Newport 321

Description:

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

Application:

The high Tg, and excellent mechanical properties make NB 321 an ideal product for the UAV, general aviation, aerospace and industrial markets, where products are required to operate in a large environmental envelope.

NB-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. Unitape widths up to 39 inches (1M) are available in standard fiber weights ranging from 90 to 300 gsm.

Benefits/Features:

- High dry and wet Tg
- Excellent mechanical properties
- B-Basis design allowable database
- Vacuum bag and autoclave cureable
- 30 days out-life 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 to 300°F, depending on service temperature requirements. Low, medium, and high pressure molding techniques may be used to cure Newport 321.
Recommended cure cycle is 50psi, 3°F/min ramp to 275°F, hold for 90-120 minutes, cool to <140°F.

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Physical Properties:

Gel Time (275°F):	5-7 minutes
Specific Gravity:	1.22 ± 0.02
Tg (DMA, E'):	300°F

Mechanical Properties (AGATE):

7781 E-Glass reinforcement

The mechanical property data supplied 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/min, 270°F hold for 2 hours. Data normalized to 0.0098"CPT.

	Test Method	-65°F*	RT*	175°Fwet*+
Tensile strength, ksi	ASTM D-3039	65	62	42
Tensile modulus, Msi		4.0	4.0	3.4
Poisson's ratio		0.16	0.14	--
Compression strength, ksi	SACMA SRM 1R-94	97	78	56
Compression 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
Short Beam Shear strength, ksi	ASTMD-2344	--	9.4	--

** Values are average and do not constitute a specification*

+ 145°F, 85%RH until equilibrium

Standard Modulus Uni-directional Carbon Fiber tape reinforcement

The mechanical property data supplied in the following table are average values obtained from NCT-321 with standard modulus carbon fiber at 40% RC. All values are based using a vacuum bag oven cure, 1.5°F/min, 270°F hold for 2 hours. Data normalized to 0.006" CPT

NCT-321	Test Method	-65°F*	RT*	175°Fwet*+
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° Compression strength, ksi	SACMA SRM 1R-94	196	172	124
0° Compression modulus, Msi		17.0	17.9	17.7
90° Compression strength, ksi		40	32	24
90° Compression modulus, Msi		1.6	1.6	1.1
In-Plane Shear strength, +/-45°, ksi	ASTM D-5379	25	21	14
In-Plane Shear modulus, +/-45°, Msi		0.7	0.6	0.5
0° Short Beam Shear str., ksi	ASTM D-2344	--	13.1	--

