
Newport 321

Description:

Newport 321 is a 250°F (121°C) to 300°F (149°C) cure, toughened, high Tg, controlled flow epoxy resin system. Versatile processing, excellent mechanical properties, and long out time make Newport 321 especially suited for general aviation, aerospace, and industrial markets. FAA approved design allowable database is available.

Application:

The high Tg, and excellent mechanical properties make Newport 321 an ideal product for the UAV, general aviation, aerospace and industrial markets, where products are required to operate under demanding temperatures.

Newport 321 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. Newport 321 LS lightning strike on metal mesh reinforcement provides suitable lightning strike protection.

Benefits/Features:

- High dry and wet Tg
- Excellent mechanical properties
- B-Basis design allowable database
- Vacuum bag 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:

Newport 321 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 Newport 321. Recommended cure cycle is 50 psi (345 kPa), 3°F /min ramp to 275°F (135°C), hold for 90-120 minutes, cool to <140°F (60°C).

Physical Properties:

Gel Time 275°F (135°C):	5 - 7 minutes
Specific Gravity:	1.22
Tg (DMA, E'):	150°C (302°F)

Mechanical Properties (AGATE):
7781 E-Glass Reinforcement

The mechanical properties listed in the following table are average values obtained from NB 321 with style 7781 woven fiberglass. All values are based using a vacuum bag oven cure, 1.5°F (0.8°C)/min, 270°F (132°C) hold for 2 hours. Results are normalized to 0.0098" (0.0249cm) CPT.

Property	Test Method	-65°F*	RT*	175°F wet* ¹
0° Tensile strength, ksi	ASTM D-3039	65	62	42
0° Tensile modulus, Msi		4.0	4.1	3.4
Poisson's ratio		0.16	0.14	--
0° Compressive strength, ksi	SACMA 1R-94	97	78	56
0° Compressive modulus, Msi		3.9	3.9	3.8
In-Plane Shear strength, ksi	ASTM D-5379	23	19	13
In-Plane Shear modulus, Msi		0.7	0.6	0.4
0° Short Beam Shear strength, ksi	SACMA 8R-94	--	9.4	--

* Values are average and do not constitute a specification

¹ 175°F, 85%RH until equilibrium

Standard Modulus Unidirectional Carbon Fiber Reinforcement

The mechanical properties listed in the following table are average values obtained from NB 321 with standard modulus carbon fiber at 40% RC. All values are based using a vacuum bag oven cure, 1.5°F (0.8°C)/min, 270°F (132°C) hold for 2 hours. Results are normalized to 0.006" (0.015 cm) CPT.

Property	Test Method	-65°F*	RT*	175°F wet* ¹
0° Tensile strength, ksi	ASTM D-3039	291	296	269
0° Tensile modulus, Msi		19.0	18.6	18.6
Poisson's ratio		--	0.3	--
90° Tensile strength, ksi		7.3	7.1	4.7
90° Tensile modulus, Msi		1.3	1.2	0.9
0° Compressive strength, ksi	SACMA 1R-94	196	172	124
0° Compressive modulus, Msi		17.0	17.9	17.7
90° Compressive strength, ksi		40	32	24
90° Compressive modulus, Msi		1.6	1.6	1.1
In-Plane Shear strength, ksi	ASTM D-5379	25	21	14
In-Plane Shear modulus, Msi		0.7	0.6	0.5
0° Short Beam Shear strength, ksi	SACMA 8R-94	--	13.1	--

* Values are average and do not constitute a specification

¹ 175°F, 85%RH until equilibrium

3K Plain Weave Carbon Fabric Reinforcement

The mechanical properties listed in the following table are average values obtained from NB 321 with 3K PW carbon fabric. All values are based using a vacuum bag oven cure, 1.5°F (0.8°C)/min, 270°F (132°C) hold for 2 hours. Results are normalized to 0.0085" (0.22 cm) CPT.

