

# PRO-SET®

## Technical Data

# M1019~M2043

### BLACK TOOLING SURFACE COAT 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

ISO9001:2008 Certified

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### COMBINED FEATURES

**Formulated for use** in the mold when fabricating synthetic composite parts and to work with polymer release systems or traditional wax.

**Fast cure speed** hardener allows a laminate skin to be applied between 2.5 and 4 hours at 72°F (22°C) without any surface preparation.

**Elevated temperature cure is required;** thermal and mechanical properties suitable for composite components and high temperature tooling and molds.

**T<sub>g</sub> as high as 206°F (97°C)** with proper post cure providing excellent temperature stability and great part cosmetics.

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

**Minimum coating thickness** of 6 to 8 mils required to prevent fisheyes on the surface.

**Coverage** at 10 mils is approximately 150 sq feet per mixed gallon of resin and hardener.

**Shelf life** is 3 years for resin and 2 years for

*Some separation may occur during storage. Stir resin before mixing with hardener.*

### HANDLING PROPERTIES

Property	Standard	Units	72°F (22°C)
100g Pot Life	ASTM D2471	minutes	28-36
Viscosity Mixed	ASTM D2196	cP	3,900
Viscosity (resin)	ASTM D2196	cP	130,000
Viscosity (hardener)	ASTM D2196	cP	180

### MIX RATIO

Method	Resin:Hardener	Resin:Hardener
Weight	3.8:1	100:26.5
Weight Range	3.59:1–4.22:1	100:27.9–100:23.7
Volume	3.23:1	100:31.0
Volume Range	3.13:1–3.68:1	100:32.0–100:27.2

### DENSITY

State	Units	72°F (22°C)
Cured	lb/gal (g/cc)	9.74 (1.17)
Resin	lb/gal (g/cc)	10.3 (1.24)
Hardener	lb/gal (g/cc)	8.3 (0.99)

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 2 wk	RT Gelation + 125°F (52°C) x 8 hrs	RT Gelation + 140°F (60°C) x 8 hrs	RT Gelation + 140°F (60°C) x 16 hrs	RT Gelation + 180°F (82°C) x 8 hrs
Hardness	ASTM D2240	Type D	86		89		89
Compression Yield	ASTM D695	psi (MPa)	16,600 (114)		17,900 (123)	18,700 (129)	17,800 (123)
Tensile Strength	ASTM D638	psi (MPa)	4,760 (33)	8,270 (57)	8,850 (61)	8,800 (61)	9,840 (68)
Tensile Modulus	ASTM D638	psi (GPa)	8.52E+05 (5.87)	8.51E+05 (5.87)	7.85E+05 (5.41)	8.19E+05 (5.65)	8.32E+05 (5.74)
Tensile Elongation	ASTM D638	%	0.7	1.3	1.5	1.4	1.8
Flexural Strength	ASTM D790	psi (MPa)	9,170 (63)	15,100 (104)	17,500 (121)	15,900 (110)	17,600 (121)
Flexural Modulus	ASTM D790	psi (GPa)	6.88E+05 (4.74)	7.05E+05 (4.86)	7.27E+05 (5.01)	6.95E+05 (4.79)	6.53E+05 (4.5)

### THERMAL PROPERTIES

Property	Standard	Units	72°F (22°C) x 2 wk	RT Gelation + 125°F (52°C) x 8 hrs	RT Gelation + 140°F (60°C) x 8 hrs	RT Gelation + 140°F (60°C) x 16 hrs	RT Gelation + 180°F (82°C) x 8 hrs
Tg DSC Onset– 1st Heat	ASTM E1356	°F (°C)	128 (53)	156 (69)	171 (77)	175 (79)	199 (93)
Heat Deflection Temperature	ASTM D648	°F (°C)	129 (54)	153 (67)	167 (75)	166 (74)	195 (91)
Tg DSC Ultimate	ASTM E1356	°F (°C)			206 (97) <sup>1</sup>		

<sup>1</sup> Additional post cure may be required; contact Technical Department for details.

<sup>2</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.

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