

Arovex[®] SC Prepreg System

Zyvex Nano-Engineered Composite

Technical Datasheet

Oct 2014

Description

Arovex[®] SC prepreg is an 82°C (180°F) to 177°C (350°F) curing carbon nanotube strengthened epoxy prepreg suitable for numerous composites applications. Normal curing takes place at 121°C (250°F) under pressure for one hour with a resulting glass transition temperature in the 130°C range.

Arovex[®] SC can also be “snap-cured” at 177°C under pressure for 5 minutes.

Arovex[®] SC resin contains an optimum level of carbon nanotubes for additional toughness and enhanced mechanical properties. The carbon nanotubes use molecular dispersion technology to ensure enhancements are evenly distributed throughout the resin.

Prepreg Sizing

Prepreg is available in widths up to 127 centimeters (50 inches) for standard woven fabrics. Unitape widths are available up to 61 cm (24 in) in 100 gsm to 300 gsm Fiber Areal Weights (FAW).

Prepreg Processing

The prepreg processes as easily as conventional prepreps and has a long out-life for easier handling and processing. It has excellent retention of tack and drape with 30 day out-life at 22°C (one year at -18°C).

Features

- Very high toughness
- High strength
- High stiffness
- Enhanced mechanical properties
- Excellent retention of tack and drape

Table 1 | Manufacturing

Manufacturing Processes	Fiber Applications
Vacuum bagged, oven cured	Carbon
Autoclaved	E-Glass
Hot Press	S-Glass
-	Aramid

-	Other fabrics on request
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Mechanical Properties

Table 2 | Mechanical Characteristics – Arovex Resin with Grafil TR30 3K 2 X2 Twill 200 FAW

Test ¹	Test Method	Warp Value
Flexural Strength	ASTM D 790	154 (ksi) 1067 (Mpa)
Flexural Modulus	ASTM D 790	8.5 (Msi) 59 (Gpa)
Compressive Strength	ASTM D 3410	103 (ksi) 714 (Mpa)
Tensile Strength	ASTM D 3039	142 (ksi) 984 (Mpa)
Tensile Modulus	ASTM D 3039	11.2 (Msi) 78 (Gpa)
Short Beam Shear Strength	ASTM D 2344	11.0 (ksi) 76 (Mpa)
Izod Impact	ASTM D 256-06	12 (ft-lb/in) 643 (J/m)
Glass Transition Temperature	ASTM D 7028-07 Storage Modulus Onset	270 (°F) 132 (°C)
G _{IC} Strain Energy Release	ASTM D 5528-07	5.4 (in-lb/in ²) 946 (J/m ²)

¹**Fiber and cure cycle:** Arovex tested with Grafil TR30 3K 2 X2 Twill 200 FAW carbon fiber with a resin content of 40%, 12 plies, and cured at 121°C (250°F) and 80 psi for one hour (others available).

Prepreg Storage Life

- Tack life – 21 days @ 22°C (72°F)
- Out life – 30 days @ 22°C (72°F)
- Shelf life – 1 year @ -18°C (0°F)

Cure Timing

(Recommended) Ramp temperature 1 - 4°C per minute to desired cure temperature below. Hold at desired temperature for designated time below. Minimum pressure is 14 psi (21 in Hg min), maximum autoclave pressure 100 psi and recommended 50 psi to 90 psi.

Table 3 | Cure Cycle

Cure Temperature (°C)	Cure Time (Hours)
82.2	8
93.3	4
104.4	2
121.1	1
137.8	0.25
177	5 minutes

