
Newport 301

Description:

Newport 301 is a 250°F to 300°F (121°C - 149°C) cure, toughened, controlled flow epoxy resin system. Versatile processing, excellent mechanical properties, and long out time make Newport 301 suitable for a variety of applications, including large scale structures where layup requirements can take days or weeks.

Application:

Newport 301 is well suited for structural applications in sporting goods, marine, medical, and industrial manufacturing.

Newport 301 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 70 to 300 gsm.

Benefits/Features:

- Excellent mechanical properties
- Moderate tack
- Good toughness
- Controlled flow
- >30 days out time at 70°F (21°C)
- Available on a wide range of unidirectional fibers and fabrics

Recommended Processing Conditions:

Newport 301 can be cured at temperatures from 250°F to 300°F (121°C - 149°C) depending on part size and complexity. Large scale structures can be cured as low as 195°F-220°F (90.5°C-104°C) (with extended cure times). Low, medium and high pressure molding techniques may be used to cure 301 products. Recommended cure cycle is 50 psi (345 kPa); 3°F (1.7°C)/min ramp to 275°F (135°C); hold for 60 minutes, cool to <140°F (60°C).


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Physical Properties:

Gel Time 275°F (135°C):	3 - 5 minutes
Specific Gravity:	1.22
Tg (DMA, E'):	120°C (248°F)
CTE (ppm/°C)	60 ± 10 (below Tg)

Mechanical Properties:**Neat resin properties*:**

Tensile strength, ksi	8.3
Tensile modulus, Msi	0.46
Flexural strength, ksi	14.6
Flexural modulus, Msi	0.50

* Values are average and do not constitute a specification

7781 E-Glass Reinforcement

The mechanical properties listed in the following table are average values obtained from NB 301 with style 7781 woven fiberglass. All values are based using an "in-hot out-hot" press cure at 275° F (135°C) for 45 minutes and 25 psi (172 kPa). Results are as tested, not normalized.

Property	Test Method	RT*	160°F*
0° Tensile strength, ksi	ASTM D-638 Type I	54	45
0° Tensile modulus, Msi		3.5	3.6
0° Compressive strength, ksi	SACMA 1R-94	61	51
0° Compressive modulus, Msi		3.6	3.7
0° Flexural strength, ksi	ASTM D-790	68	54
0° Flexural modulus, Msi		3.5	3.3
0° Short Beam Shear strength, ksi	SACMA 8R-94	9.8	7.5

* Values are average and do not constitute a specification

Standard Modulus Unidirectional Carbon Fiber Reinforcement

The mechanical properties listed in the following table are average values obtained from NCT 301 with 34-700 carbon fiber at 35% RC. All values are based using a press cure at 275°F (135°C) for 60 minutes and 25 psi (172 kPa) pressure. Results are normalized to 60% fiber volume, except for 0° SBS strength and all 90° properties.

Property	Test Method	RT*
0° Tensile strength, ksi	ASTM D- 3039	295
0° Tensile modulus, Msi		19
Strain, μ in/in		14,700
Poisson's ratio		0.304
0° Compressive strength, ksi	SACMA 1R-94	180
0° Compressive modulus, Msi		18.6
0° Flexural strength, ksi	ASTM D-790	280
0° Flexural modulus, Msi		18.2
0° Short Beam Shear strength, ksi	SACMA 8R-94	13.2

Property	Test Method	RT*
90° Tensile strength, ksi	ASTM D- 3039	8.7
90° Tensile modulus, Msi		1.3
Strain, μ in/in		6,100
Poisson's ratio		0.017
90° Compressive strength, ksi	SACMA 1R-94	28.8
90° Compressive modulus, Msi		1.2
90° Flexural strength, ksi	ASTM D-790	16.7
90° Flexural modulus, Msi		1.2
90° Short Beam Shear strength, ksi	SACMA 8R-94	1.3

* Values are average and do not constitute a specification

3K Plain Weave Carbon Fabric Reinforcement

The mechanical properties listed in the following table are average values obtained from NB 301 with 3K PW carbon fabric, press cured at 250°F (121°C) for 60 minutes with 25 psi (172 kPa) pressure. Results are normalized to 55% fiber volume, except for 0° SBS strength.

