



LAMINATING
EPOXY

ADHESIVES

PROCESS
EQUIPMENT

Technical Data

M1003 Resin/239 Hardener

Thixotropic Laminating Epoxy

The M1003/239 laminating epoxy system is formulated for use in molding situations where resin drain-out is a concern. The shear thinning nature of the system provides very good wet-out of the fibers, but will not drain out on vertical or overhead surfaces. This combination works very well in an impregnator or wet-out machine. The 239 Hardener provides approximately 8-12 hrs. of open time at 72° F.

MIXING

Mix Resin before using. Re-mix if allowed to set for more than a week.

Combine the M1003 Resin with PRO-SET 239 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 M1003/239 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. Elevated temperature post cure is required and 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)	600 cps	
Mix Ratio (M1003:239)	Target	Acceptable Range
By weight	100:26	100:29.0 – 100:23.2
By volume	100:32	100:35.1 – 100:28.1
Pot Life (ASTM D-2471-94)	100g	
@ 72° F	383 minutes	

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LAMINATING EPOXY—PHYSICAL PROPERTIES

M1003 Resin/239 Hardener

Physical Property	Test Method	Cure Schedule			
		RT* x 15 hr + 125°F x 16 hr	RT x 15 hr + 140°F x 8 hr	RT x 15 hr + 140°F x 16 hr	RT x 15 hr + 180°F x 8 hr
Hardness (Shore D)	ASTM D-2240	86	82	85	87
Compression Yield (psi)	ASTM D-695	14,885	14,119	14,505	14,496
Tensile Strength (psi)	ASTM D-638	8,928	9,029	9,320	10,082
Tensile Elongation (%)	ASTM D-638	2.7	3.1	3.5	6.5
Tensile Modulus (psi)	ASTM D-638	4.29E+05	4.47E+05	4.09E+05	4.06E+05
Flexural Strength (psi)	ASTM D-790	17,178	16,787	17,735	18,048
Flexural Modulus (psi)	ASTM D-790	4.60E+05	4.50E+05	4.37E+05	4.43E+05
Heat Deflection Temperature (HDT) (°F)	ASTM D-648	148.0	143.0	164.0	174.0
Onset of Tg by DSC (°F) **		149.4	139.3	164.3	177.8
Ultimate Tg by DSC (°F) **		180.3	171.0	177.6	182.5
Izod Impact, notched (Ft-lb/in)	ASTM D-256	0.89	0.77	0.68	0.91

* Room Temperature is 72° F

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