

Newport 316

Description:

Newport 316 is a 250°F (121°C) to 300°F (149°C) cure, flame retardant, modified epoxy resin system, designed for use in electrical and electronics applications.

Application:

Newport 316 is suited for use where fire retardant materials are either preferable or mandatory such as electronic and measurement devices as well as electrical enclosures. While the key feature of this material is its conformance to UL 94 V-0 requirements, this system is favored for its versatile processing, excellent mechanical properties and cost efficiency.

Newport 316 can be supplied with most commercially available fibers in both woven form (designated as NB) as well as unidirectional tape (designated as NCT), including:

- Carbon
- Quartz
- Aramid
- S-glass
- E-glass
- Other specialty fibers and fabrics

Woven fabrics are available in standard commercial widths up to 60 inches (1.5 M). Unitape widths up to 39 inches (1M) are available in standard fiber weights ranging from 90 to 300 gsm.

Benefits/Features:

- Meets UL 94 V-0 flammability requirements
- Excellent mechanical properties
- Vacuum bag, press, and autoclave curable
- 30 days out time at 70°F (21°C)
- Available on a wide range of unidirectional fibers and fabrics

Recommended Processing Conditions:

NB 316 can be cured at temperatures from 250°F (121°C) to 300°F (149°C), depending on part size and complexity. Low, medium, and high pressure molding techniques may be used to cure NB 316. Recommended cure cycle is 45 psi, 3°F (1.7°C)/min ramp to 275°F (135°C), hold for 60 minutes, cool to <140°F (60°C).

Physical Properties:

Gel Time 275°F (135°C):	11-14 minutes
Specific Gravity:	1.21
T _g (DMA, E')	115°C (239°F)
CTE (ppm/°C):	50 ± 10 (below T _g)

Mechanical Properties:**34-700 Standard Modulus Unidirectional Carbon Fiber Reinforcement**

The mechanical properties listed in the following table are average values obtained from NB 316 with 34-700 carbon fiber at 35% RC. All values are based using an autoclave cure at 275°F (135°C) for 60 minutes at 45 psi (310kPa). Results are as tested, not normalized.

Property	Test Method	RT*	160 F*	200 F*
0° Tensile strength, ksi	ASTM D-3039	329	303	335
0° Tensile modulus, Msi		19.8	20.2	19.6
Strain, μ in/in		16,000	14,400	13,400
Poisson's ratio		0.31	0.30	0.31
0° Compressive strength, ksi	SACMA 1R-94	171	116	87
0° Compressive modulus, Msi		20.7	18.2	18.5
Strain, μ in/in		9,600	6,400	4,000
0° Flexural strength, ksi	ASTM D-790	263	218	167
0° Flexural modulus, Msi		17.3	18.8	18.0
0° Short Beam Shear strength, ksi	SACMA 8R-94	14.7	9.7	7.6

Property	Test Method	RT*	160 F*	200 F*
90° Tensile strength, ksi	ASTM D-3039	8.6	9.0	6.8
90° Tensile modulus, Msi		1.3	1.2	1.0
Strain, μ in/in		6,500	7,800	6,100
Poisson's ratio		0.016	0.012	0.043
90° Compressive strength, ksi	SACMA 1R-94	32	24	20
90° Compressive modulus, Msi		1.3	1.3	1.1
Strain, μ in/in		22,000	16,000	13,000
90° Flexural strength, ksi	ASTM D-790	12.9	13.9	8.2
90° Flexural modulus, Msi		1.3	1.2	0.7
90° Short Beam Shear strength, ksi	SACMA 8R-94	1.6	1.4	1.3

* Values are average and do not constitute a specification

Wet mechanical data¹

Property	Test Method	RT*	160°F*
0° Tensile strength, ksi	ASTM D-3039	279	328
0° Tensile modulus Msi		21.2	18.6
Strain, μ in/in		13,000	11,100
Poisson's ratio		0.309	0.337
0° Compressive strength ksi	SACMA 1R-94	163	107
0° Compressive modulus, Msi		20.7	19.6
Strain, μ in/in		7,900	5,400
0° Flexural strength, ksi	ASTM D-790	246	197
0° Flexural modulus, Msi		17.5	16.8
0° Short Beam Shear strength, ksi	SACMA 8R-94	13.9	8.6