Property	Test Method	RT*
0° Tensile strength, ksi	ASTM D-638 Type I	81
0° Tensile modulus, Msi		9.1
0° Compressive strength, ksi	SACMA 1R-94	78
0° Compressive modulus, Msi		7.9
0° Flexural strength, ksi	ASTM D-790	129
0° Flexural modulus, Msi		7.7
0° Short Beam Shear strength, ksi	SACMA 8R-94	9.2

* Values are average and do not constitute a specification

Typical NCT 301 Carbon Unitape Mechanical Property Values

(Results are as tested, not normalized unless otherwise marked).

NCT301 (TR50S fiber)	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	360
0° Tensile modulus, Msi		20.4
0° Compressive strength, ksi	SACMA 1R-94	215
0° Compressive modulus, Msi		17.2
0° Flexural strength, ksi	ASTM D-790	234
0° Flexural modulus, Msi		18.2
90° Flexural strength, ksi	ASTM D-790	16.0
90° Flexural modulus, msi		1.2
0° Short Beam Shear strength, ksi	SACMA 8R-94	14.0

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

NCT301 (AS4 fiber)	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	300
0° Tensile modulus, Msi		18.5
0° Compressive strength, ksi	SACMA 1R-94	200
0° Compressive modulus, Msi		17.9
0° Flexural strength, ksi	ASTM D-790	230
0° Flexural modulus, Msi		18.6
0° Short Beam Shear strength, ksi	SACMA 8R-94	13.7

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

NCT301 (T700 fiber)	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	360
0° Tensile modulus, Msi		18.9
0° Compressive strength, ksi	SACMA 1R-94	186
0° Compressive modulus, Msi		18.1
0° Flexural strength, ksi	ASTM D-790	240
0° Flexural modulus, Msi		18.5
0° Short Beam Shear strength, ksi	SACMA 8R-94	14.1

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

NCT301 (TRH50 fiber)	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	344
0° Tensile modulus, Msi		21.8
0° Compressive strength, ksi	SACMA 1R-94	210
0° Compressive modulus, Msi		-
0° Flexural strength, ksi	ASTM D-790	235
0° Flexural modulus, Msi		20.0
0° Short Beam Shear strength, ksi	SACMA 8R-94	11.0

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


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NCT301 (MR60H fiber)**	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	440
0° Tensile modulus, Msi		24.5
0° Compressive strength, ksi	ASTM D-695	233
0° Compressive modulus, Msi		21.4
0° Flexural strength, ksi	ASTM D-790	250
0° Flexural modulus, Msi		22.1
90° Flexural strength, ksi	ASTM D-790	18.4
0° Short Beam Shear strength, ksi	SACMA 8R-94	13.4

**Normalized to fiber volume 60%

*Values are average and do not constitute a specification

NCT301 (MR40 fiber)	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	285
0° Tensile modulus, Msi		23.2
0° Compressive strength, ksi	SACMA 1R-94	183
0° Compressive modulus, Msi		20.6
0° Flexural strength, ksi	ASTM D-790	220
0° Flexural modulus, Msi		20.9
0° Short Beam Shear strength, ksi	SACMA 8R-94	13.4

* Values are average and do not constitute a specification

NCT301 (HR40 fiber)	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	340
0° Tensile modulus, Msi		31.4
0° Compressive strength, ksi	SACMA 1R-94	175
0° Compressive modulus, Msi		28.9
0° Flexural strength, ksi	ASTM D-790	224
0° Flexural modulus, Msi		28.4
0° Short Beam Shear strength, ksi	SACMA 8R-94	13.8

