



# PRO-SET®

## Technical Data

# LAM-145

# LAM-224

## LAMINATING EPOXY

### COMBINED FEATURES

Medium viscosity for good wet out of all synthetic composite fabrics and core materials.

Thixotroped to prevent drain out in heavy fabrics and on vertical surfaces.

High tack to help hold heavy fabric and core in place on vertical surfaces.

Fast cure speed hardener provides a 40 minute working time at 77°F (25°C). A typical laminate will be gelled in about 1.5 to 2 hours.

**Optimized** for hand wet out and machine impregnation in contact molding, vacuum bagging and Light RTM applications with a minimum cure temperature of 60°F (16°C).

Room temperature cure properties suitable for many composite components and structures.

$T_g$  as high as 223°F (106°C) with proper post cure providing excellent temperature stability and great part cosmetics.

The New  
Standard

EPOXIES for  
Laminating  
Infusion  
Tooling  
Assembly

Gougeon Brothers, Inc.  
P.O. Box 908  
Bay City, MI 48707  
prosetepoxy.com  
888-377-6738

ISO9001:2015 Certified  
Rev 5/ Dec 2021

### HANDLING PROPERTIES

Property	Standard	Units	72°F (22°C)	77°F (25°C)	85°F (29°C)
150g Pot Life	ASTM D2471	minutes	13-17	11-15	9-11
500g Pot Life	ASTM D2471	minutes	13-17	11-15	9-11
Viscosity Mixed	ASTM D2196	cP	2287	2059	1565
Viscosity (resin)	ASTM D2196	cP	10,000		
Viscosity (hardener)	ASTM D2196	cP	75		
Shear Thinning Index	ASTM D2196	–	1.21		

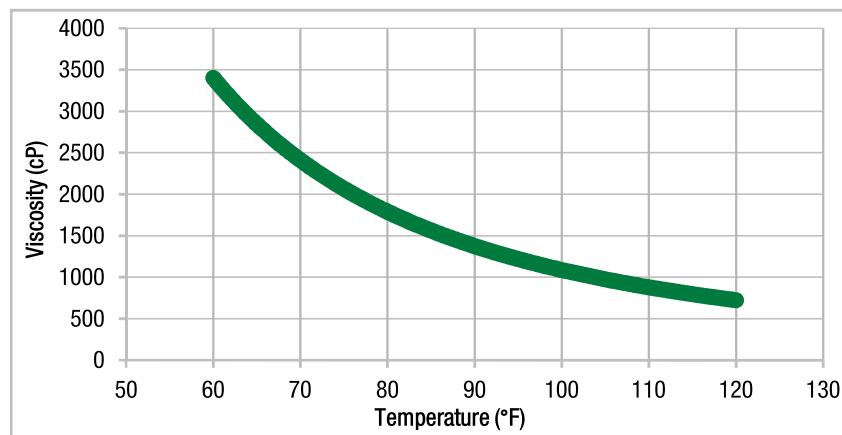
### MIX RATIO

Method	Resin:Hardener	Resin:Hardener
Weight	3.5:1	100:28.6
Weight Range	3.3:1-4.1:1	100:30.2-100:24.7
Volume	3.0:1	100:33.3
Volume Range	2.9:1-3.5:1	100:35.1-100:28.7

### DENSITY

State	Units	72°F (22°C)
Cured	lb/gal (g/cc)	9.76 (1.17)
Resin	lb/gal (g/cc)	9.75 (1.17)
Hardener	lb/gal (g/cc)	8.38 (1.00)

### VISCOSITY VS TEMPERATURE



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



# LAM-145~LAM-224

## LAMINATING EPOXY

### MECHANICAL PROPERTIES

Property	Standard	Units	72°F (22°C) x 4 wk	77°F (25°C) x 2 wk	RT Gelation + 120°F (49°C) x 8 hrs	RT Gelation + 140°F (60°C) x 8 hrs	RT Gelation + 180°F (82°C) x 8 hrs
Hardness	ASTM D2240	Type D	86	88	83	85	87
Compression Yield	ASTM D695	psi (MPa)	15,100 (104)	14,200 (98)	15,000 (103)	15,000 (103)	15,000 (103)
Tensile Strength	ASTM D638	psi (MPa)	10,800 (74)	11,100 (77)	11,000 (76)	11,000 (76)	11,500 (79)
Tensile Modulus	ASTM D638	psi (GPa)	5.61E+05 (3.87)	5.49E+05 (3.79)	5.44E+05 (3.75)	4.93E+05 (3.4)	4.75E+05 (3.28)
Tensile Elongation	ASTM D638	%	3.1	4.9	4.4	4.4	6.7
Flexural Strength	ASTM D790	psi (MPa)	17,800 (123)	17,000 (117)	18,400 (127)	18,600 (128)	20,300 (140)
Flexural Modulus	ASTM D790	psi (GPa)	5.45E+05 (3.76)	4.72E+05 (3.25)	5.24E+05 (3.61)	5.07E+05 (3.5)	4.88E+05 (3.36)

### THERMAL PROPERTIES

Property	Standard	Units	72°F (22°C) x 4 wk	77°F (25°C) x 2 wk	RT Gelation + 120°F (49°C) x 8 hrs	RT Gelation + 140°F (60°C) x 8 hrs	RT Gelation + 180°F (82°C) x 8 hrs
Tg DMA Peak Tan Delta	ASTM E1640 <sup>1</sup>	°F (°C)	180 (82)	177 (80)	208 (98)	216 (102)	242 (117)
Tg DMA Onset Storage Modulus	ASTM E1640 <sup>1</sup>	°F (°C)	151 (66)	151 (66)	166 (75)	181 (83)	223 (106)
Tg DSC Onset– 1st Heat	ASTM E1356	°F (°C)	137 (58)	135 (57)	165 (74)	182 (84)	211 (99)
Heat Deflection Temperature	ASTM D648	°F (°C)	138 (59)	137 (58)	154 (68)	169 (76)	186 (86)
Tg DSC Ultimate	ASTM E1356	°F (°C)			213 (101) <sup>2</sup>		

<sup>1</sup> 1 Hz, 3°C per minute.

<sup>2</sup> Additional post cure may be required; contact Technical Department for details.

<sup>3</sup> 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<sub>2</sub> and moisture in the atmosphere for extended periods of time. Prevent carbamation by protecting hardeners from exposure until immediately prior to processing.



Shelf Life



QC Tinting Available

Rev 5/ Dec 2021