



LAMINATING
EPOXY

ADHESIVES

PROCESS
EQUIPMENT

Technical Data

M1002 Resin/229 Hardener

Toughened Laminating Epoxy

The M1002/229 laminating epoxy system is formulated for high load or high peel applications and situations where the bondline area is less than optimum. Examples are carbon fiber skins on honeycomb core material or taping with carbon onto cured carbon skinned panels or structures. The 229 Hardener provides approximately 2.5 - 4 hrs. of open time at 72° F.

MIXING

Combine the M1002 Resin with PRO-SET 229 Hardener following the ratios by weight or volume shown in the table. Stir the mixture thoroughly and transfer to impregnator, roller pan, or apply directly to the laminate surface.

CURING

The M1002/229 mixtures maintain excellent working properties until gel takes place. The mixture will temper and continue to cure over the next several days at room temperature, and after two weeks will reach an acceptable degree of cure for many applications. Elevated temperature post cure will increase the degree of cure and improve the mechanical and thermal properties.

We recommend building sample panels using proposed materials and manufacturing processes to confirm working and curing characteristics under your shop conditions.

HANDLING CHARACTERISTICS *(Not for specification purposes)*

Property	Mixed	
Viscosity @ 72° F (ASTM D-2393-86)	1,400 cps	
Mix Ratio (M1002:229)	Target	Acceptable Range
By weight	100:24	100:25.6 – 100:21.7
By volume	100:29	100:30.8 – 100:26.2
Pot Life (ASTM D-2471-71)	100g	
@ 72° F	54 minutes	

Pro-Set Inc.
P.O. Box 656
Bay City, MI 48707 USA
888-377-6738
prosetepoxy.com

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TOUGHENED LAMINATING EPOXY – PHYSICAL PROPERTIES

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Physical Property	Test Method	Cure Schedule	
		Room Temp. x 2 weeks	RT x 15 hr + 140°F x 8 hr
Hardness (Shore D)	ASTM D-2240	80	84
Compression Yield (psi)	ASTM D-695	13,589	14,136
Tensile Strength (psi)	ASTM D-638	7,545	9,688
Tensile Elongation (%)	ASTM D-638	2.1	4.0
Tensile Modulus (psi)	ASTM D-638	4.76E+05	4.52E+05
Flexural Strength (psi)	ASTM D-790	12,429	14,136
Flexural Modulus (psi)	ASTM D-790	4.73E+05	5.99E+05
Heat Deflection Temperature (HDT) (°F)	ASTM D-648	124.0 °F	151.0 °F
Onset of Tg by DSC (°F) **		126.5 °F	152.6 °F
Ultimate Tg by DSC (°F) **		162.1 °F	162.1 °F
Izod Impact, notched (Ft-lb/in)	ASTM D-256	0.579	0.617

Test Specimens were neat epoxy (without fiber reinforcement)

** Determined using a Differential Scanning Calorimeter (DSC). Value reported is the onset of the glass transition

Typical Values; not to be construed as specification