# 1101

NEWPORT HIGH PERFORMANCE MATERIALS

MITSUBISHI CHEMICAL CARBON FIBER AND COMPOSITES

Technical Data Sheet

## 250-300°F (121-149°C) Cure Epoxy Film Adhesive

### Typical applications

Aerospace
Sporting goods
Marine
Wind energy
Industrial manufacturing

### Out life

7 days at 70°F (21°C)

### Shelf life

3 months at 40°F (4°C)
6 months at 0°F (-18°C)

### Description

1101 and 1101-331 are 250°F (121°C) to 300°F (149°C) cure, modified epoxy prepregs designed for one-step assembly of fiberglass and aramid faced sandwich panels for applications requiring high strength at temperatures from -67°F (-55°C) to 200°F (93°C).

### Benefits/features

Self-adhesive prepreg
High sandwich panel bond strength
Co-curable with most 250°F (121°C) curing prepregs
Meets NASA outgassing requirements
Co-curable adhesives available (101, 102, 106)
7 days out time at 70°F (21°C)

### Variants

- 1101-331 - increased tack

### Application

1101 is suited for structural and secondary applications in aerospace, sporting goods, radomes, marine, wind energy, and industrial manufacturing where good adhesion strength and toughness is required.

1101 can be supplied with most commercially available fibers in woven form (designated as NB) 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).

### Recommended processing conditions

1101 and 1101-331 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 1101 and 1101-331. Recommended cure cycle is 25 psi (172 kPa), 3°F (1.7°C)/min. ramp to 275°F (135°C), hold for 60 minutes, cool to <140°F (60°C).

## Neat resin (values are average and do not constitute a specification)

| Property | Measured Value |
|---|---|
| Gel time @ 275°F (135°C), minutes | 3 - 6 |
| Gel time @ 250°F (121°C), minutes | 7 - 10 |
| Specific gravity | 1.20 |
| $T_g$ (DMA, E'), °C (°F) | 110 (230) |

## Mechanical data (values are average and do not constitute a specification)

7781 E-glass reinforcement, 40%RC, press cured, 25 psi, 275°F, 60 min., as tested

| Property | Test method | -67°F | RT | 160°F |
|---|---|---|---|---|
| 0° Tensile strength, ksi (MPa) | ASTM D3039 | -- | 65 (448) | 48 (331) |
| 0° Tensile modulus, Msi (GPa) | | -- | 3.5 (24.1) | 3.3 (22.7) |
| 0° Compression strength, ksi (MPa) | SACMA 1R-94 | -- | 63 (434) | 40 (276) |
| 0° Compression modulus, Msi (GPa) | | -- | 3.4 (23.4) | 3.0 (20.7) |
| 0° Flexural strength, ksi (MPa) | ASTM D790 | -- | 87 (600) | 42 (290) |
| 0° Flexural modulus, Msi (GPa) | | -- | 3.2 (22.1) | 3.0 (20.7) |
| 0° Short beam shear strength, ksi) | SACMA 8R-94 | -- | 7.5 (51.7) | -- |
| Climbing drum peel strength, in-lb/in (Nm) | ASTM D1781 | 20 (2.26) | 35 (3.95) | 28 (3.16) |
| Flatwise tensile strength, psi (MPa) | ASTM C297 | 790 (5.45) | 900 (6.21) | 800 (5.52) |

3K PW 40%RC, autoclave cured, 25 psi, 250°F for 60 min., as tested, obtained per MIL-A-25463

| Property | Test method | RT | 160°F |
|---|---|---|---|
| 0° Tensile strength, ksi (MPa) | ASTM D3039 | 108 (745) | 100 (689) |
| 0° Tensile modulus, Msi (GPa) | | 7.8 (53.8) | 7.4 (51.0) |
| 0° Compression strength, ksi (MPa) | SACMA 1R-94 | 68 (469) | -- |
| 0° Compression modulus, Msi (GPa) | | 7.3 (50.3) | -- |
| 0° Flexural strength, ksi (MPa) | ASTM D790 | 99 (682) | 7.2 (49.6) |
| 0° Flexural modulus, Msi (GPa) | | 7.6 (52.4) | 7.1 (49.0) |
| 0° SBS strength, ksi (MPa) | SACMA 8R-94 | 8.2 (56.5) | -- |

285 Aramid fabric 55%RC, autoclave cured, 45 psi, 275°F for 90 min., as tested

| Property | Test method | RT | 160 °F |
|---|---|---|---|
| 0° Tensile strength, ksi (MPa) | ASTM D3039 | 65 (448) | 48 (331) |
| 0° Tensile modulus, Msi (GPa) | | 4.2 (29.0) | 3.4 (23.4) |
| 0° Compression strength, ksi (MPa) | SACMA 1R-94 | 24 (165) | 19 (131) |
| 0° Compression modulus, Msi (GPa) | | 3.6 (24.8) | 3.0 (20.7) |
| 0° Flexural strength, ksi (MPa) | ASTM D790 | 53 (365) | 42 (290) |
| 0° Flexural modulus, Msi (GPa) | | 3.4 (23.4) | 3.6 (24.8) |
| 0° SBS strength, ksi (MPa) | SACMA 8R-94 | 6.4 (44.1) | -- |