Figure 1 | Rheology Characteristics

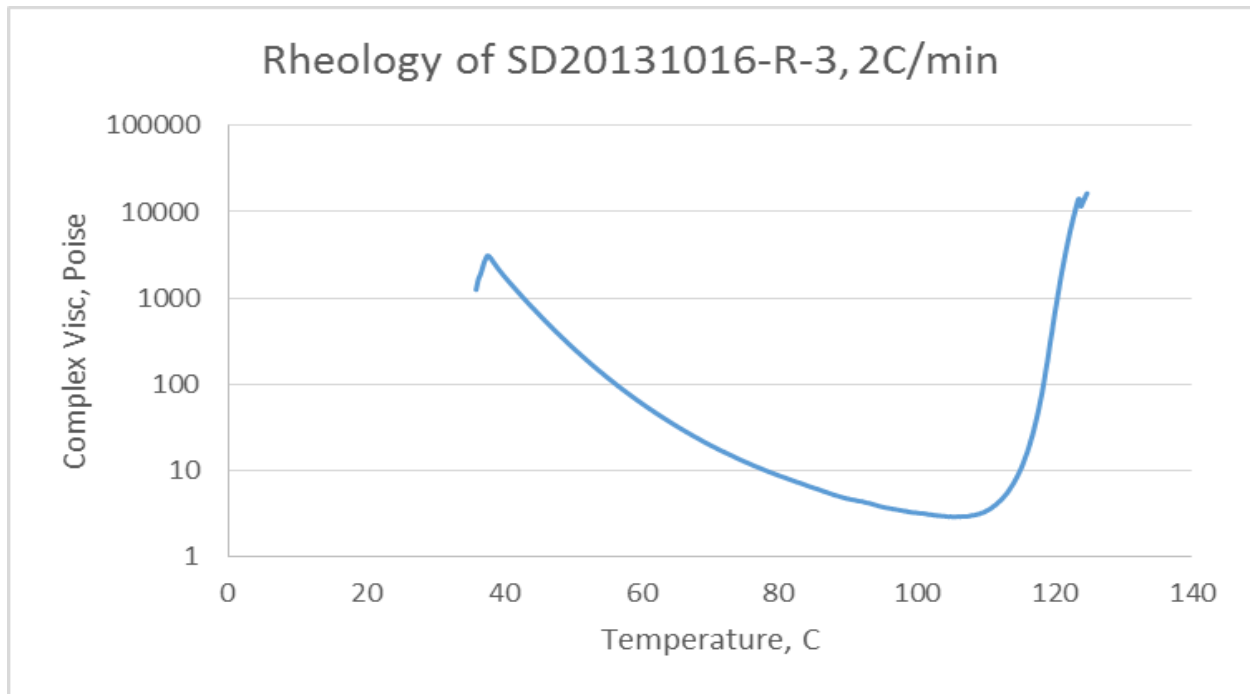
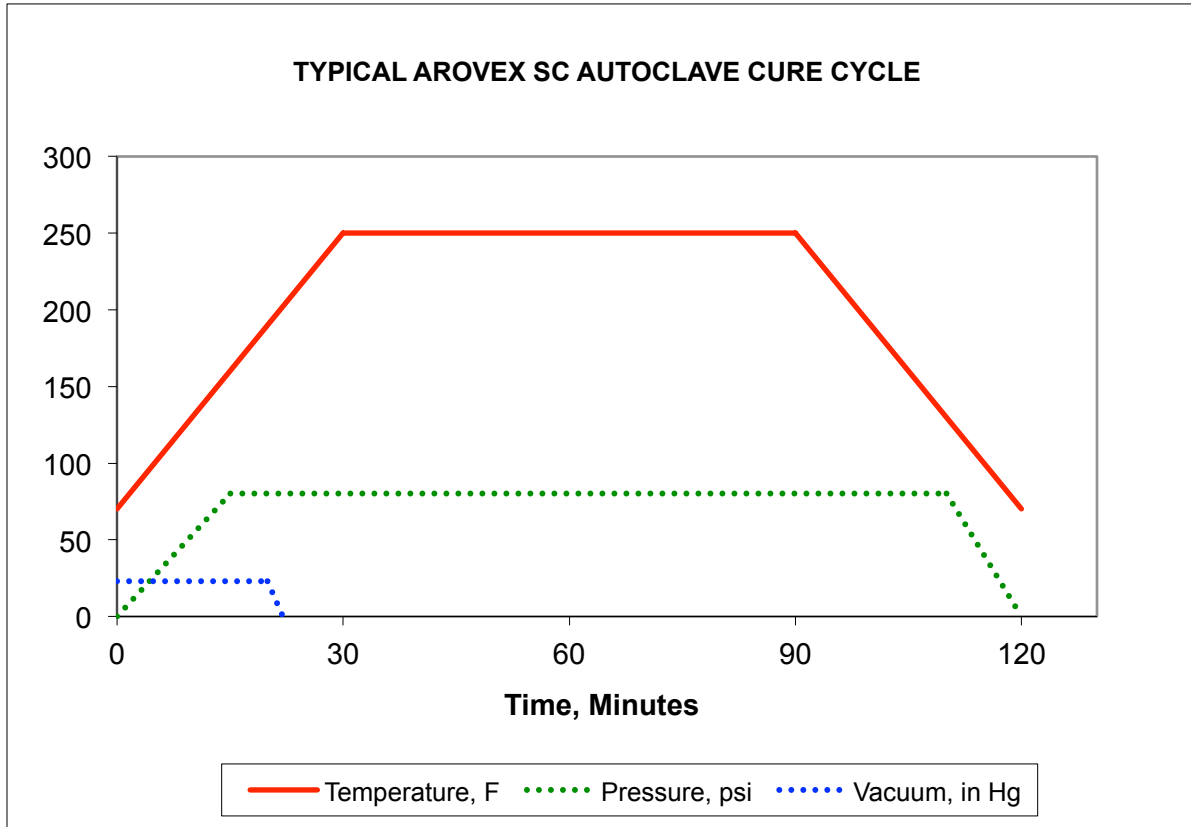


Figure 2 | Autoclave Cure Cycle



Safety Handling

Zyvex Technologies provides its customers with a product specific Material Safety Data Sheet (MSDS) to cover potential health effects, safe handling and use information.

Zyvex encourages its customers to review all relevant MSDS prior to use.

Disclaimer

Zyvex Technologies believes that the technical data provided is accurate as of the published date. Performance values are considered representative but are not intended as a specification.

Contact Zyvex

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