5300-1

NEWPORT HIGH PERFORMANCE MATERIALS

160-300°F (71-149°C) Epoxy Resin System

Typical applications
Sporting goods
Medical
Marine
Industrial

Out life
45 days at 70°F (21°C)

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

Description
5300-1 is a 160°F (71°C) to 300°F (149°C) cure, toughened, controlled flow epoxy resin system. Versatile processing, excellent mechanical properties, and long out life make 5300-1 suitable for a variety of applications: including large scale structures where layup requirements can take days or weeks, or high through-put press mold at elevated temperature which requires short cycle time.

Benefits/features
- Excellent low temperature cure capability, as low as 160°F (71°C)
- Capable of fast cure at elevated temperature
- Excellent mechanical properties
- Good tack with controlled flow
- Versatile processing

Application
5300-1 can be supplied with most commercially available fibers (carbon, quartz, aramid, S-glass, E-glass, and other specialty fibers) 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 range from 70 – 300 gsm (0.014 – 0.060 psf).

Recommended processing conditions
5300-1 can be cured at temperatures from 160°F (71°C) to 300°F (149°C) depending on part size and complexity. Suitable for vacuum bag, autoclave and press cure with low, medium and high pressures. Large scale structures can be cured as low as 160°F (71°C) with extended cure times. The recommended cure conditions are listed in the table below using a 3°F/min (1.7°C/min) ramp rate. Contact technical service to discuss specific applications.

Cure temperature °F (°C)	Cure time
160 (71)	16 hrs
180 (82)	8 hrs
212 (100)	1 hr

Cure temperature °F (°C)	Cure time
250 (121)	20 – 30 mins
275 (135)	10 - 20 mins
300 (149)	5-10 (max.) mins

Parts requiring a high T_g may need a post cure.

MITSUBISHI CHEMICAL CARBON FIBER AND COMPOSITES

Technical Data Sheet

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

Property	Value
Gel time @ 230°F (110°C), minutes	9-13
Gel time @ 275°F (135°C), minutes	2-4
Specific gravity	1.21
T_g @ (DMA, E'), °C (°F)	145* (293*)

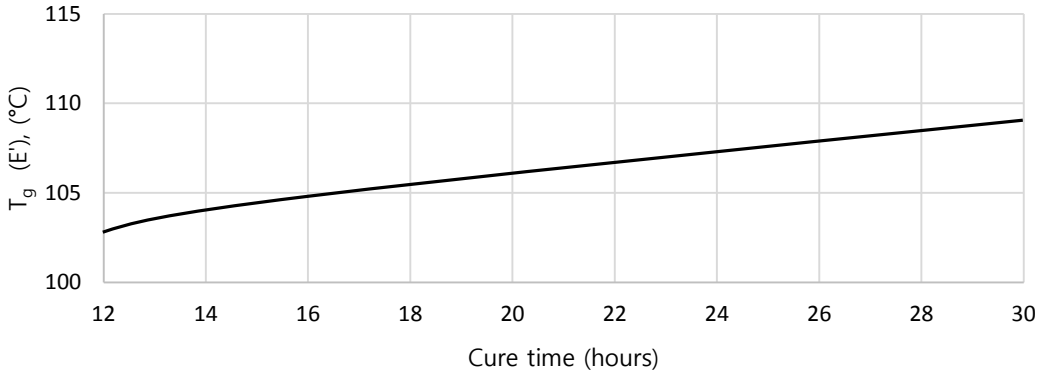
*Cured @ 180°F (82°C) – 4 hours, with a post cure @ 250°F (121°C) – 1 hour

160°F Cure mechanical data [values are average and do not constitute a specification]

34-700 Uni carbon, 300gsm 35%RC, vacuum bag oven cured, 16 hours at 160°F (71°C), normalized to 60%FV

Property	Test method	RT
0° Tensile strength, ksi (MPa)	ASTM D3039	380 (2630)
0° Tensile modulus, Msi (GPa)		19.3 (133)
90° Tensile strength, ksi (MPa)		6.5 (44.8)
90° Tensile modulus, Msi (GPa)		1.21 (8.34)
0° Compression strength, ksi (MPa)	ASTM D695mod	230 (1590)
0° Compression modulus, Msi (GPa)		17.5 (121)
90° Compression strength, ksi (MPa)		25.4 (175)
90° Compression modulus, Msi (GPa)		1.39 (9.58)
0° Flexural strength, ksi (MPa)	ASTM D790	217 (1500)
0° Flexural modulus, Msi (GPa)		18 (124)
90° Flexural strength, ksi (MPa)		15.8 (109)
90° Flexural modulus, Msi (GPa)		1.25 (8.62)
±45° Shear strength @ 5% strain, ksi (MPa)	ASTM D3518	9.1 (62.7)
±45° Shear modulus, Msi (GPa)		0.61 (4.21)
Short beam shear strength, ksi (MPa)	ASTM D2344	12.1 (83.4)

