Arovex® 250 Prepreg System
Zyvex Nano-Engineered Composite

Technical Data Sheet September 2013

Description

Arovex® 250 Prepreg is a 180°F (82°C) to 280°F (138°C) curing carbon nanotube strengthened epoxy prepreg suitable for numerous composites applications. Normal curing takes place at 250°F (121°C).

Arovex 250 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 Availability

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

Prepreg Processing

Arovex 250 processes as easily as conventional prepregs and has a long out-life for easier handling and processing. The prepreg is available in low, medium, and high tack levels. It has excellent retention of tack and drape with a 21 day tack-life and 30 day out-life at 72°F (22°C), and 1 year storage shelf life at 0°F (-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

Mechanical Properties

Table 2 | Mechanical Characteristics – Arovex 250 Resin with Toho UTS50 E13 12K 800tex Carbon Fiber Unitape

Test[12]	Test Method	0° Value	90° Value
Flexural Strength	ASTM D 790	265 (ksi) 1827 (Mpa)	16.4 (ksi) 113 (Mpa)
Flexural Modulus	ASTM D 790	25.5 (Msi) 177 (Gpa)	1.3 (Msi) 9 (Gpa)
Compressive Strength	SAC MA SRM 1R-94	170 (ksi) 1172 (Mpa)	32.5 (ksi) 225 (Mpa)
Compressive Modulus	SACMA SRM 1R-94	20.4 (Msi) 141 (Gpa)	1.5 (Msi) 10 (Gpa)
Tensile Strength	ASTM D 3039	371 (ksi) 2258 (Mpa)	6.7 (ksi) 46 (Mpa)
Tensile Modulus	ASTM D 3039	22.0 (Msi) 152 (Gpa)	1.4 (Msi) 10 (Gpa)
Poisson's Ratio	ASTM D 3039	0.34	--
Short Beam Shear Strength	ASTM D 2344	12.0 (ksi) 83 (Mpa)	--
Glass Transition Temperature	ASTM D 7028-07 Peak Tan Delta by DMA	280 (°F) 138 (°C)	--
Glc Strain Energy Release	ASTM D 5528-07	3.3 (in-lb/in^2) 578 (J/m^2)	--

[1]**Fiber and cure cycle**: Arovex tested with Toho UTS50 E13 12K 800tex carbon fiber with a resin content of 38% and cured at 250°F (121°C) and 80 psi for two hours (others available).

[2]**Testing**: Mechanical Data obtained by independent third party testing. Values normalized to 60% fiber volume. Values are typical and are not intended as a specification value.

Prepreg Storage Life

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

Cure Timing

1. Ramp temperature 3-5°F (1-4°C) per minute to desired cure temperature below.
2. Hold at desired temperature for designated time below.
3. Minimum pressure is 14 psi (21 inches Hg), maximum autoclave pressure 100 psi and recommended 50 psi to 90 psi.