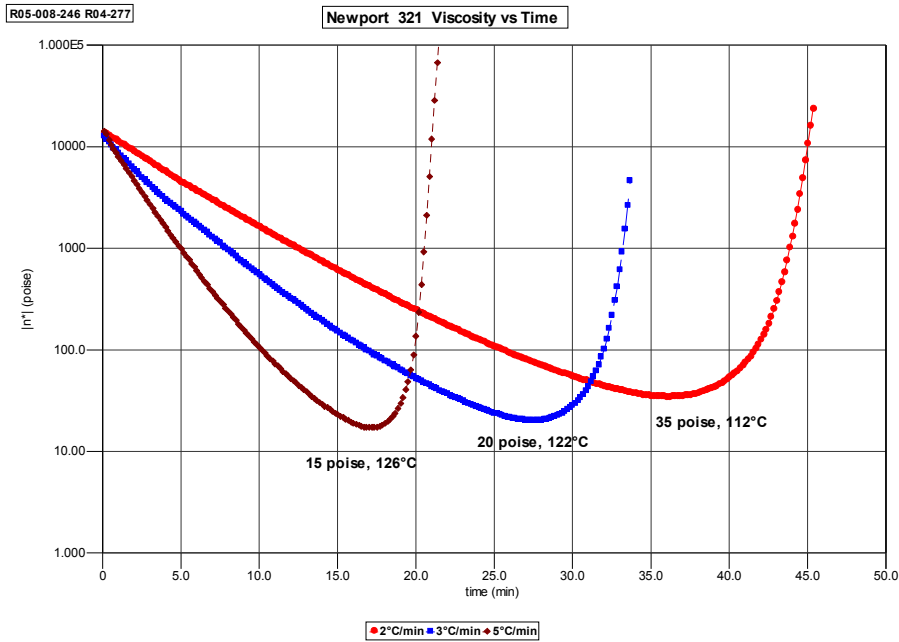
Property	Test Method	-65°*	RT*	175°F wet* ¹
0° Tensile strength, ksi	ASTM D-3039	81	87	74
0° Tensile modulus, Msi		7.9	9.3	8.2
Poisson's ratio			0.06	
0° Compressive strength, ksi	SACMA 1R-94	79	71	57
0° Compressive modulus, Msi		7.8	8.2	8.4
In-Plane Shear strength, ksi	ASTM D-5379	18	17	11
In-Plane Shear modulus, Msi		0.7	0.6	0.4
0° Short Beam Shear strength, ksi	SACMA 8R-94	--	8.8	--

*Values are average and do not constitute a specification

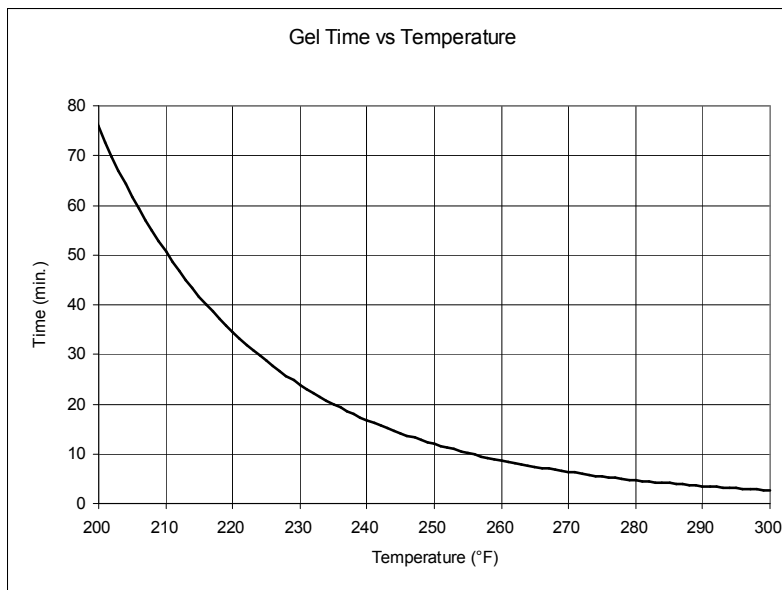
¹ 175°F, 85%RH until equilibrium

Viscosity Profile of Newport 321

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



Gel Curve of Newport 321



 **MITSUBISHI RAYON CARBON FIBER AND COMPOSITES, INC.**

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 maximum at room temperature 70°F (21°C).

Availability:

NB 321 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 or resin content 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:

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(Kevlar[®] is a trademark of the DuPont Company)

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