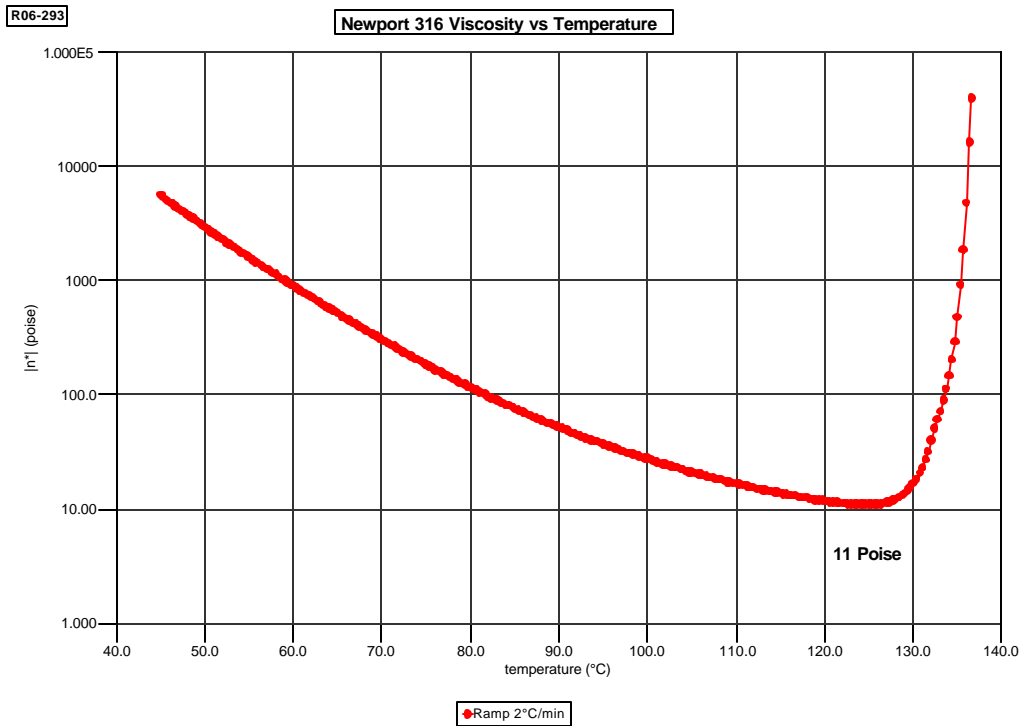
Property	Test Method	RT*	160°F*
90° Tensile strength, ksi	ASTM D-3039	7.8	7.6
90° Tensile modulus, Msi		1.2	0.9
Strain, μ in/in		6,400	7,200
90° Compression strength, ksi	SACMA 1R-94	30.4	22.5
90° Compression modulus, Msi		1.3	1.1
Strain, μ in/in		19,800	15,100
90° Flexural strength, ksi	ASTM D-790	13.2	12.5
90° Flexural modulus, Msi		1.3	1.0
90° Short Beam Shear strength, ksi	SACMA 8R-94	1.6	1.4

*Values are average and do not constitute a specification

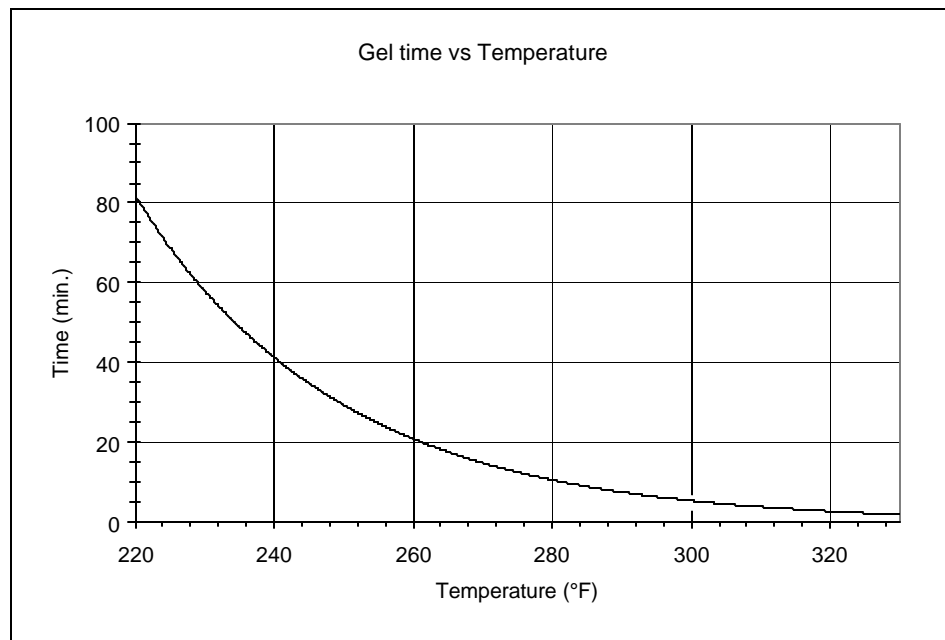
¹ Wet = 14-day water immersion @ 160°F

Melt Viscosity Profile of Newport 316

A TA (model AR2000) parallel plate rheometer was used to determine the melt viscosity profile of the neat resin system.



Gel Curve Profile of Newport 316



Prepreg Storage:

Material can be stored at 40°F (4°C) for 3 months, or 0°F (-18°C) for 6 months. Out time is 30 days at room temperature 70°F (21°C).

Availability:

Newport 316 is available on a wide variety of woven fabrics and unidirectional tapes including aramid, E-glass, S-glass, carbon, and other fibers. Some product characteristics such as areal weight, resin content, gel time can be tailored within reason to meet specific requirements. Contact Newport about any specialty fibers or requirements.

Standard prepreg fabric widths:

E-glass 38, 50 inches

Carbon 42, 50 inches

Kevlar® 38, 50 inches

Standard unidirectional tape widths: 12, 24, 36 inches; 0.5, 1 meter

For orders, pricing, availability, technical assistance or other inquiries please contact:

CORPORATE OFFICES

Newport Adhesives and Composites

1822 Reynolds Ave,

Irvine, CA 92614

Tel: (949) 253-5680

Fax: (949) 253-5692

Sales@newportad.com

http://www.newportad.com

(Kevlar® is a trademark of the DuPont Company)

Disclaimer: 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 suggestion for use or material supplied shall be considered a recommendation or inducement to violate any law or infringe any patent.