Figure 1 | Cure Characteristics

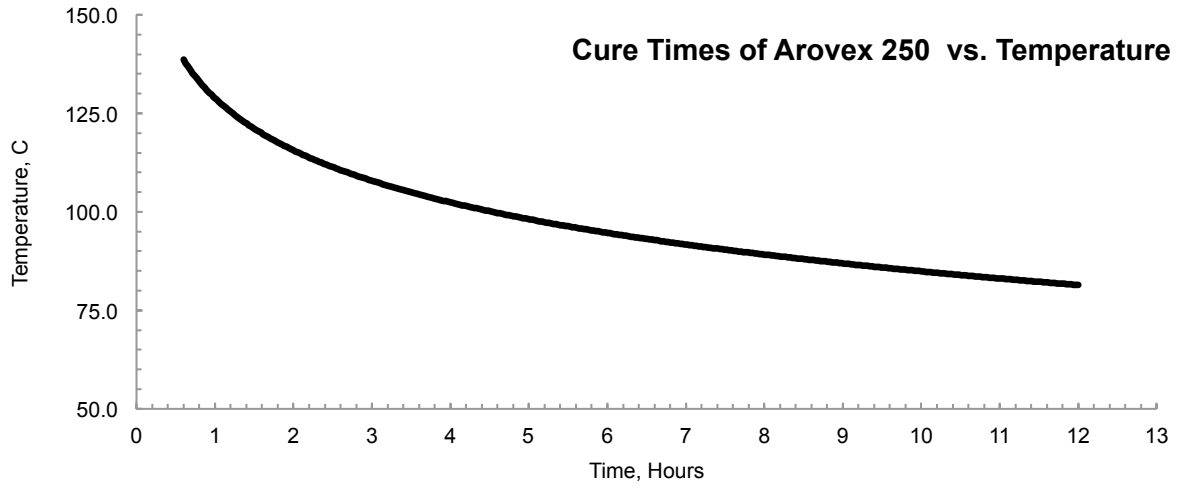


Table 3 | Cure Cycle

Cure Temperature (°C)	Cure Time (Hours)
82.2	12
93.3	6
104.4	4
121.1	2
137.8	0.5

Figure 2 | Rheology Characteristics

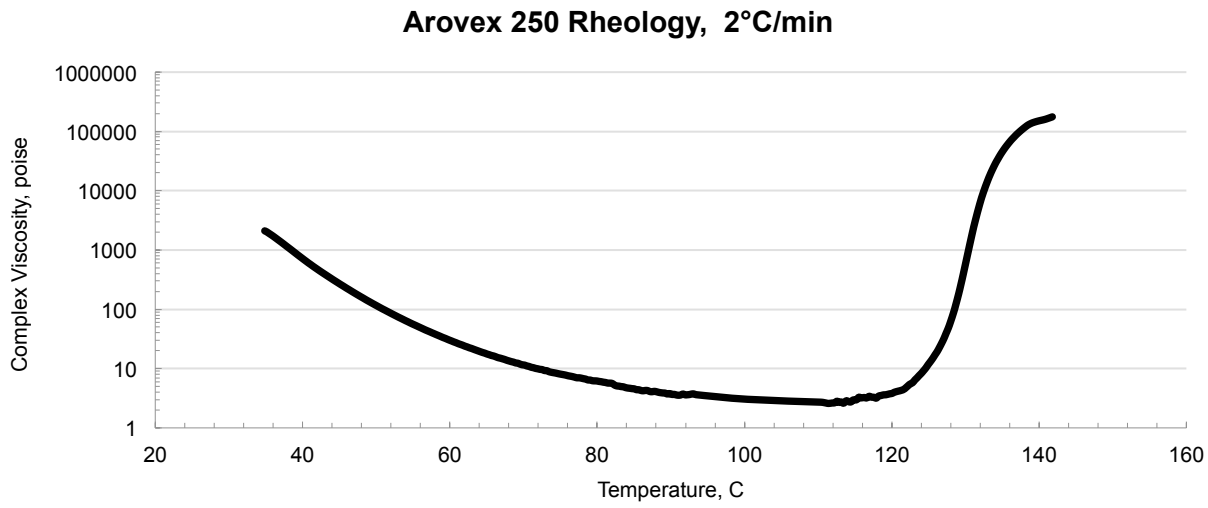


Figure 3 | Autoclave Cure Cycle

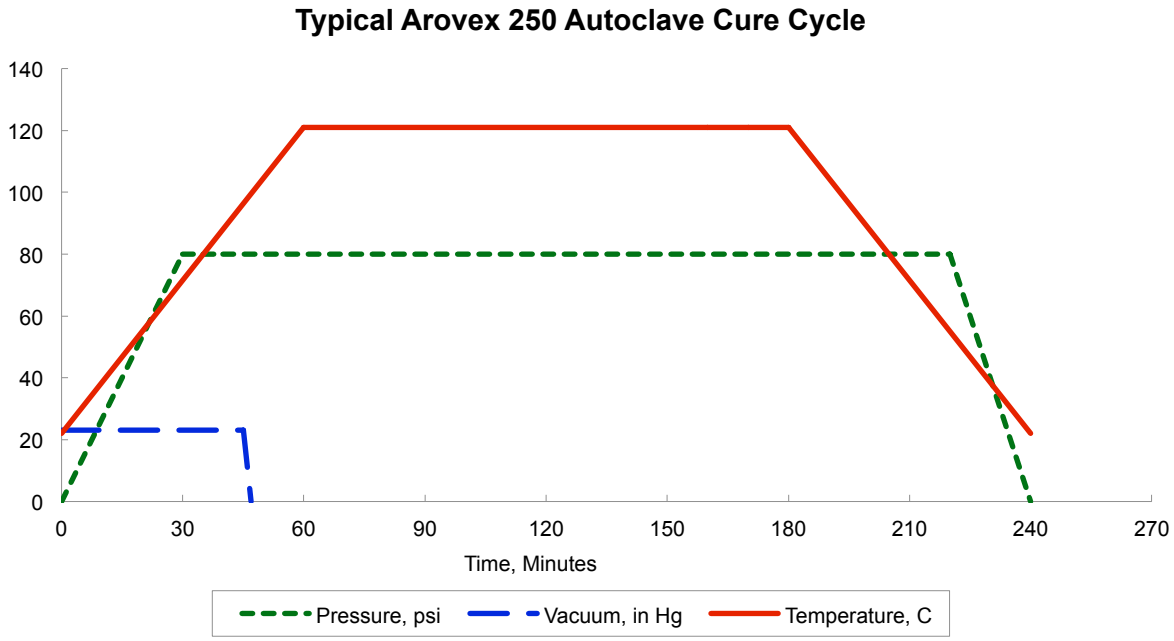


Figure 4 | Vacuum Cure Cycle [Short]