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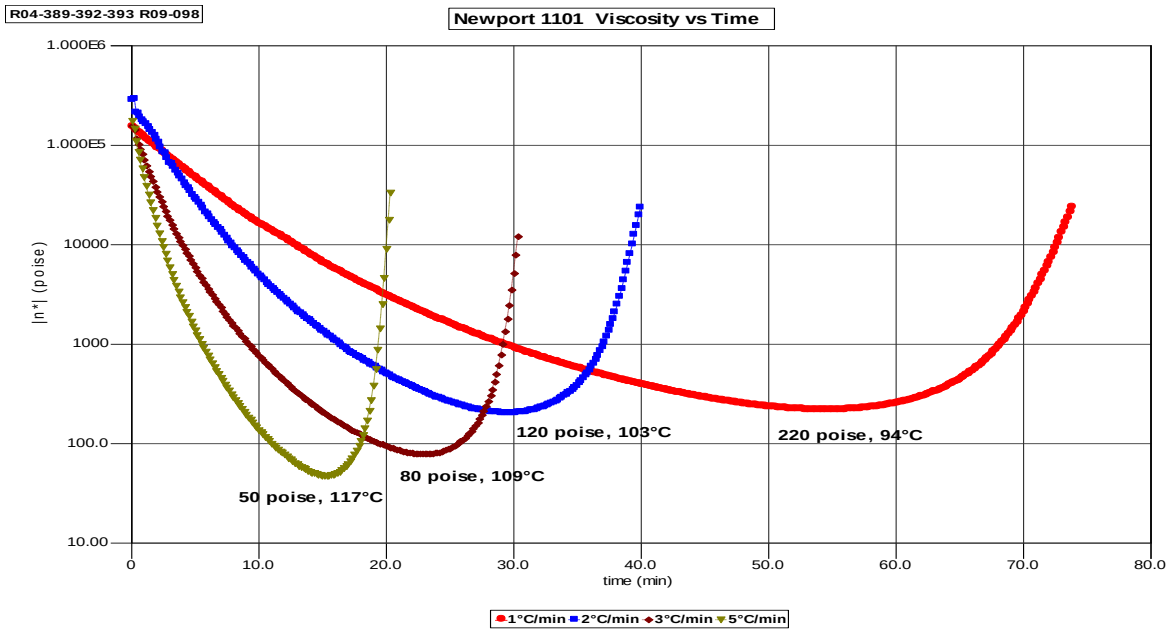
7725 E-glass reinforcement 45%, autoclave cured, 30 psi, 275°F for 60 min., as tested

| Property | Test method | Control panel | Weathered panel |
|---|---|---|---|
| 0° Tensile strength, ksi (MPa) | ASTM D3039 | 41 (283) | 43 (296) |
| 0° Tensile modulus, Msi (GPa) | | 2.4 (16.5) | 2.6 (17.9) |
| 0° Compression strength, ksi (MPa) | SACMA 1R-94 | 60 (414) | 59 (407) |
| 0° Compression modulus, Msi (GPa) | | 2.8 (19.3) | 2.9 (20.0) |
| 0° Flexural strength, ksi (MPa) | ASTM D790 | 64 (441) | 67 (462) |
| 0° Flexural modulus, Msi (GPa) | | 2.7 (18.6) | 2.8 (19.3) |
| 0° SBS strength, ksi (MPa) | SACMA 8R-94 | 6.2 (42.7) | 6.2 (42.7) |

# Viscosity profile

TA - AR2000 parallel plate rheometer

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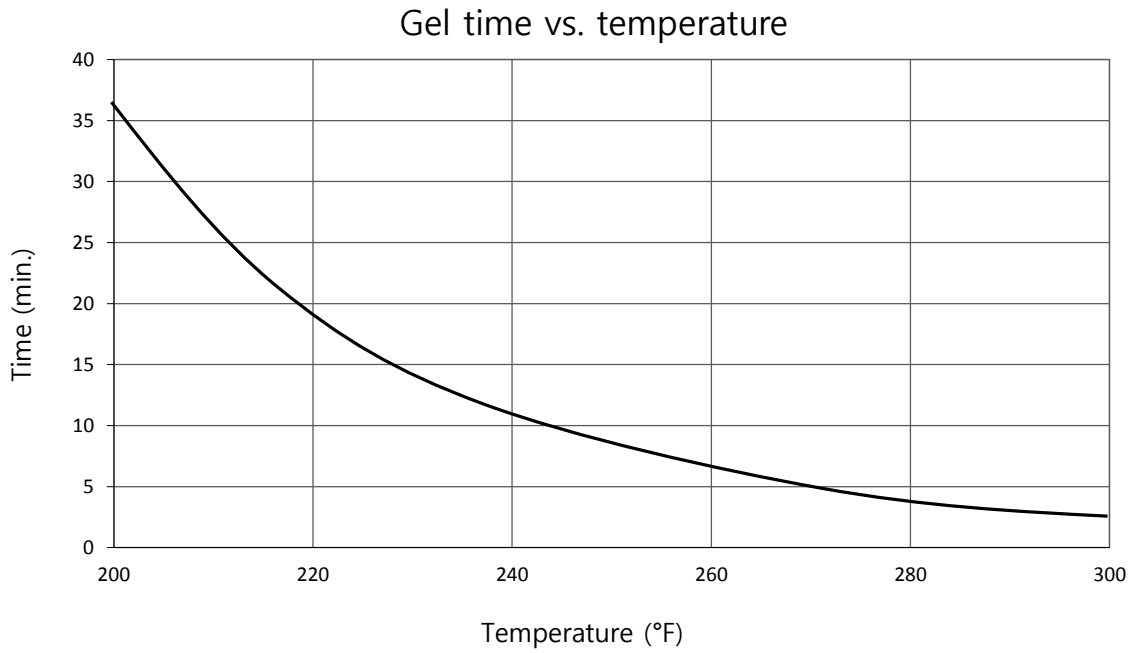
## Gel curve

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