T_g vs cure time @ 160°F (82°C) with no post cure



MITSUBISHI CHEMICAL CARBON FIBER AND COMPOSITES

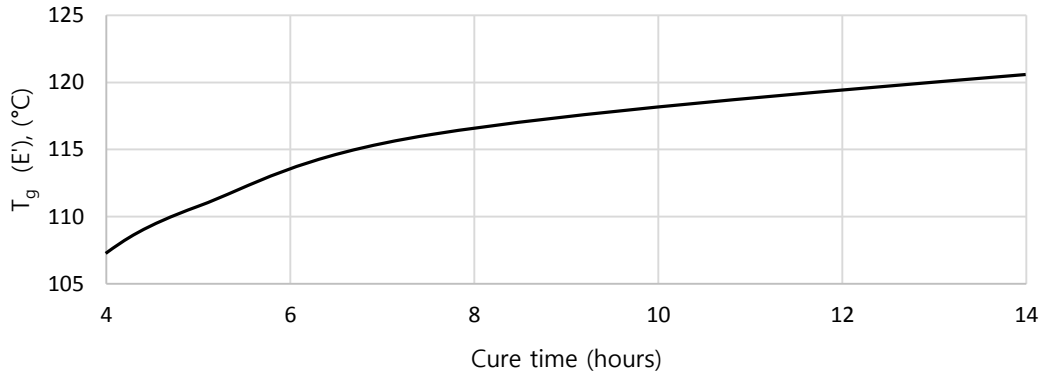
Technical Data Sheet

180°F Cure mechanical data [values are average and do not constitute a specification]

34-700 Uni carbon, 300gsm, 35%RC, vacuum bag oven cured, 8 hours at 180°F (82°C), normalized to 60%FV

Property	Test method	RT
0° Tensile strength, ksi (MPa)	ASTM D3039	391 (2700)
0° Tensile modulus, Msi (GPa)		19.6 (135)
90° Tensile strength, ksi (MPa)		6.9 (48)
90° Tensile modulus, Msi (GPa)		1.19 (8.2)
0° Compression strength, ksi (MPa)	ASTM D695mod	241 (1660)
0° Compression modulus, Msi (GPa)		17.9 (123)
90° Compression strength, ksi (MPa)		29.4 (203)
90° Compression modulus, Msi (GPa)		1.31 (9.03)
0° Flexural strength, ksi (MPa)	ASTM D790	226 (1560)
0° Flexural modulus, Msi (GPa)		18.4 (127)
90° Flexural strength, ksi (MPa)		18.3 (126)
90° Flexural modulus, Msi (GPa)		1.23 (8.48)
±45° Shear strength @ 5% strain, ksi (MPa)	ASTM D3518	9.6 (66)
±45° Shear modulus, Msi (GPa)		0.58 (4)
Short beam shear strength, ksi (MPa)	ASTM D2344	12.3 (85)

T_g vs cure time @ 180°F (82°C) with no post cure



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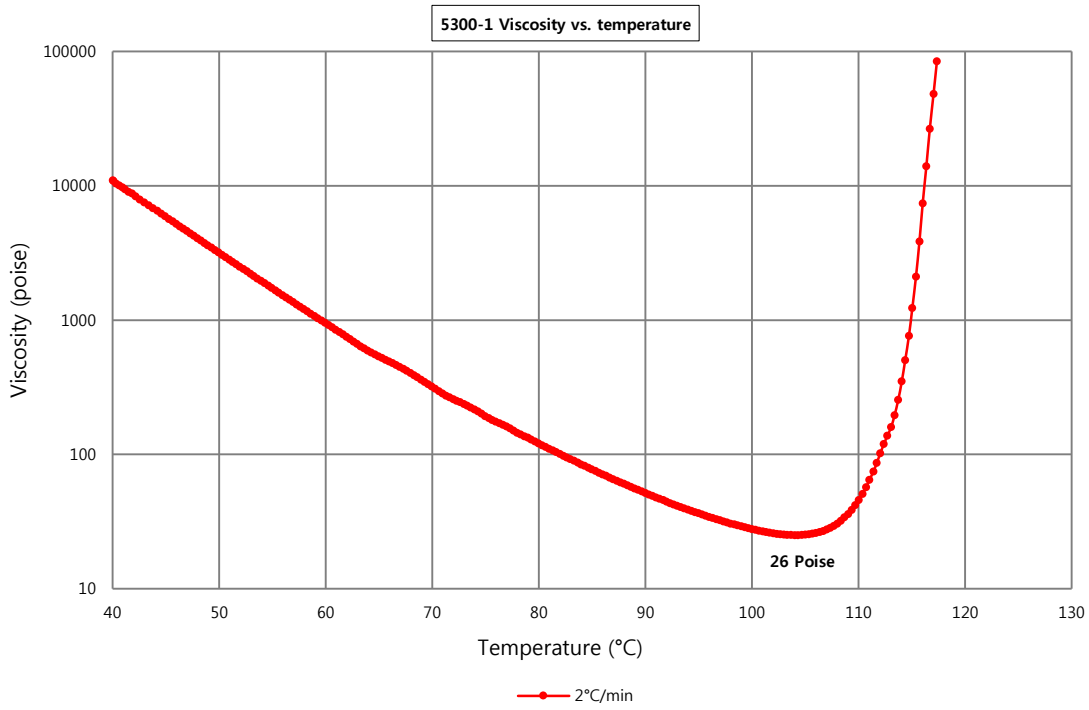
Technical Data Sheet

Viscosity profile

TA - AR2000 parallel plate rheometer



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