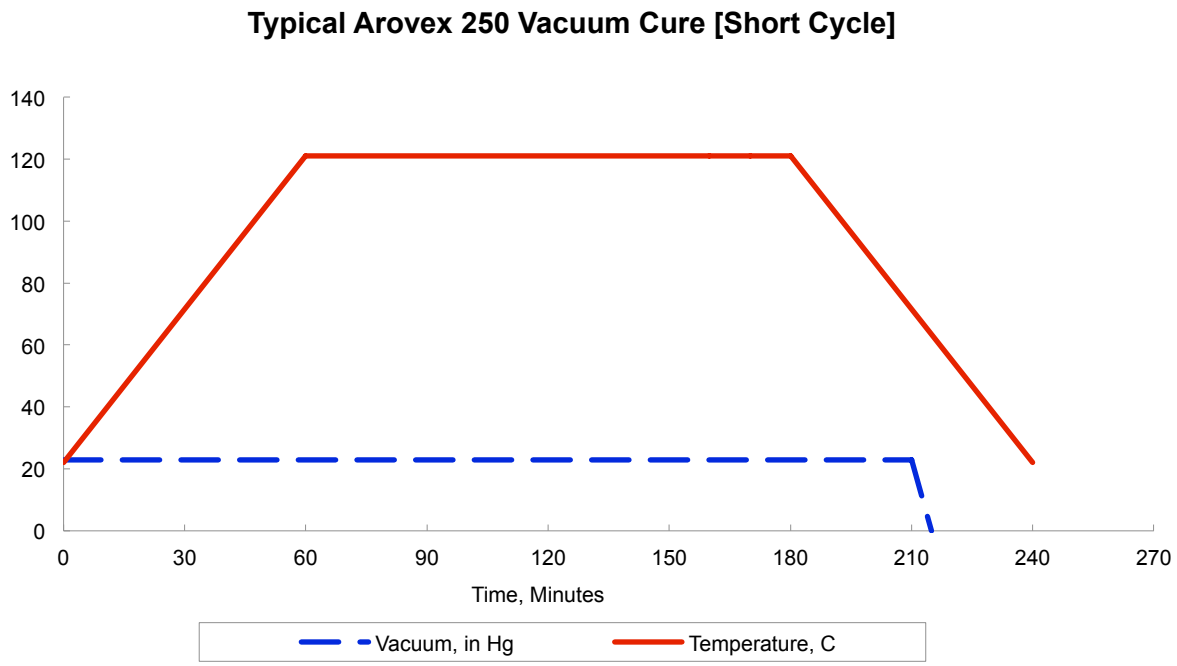


Figure 5 | Vacuum Cure Cycle [Long]

