification]

Property	Value
Gel time @ 275°F (135°C), minutes	11-18 minutes
Specific gravity	1.22
T _g (DMA, E'), °F (°C)	239 (115)
Tensile strength, ksi (MPa)	11.2 (77.2)
Tensile modulus, Msi (GPa)	0.429 (2.95)
Compressive strength, ksi (MPa)	16.9 (116)
Compressive modulus, Msi (GPa)	0.449 (3.09)

OUTGASSING PROPERTIES

34-700 carbon unitape, 35%RC, 150 gsm fiber area weight

Property	Test method	Value
Average value TML (Total mass loss)		0.28%
Average value WVR (Water vapor recovered)	ASTM E-595	0.09%
Percent CVCM (Collected volatile condensable materials)		<0.01

Mechanical data [values are average and do not constitute a specification]

HS40 CARBON UNITAPE

35%RC, autoclave cured, 120 minutes at 275°F, normalized to 60%FV

Property	Test method	-100°F (-73°C)	RT	160°F (71°C)
0° Tensile strength, ksi (MPa)	ASTM D-3039	270 (1860)	347 (2390)	318 (2190)
0° Tensile modulus, Msi (GPa)		36.1 (249)	39.6 (273)	-
0° Compressive strength, ksi (MPa)	ASTM D-695 mod	189 (1310)	151 (1040)	165 (1130)
0° Flexural strength, ksi (MPa)	ASTM D-790	208 (1430)	188 (1300)	152 (1040)
0° Flexural modulus, Msi (GPa)		30.5 (211)	30.6 (211)	30.6 (200)
Short beam shear strength, ksi (MPa)	SACMA 8R-94	14.2 (97.9)	10.9 (75.1)	9.54 (65.7)

MR60H CARBON UNITAPE

38%RC, autoclave cured, 130 minutes at 275°F, normalized to 60%FV

Property	Test method	RT
0° Tensile strength, ksi (MPa)		426 (2930)
0° Tensile modulus, Msi (GPa)	ASTM D-3039	23.4 (161)
Poisson's ratio		0.29
0° Compressive strength, ksi (MPa)	ASTM D-695 mod	224 (1540)
0° Compressive modulus, ksi (MPa)		21.2 (146)
0° Flexural strength, ksi (MPa)	ASTM D-790	214 (1470)
0° Flexural modulus, Msi (GPa)		21.5 (148)
Short beam shear strength, ksi (MPa)	ASTM D-2344	12.3 (84.8)

3K 8 HARNESS SATIN CARBON FABRIC

40%RC, autoclave cured, 120 minutes at 275°F, normalized to 60%FV

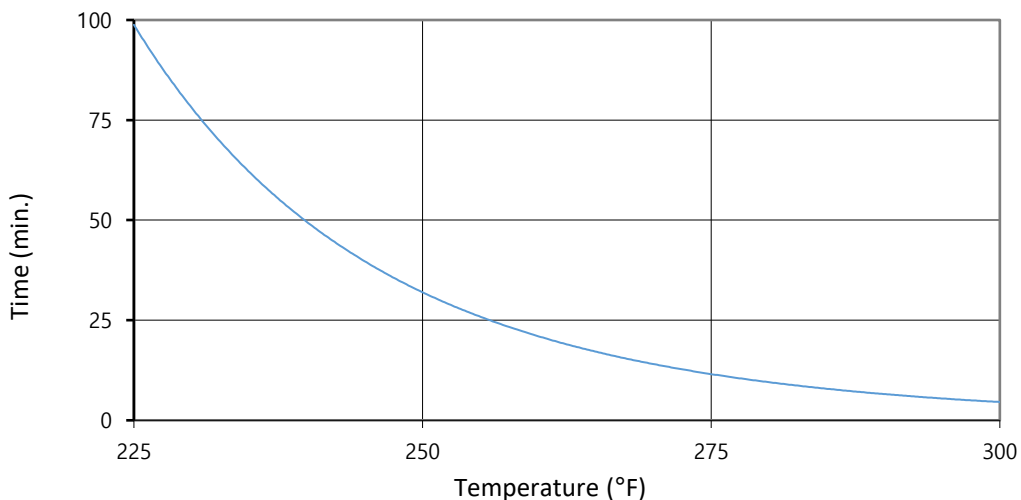
Property	Test method	Room Temp <i>dry</i>	Elevated Temp** <i>dry</i>	Elevated Temp*** <i>wet</i>
0° Tensile strength, ksi (MPa)	ASTM D-3039	111 (765)	113 (779)	121 (834)
0° Tensile modulus, Msi (GPa)		10.1 (70.0)	10.6 (73.1)	10.4 (71.7)
0° Compressive strength, ksi (MPa)	ASTM D-695 mod	114 (786)	91.4 (630)	44.3 (305)
0° Compressive modulus, Msi (GPa)		9.4 (65)	9.4 (65)	9.3 (64)
0° Flexural strength, ksi (MPa)	ASTM D-790	156 (1080)	115 (793)	71.4 (492)
0° Flexural modulus, Msi (GPa)		9.5 (66)	10.1 (70.0)	10.0 (69.0)
Short beam shear strength, ksi (MPa)*	ASTM D-2344	9.9 (68)	6.4 (44)	3.3 (23)
±45° In plane shear strength, ksi (Mpa)* <i>Ultimate</i>	ASTM D-3518	14.6 (100)	12.0 (82.7)	8.4 (58)
±45° In plane shear strength, ksi (Mpa)* <i>5% shear strain</i>		9.2 (63)	5.9 (40)	3.8 (26)
±45° In plane shear strength, ksi (Mpa)* <i>0.2% offset yield</i>		6.2 (43)	4.0 (28)	2.9 (20)
±45° In plane shear modulus, Msi (GPa)*		0.49 (3.4)	0.35 (2.4)	0.29 (2.0)
Open hole compressive strength, ksi (Mpa)*	ASTM D-6484	36.4 (251)	29.3 (202)	24.7 (170)
CAI*	ASTM D-7137	28.5	-	-
Tg by DMA (E'), °C*	ASTM D-7028	138	-	-
Wet Tg by DMA (E'), °C*		101	-	-

*Results as tested

**Elevated Temperature @ 180°F for 10 minutes

***Elevated Temperature @ 180°F for 5 minutes; Water Immersion @ 160°F for 14 days

Gel time vs. temperature



The information contained herein has been obtained under controlled laboratory conditions and are typical or average values and do not constitute a specification, guarantee, or warranty. Results may vary under different processing conditions or in combination with other materials. The data is believed to be reliable but all suggestions or recommendations for use are made without guarantee. You should thoroughly and independently evaluate materials for your planned application and determine suitability under your own processing conditions before commercialization. Furthermore, no suggestions for use or material supplied shall be considered a recommendation or inducement to violate any law or infringe any patent.

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