PRO-SET®

Technical Data

HTP 182
HTP 284

HIGH-TEMP LAMINATING EPOXY

The New Standard

COMBINED FEATURES

High-temperature, high-performance epoxy formulation for synthetic composite part and tooling manufacture.

T_g as high as 300°F (149°C) with proper post cure. Provides excellent temperature stability and great part cosmetics.

Fast cure speed hardener provides 1 to 2 hour working time at 72°F (22°C). A typical laminate will gel in 4 to 6 hours at room temperature.

Medium viscosity for wet out of synthetic composite fabrics.

Elevated temperature cure is required. Parts can be pulled after 24-48 hours at room temperature or sooner after a mild initial cure of 90-110°F (32-43°C). See chart for post cure information.

Quality-control tinting is available at no extra charge; simply add "QC" after the product code on your order.

Shelf life is 3 years for resin and 18 months for hardener when properly stored[2].

EPOXIES for Laminating Infusion Tooling Assembly

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888-377-6738

ISO9001:2015 Certified

Rev 2 / Sept 2020

HANDLING PROPERTIES

Property	Standard	Units	72°F (22°C)
150g Pot Life	ASTM D2471	minutes	40
500g Pot Life	ASTM D2471	minutes	38
Viscosity Mixed	ASTM D2196	cP	2,550
Viscosity (resin)	ASTM D2196	cP	8,200
Viscosity (hardener)	ASTM D2196	cP	240

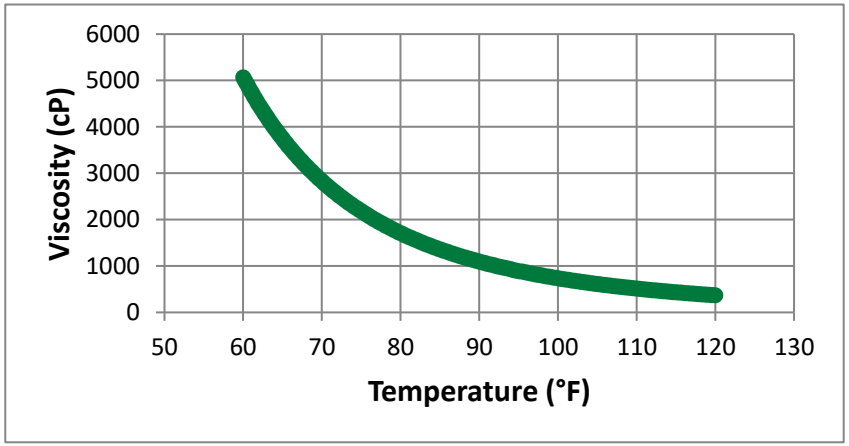
MIX RATIO

Method	Resin:Hardener	Resin:Hardener
Weight	4.70:1	100:21.5
Weight Range	5.26:1 - 4.54:1	100:19.0 - 100:22.0
Volume	4.00:1	100:25.0
Volume Range	4.53:1 - 3.91:1	100:22.1 - 100:25.6

DENSITY

State	Units	72°F (22°C)
Cured	lb/gal (g/cc)	9.85 (1.18)
Resin	lb/gal (g/cc)	9.72 (1.17)
Hardener	lb/gal (g/cc)	8.37 (1.00)

VISCOSITY VS TEMPERATURE



Test specimens were neat epoxy (without fiber reinforcement).
Typical values, not to be construed as specification.

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HIGH-TEMP LAMINATING EPOXY

MECHANICAL PROPERTIES

Property	Standard	Units	RT + 140°F (60°C) x 2hr + 275°F (135°C) x 12hr	
Hardness	ASTM D2240	Type D	94	
Compression Yield	ASTM D695	psi (MPa)	14,500 (100)	
Tensile Strength	ASTM D638	psi (MPa)	10,300 (71)	
Tensile Modulus	ASTM D638	psi (GPa)	4.42E+05 (3.05)	
Tensile Elongation	ASTM D638	%	5.3	
Flexural Strength	ASTM D790	psi (MPa)	14,535 (100)	
Flexural Modulus	ASTM D790	psi (GPa)	4.06E+05 (2.8)	
Coefficient of Thermal Expansion	ASTM E831	in/(in*°F) (µm/(m*°C)	2.98 E-05 (53.68	@ -22°F-86°F (-30°C-30°C)
			4.52 E-05 (81.32)	@ 86°F-248°F (30°C-120°C)

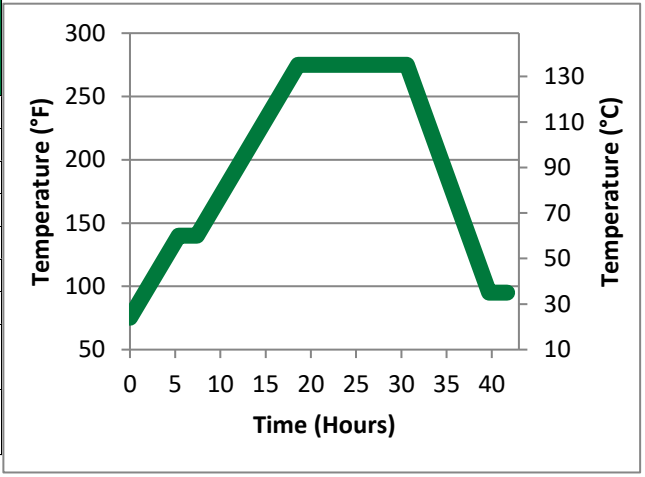
THERMAL PROPERTIES

Property	Standard	Units	RT + 140°F (60°C) x 2hr + 275°F (135°C) x 12hr
Tg DMA Peak Tan Delta	ASTM E1640[1]	°F (°C)	318 (159)
Tg DMA Onset Storage Modulus	ASTM E1640[1]	°F (°C)	298 (148)
Tg DSC Onset–1st Heat	ASTM E1356	°F (°C)	300 (149)
Heat Deflection Temperature	ASTM D648	°F (°C)	280 (138)

[1] 1 Hz, 3°C per minute.

[2] Store PRO-SET® Epoxy resins and hardeners at room temperature in sealed containers until shortly before use. As with many high-performance epoxy resins, repeated exposure to low temperatures during storage may cause the resin to crystallize. If this occurs, warm the resin to 125°F and stir to dissolve crystals. Hardeners may form carbamation when exposed to CO_2 and moisture in the atmosphere for extended periods of time. Prevent carbamation by protecting hardeners from exposure until immediately prior to processing.

POST CURE SCHEDULE



Post cure 140°F (60°C) x 2 hr + 275°F (135°C) x 12 hr with ramp rates no greater than 12°F/hr, to achieve maximum properties. For larger parts, additional dwells may be required.

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