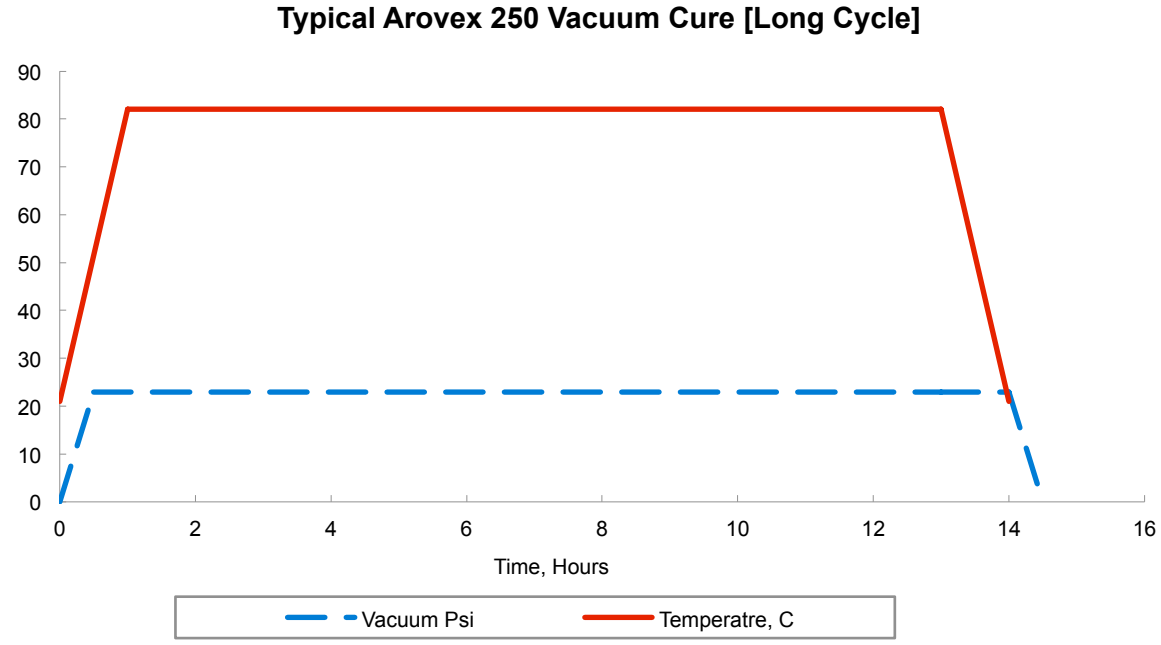
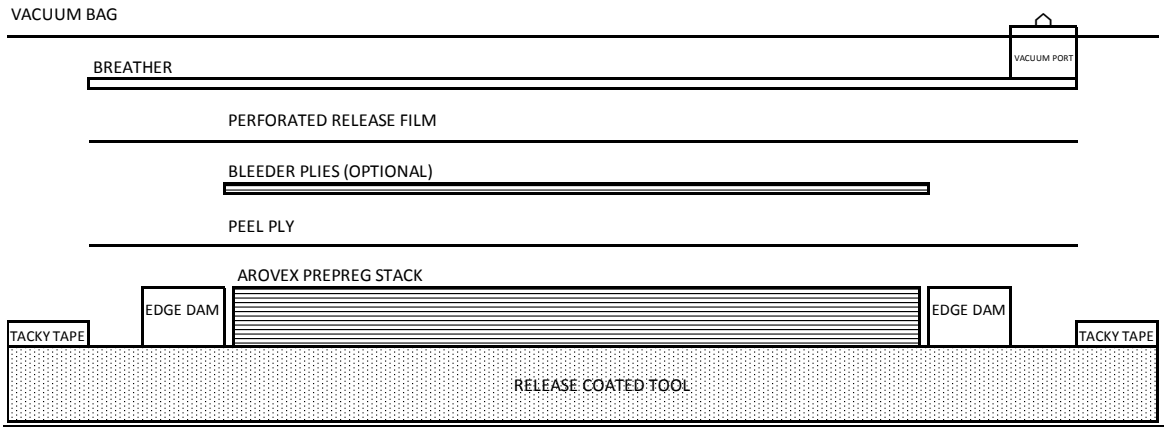


Figure 6 | Standard Lay-Up



Gel Timing

Figure 7 | Gel Characteristics

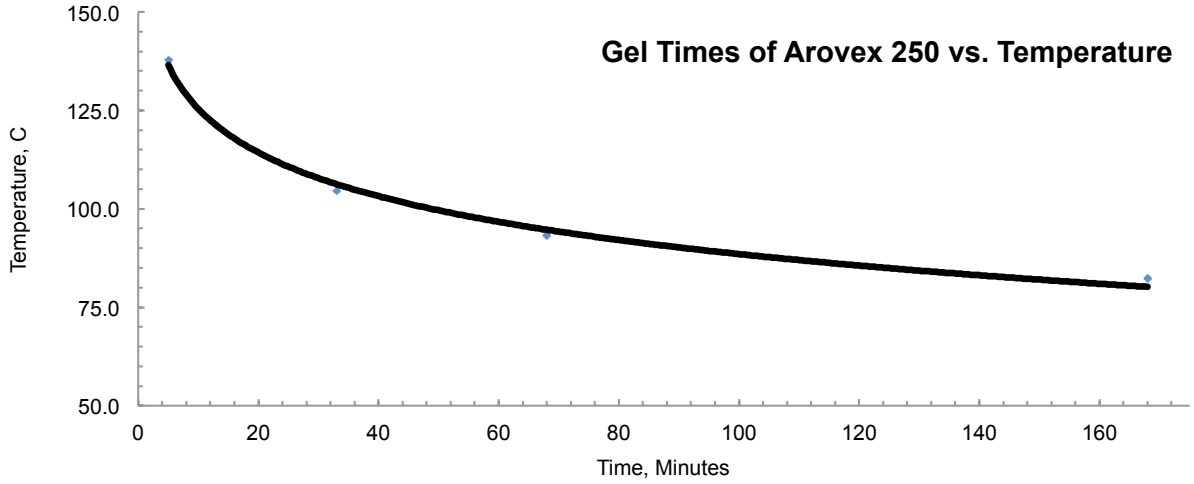


Table 4 | Gel Cycle

Gel Temperature (°C)	Gel Time (Minutes)
82.2	168
93.3	68
104.4	33
121.1	13
137.8	5

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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