** Values are average and do not constitute a specification*

+ 145°F, 85%RH until equilibrium

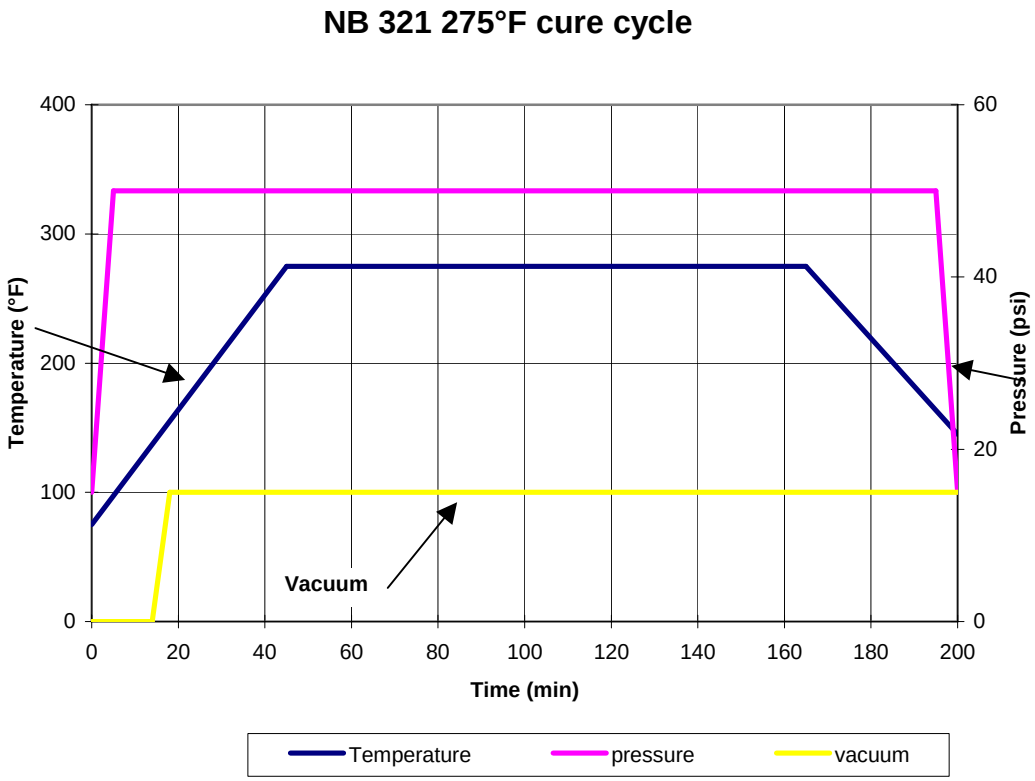
3K Plain Weave Carbon reinforcement

The mechanical property data supplied in the following table are average values obtained from NB 321 with 3k plain weave carbon fabric. All values are based using a vacuum bag oven cure, 1.5°F/min, 270°F hold for 2 hours. Data normalized to 0.0085" CPT.

Newport 321 3k Plain Weave	Test Method	-65°F*	RT*	175°Fwet*+
Tensile strength, ksi	ASTM D-3039	81	87	74
Tensile modulus, Msi		7.9	9.3	8.2
Poisson's ratio			0.06	
Compression strength, ksi	SACMA SRM 1R-94	79	71	57
Compression 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
Short Beam Shear strength, ksi	ASTMD-2344	--	8.8	--

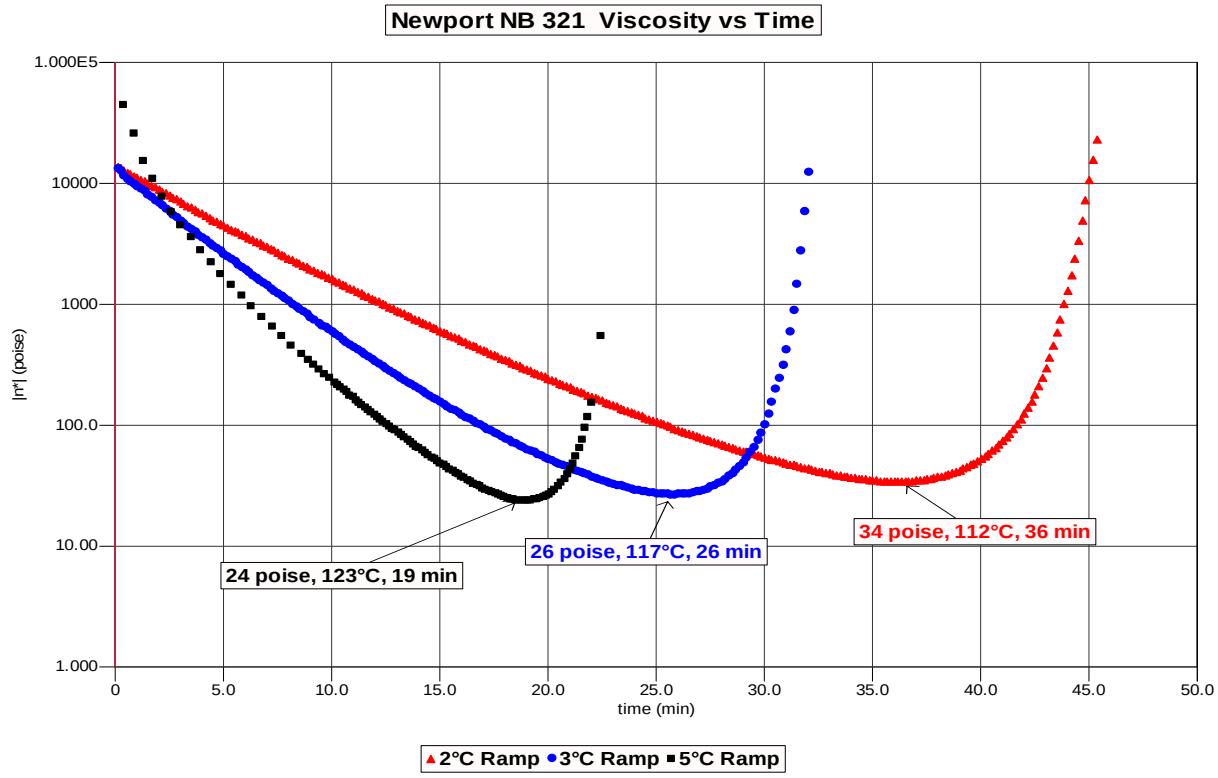
**Values are average and do not constitute a specification*
+ 145°F, 85%RH until equilibrium