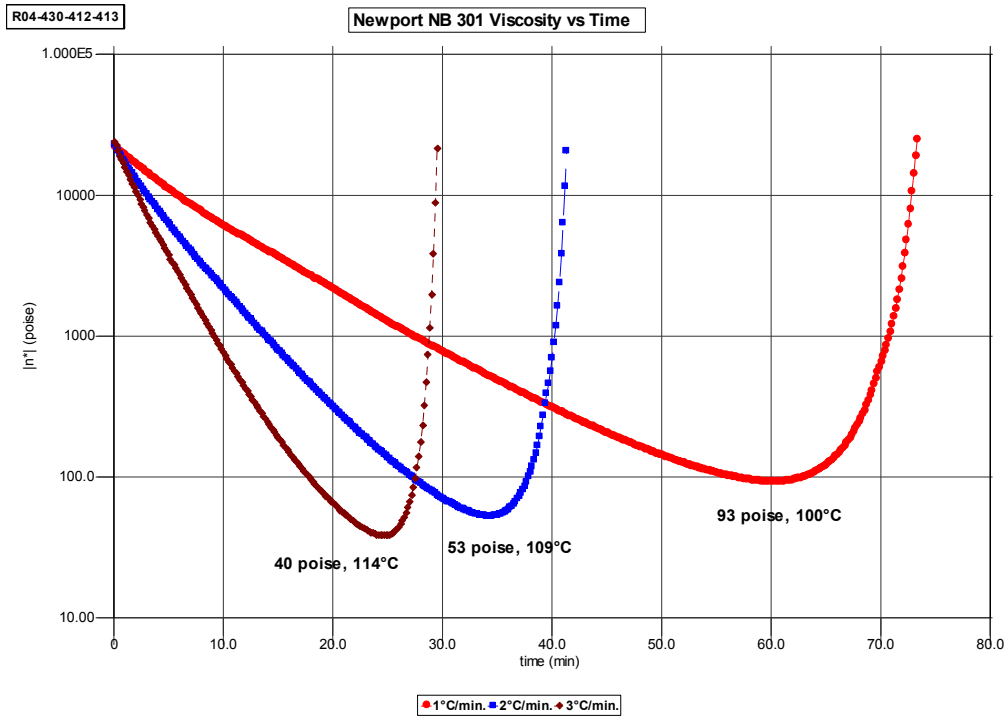
* Values are average and do not constitute a specification

NCT301 (HS40 fiber)	Test Method	RT*
0° Tensile strength, ksi	ASTM D-3039	322
0° Tensile modulus, Msi		35.2
0° Compressive strength, ksi	SACMA 1R-94	148
0° Compressive modulus, Msi		31.6
0° Flexural strength, ksi	ASTM D-790	179
0° Flexural modulus, Msi		30.5
0° Short Beam Shear strength, ksi	SACMA 8R-94	14.2

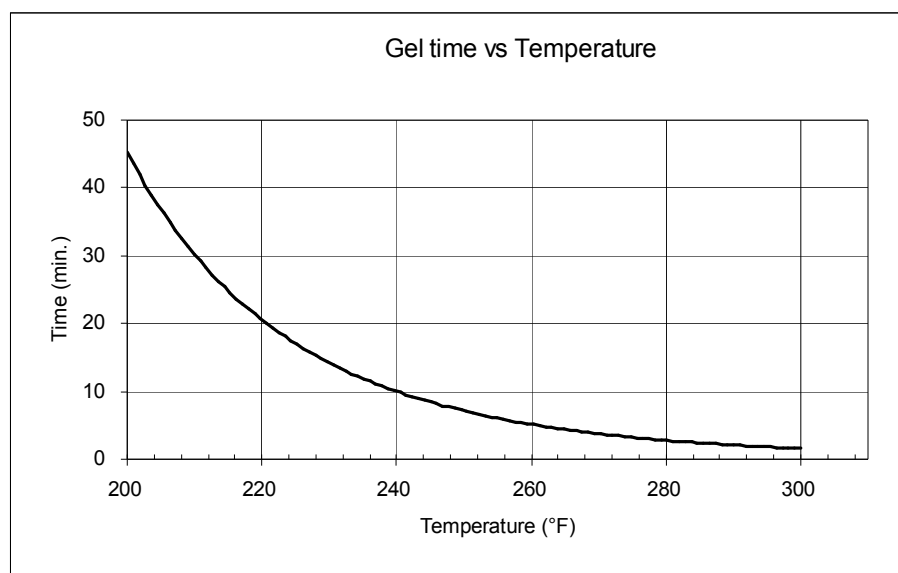
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Viscosity Profile of Newport 301

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 301



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

Prepreg Storage:

Material can be stored at 40°F (4°C) for 6 months, or 0°F (-18°C) for 12 months. Out time is more than 30 days at room temperature 70°F (21°C).

Availability:

Newport 301 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:

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