

PRO-SET®

Technical Data

LAM-125 LAM-224

LAMINATING EPOXY

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

ISO9001:2006 Certified

Rev 2 / Dec 2013

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COMBINED FEATURES

Low viscosity for quick wet out of synthetic composite fabrics; especially effective with Kevlar® and carbon fiber.

Fast cure speed hardener provides 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.

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

T_g as high as 193°F (90°C) with proper post cure providing excellent temperature stability and great part cosmetics.

Cost effective, high performance epoxy formulation for synthetic composite manufacturing.

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

HANDLING PROPERTIES

Property	Standard	Units	72°F (22°C)	77°F (25°C)	85°F (29°C)
150g Pot Life	ASTM D2471	minutes	17	13	11
500g Pot Life	ASTM D2471	minutes	17	12	11
Viscosity Mixed	ASTM D2196	cP	694	616	501
Viscosity (resin)	ASTM D2196	cP	1731		
Viscosity (hardener)	ASTM D2196	cP	75		

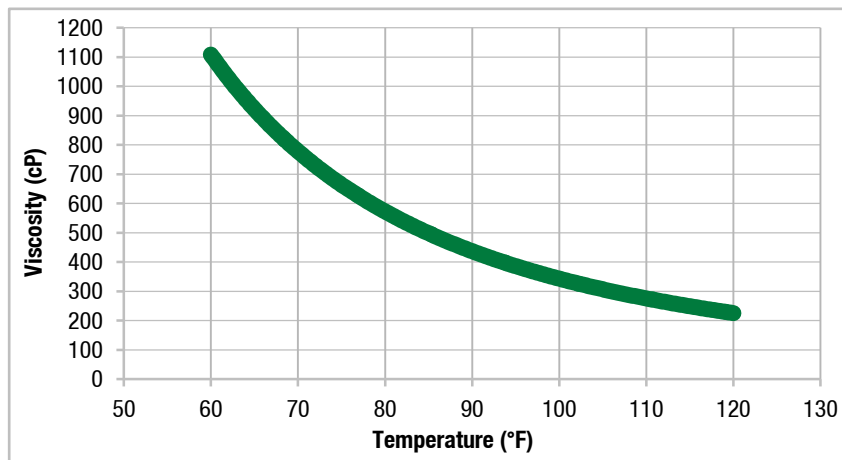
MIX RATIO

Method	Resin:Hardener	Resin:Hardener
Weight	3.5:1	100:28.6
Weight Range	3.96:1–3.24:1	100:25.2–100:30.8
Volume	3.00:1	100:33.3
Volume Range	3.47:1–2.84:1	100:28.9–100:35.3

DENSITY

State	Units	72°F (22°C)
Cured	lb/gal (g/cc)	9.69 (1.16)
Resin	lb/gal (g/cc)	9.58 (1.15)
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.

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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	85	87	81	82	86
Compression Yield	ASTM D695	psi (MPa)	15,800 (109)	16,300 (112)	14,600 (101)	14,600 (101)	14,600 (101)
Tensile Strength	ASTM D638	psi (MPa)	10,900 (75)	11,400 (79)	11,000 (76)	11,000 (76)	11,100 (77)
Tensile Modulus	ASTM D638	psi (GPa)	5.35E+05 (3.69)	5.72E+05 (3.94)	5.47E+05 (3.77)	5.22E+05 (3.6)	4.95E+05 (3.41)
Tensile Elongation	ASTM D638	%	3.2	4.0	5.6	5.6	5.6
Flexural Strength	ASTM D790	psi (MPa)	17,500 (121)	18,300 (126)	18,900 (130)	18,900 (130)	19,700 (136)
Flexural Modulus	ASTM D790	psi (GPa)	5.26E+05 (3.63)	5.41E+05 (3.73)	5.12E+05 (3.53)	5.07E+05 (3.5)	4.75E+05 (3.28)

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 ¹	°F (°C)	170 (77)	170 (76)	195 (91)	201 (94)	216 (102)
Tg DMA Onset Storage Modulus	ASTM E1640 ¹	°F (°C)	151 (66)	151 (66)	171 (77)	177 (81)	193 (90)
Tg DSC Onset– 1st Heat	ASTM E1356	°F (°C)	139 (60)	138 (59)	155 (68)	178 (81)	184 (84)
Heat Deflection Temperature	ASTM D648	°F (°C)	135 (57)	137 (58)	148 (64)	161 (72)	179 (82)
Tg DSC Ultimate	ASTM E1356	°F (°C)			192 (89) ²		

¹ 1 Hz, 3°C per minute.

² Additional post cure may be required; contact Technical Department for details.

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COMBINED FEATURES

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

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

Optimized for hand wet out and machine impregnation in contact molding, vacuum bagging and filament winding applications.

Excellent for taping and tabbing operations in composite structure assembly.

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.

Cost effective, high performance epoxy formulation for synthetic composite manufacturing.

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

HANDLING PROPERTIES

Property	Standard	Units	72°F (22°C)	77°F (25°C)	85°F (29°C)
150g Pot Life	ASTM D2471	minutes	15	13	10
500g Pot Life	ASTM D2471	minutes	15	13	10
Viscosity Mixed	ASTM D2196	cP	1705	1360	970
Viscosity (resin)	ASTM D2196	cP	6890		
Viscosity (hardener)	ASTM D2196	cP	75		

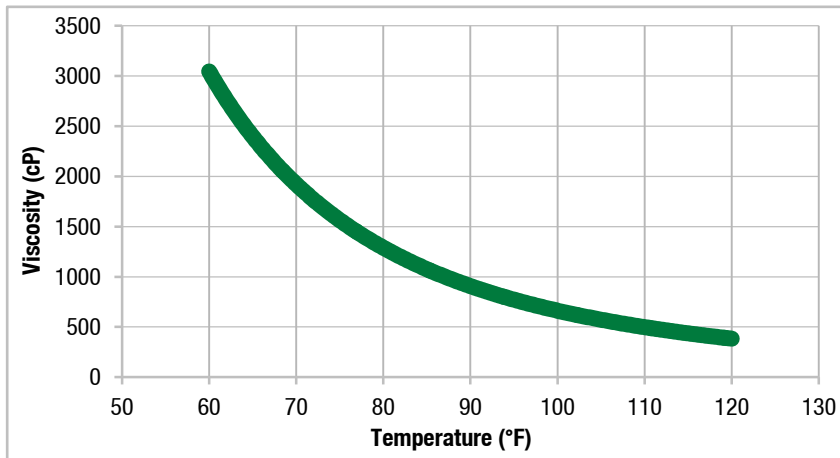
MIX RATIO

Method	Resin:Hardener	Resin:Hardener
Weight	3.5:1	100:28.6
Weight Range	3.97:1–3.25:1	100:25.2–100:30.8
Volume	3.00:1	100:33.3
Volume Range	3.43:1–2.80:1	100:29.2–100:35.7

DENSITY

State	Units	72°F (22°C)
Cured	lb/gal (g/cc)	9.76 (1.17)
Resin	lb/gal (g/cc)	9.71 (1.16)
Hardener	lb/gal (g/cc)	8.38 (1.00)

VISCOSITY VS TEMPERATURE



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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 ¹	°F (°C)	180 (82)	177 (80)	208 (98)	216 (102)	242 (117)
Tg DMA Onset Storage Modulus	ASTM E1640 ¹	°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) ²		

¹ 1 Hz, 3°C per minute.

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