Newport 321 Autoclave Cure Cycle

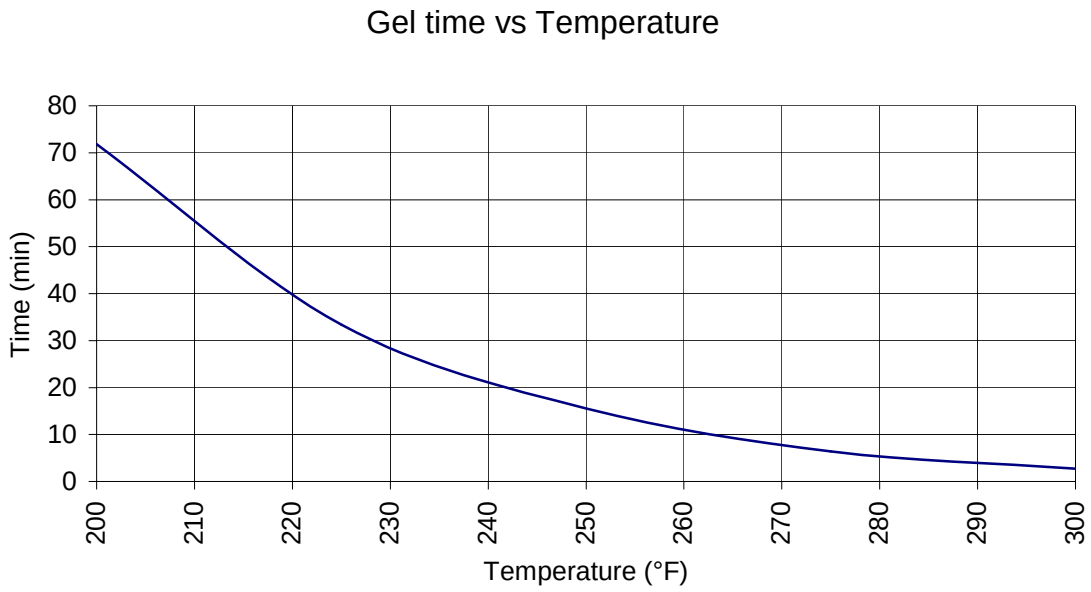


Melt Viscosity Profile of Newport 321

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 321



Prepreg Storage:

Material can be stored at 40°F for 3 months, or 0°F for 6 months.

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. Tack, flow and other properties can be tailored to meet your specific requirements. Contact Newport about any specialty fibers or requirements.

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

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