



**EL-335
EPOXY LAMINATING
SERIES
HIGH TEMPERATURE, HIGH
IMPACT**



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DESCRIPTION

EL-335 series are high temperature laminating systems developed for high performance applications. These systems exhibit greater mechanical shock properties, increased hardness at elevated temperatures, greater degree of flexibility, increased heat distortion and lower viscosity. Used for laminating with graphite, E-Glass, S-Glass and Kevlar fabrics, EL-335 composites exhibit increased impact resistance in the fabrication of parts which will be used in a heat environment where stability and performance are required. Parts made with EL-335 systems will maintain excellent shape. Because hardness and impact strength are high even at elevated temperatures, the systems will withstand vibration and crushing blows which can render other matrix types of part fabrication useless. The handling properties are designed for use in laminating-vacuum bagging-oven cure production processes. Advantages of use include greater mechanical shock properties, increased Shore D hardness at elevated temperatures, greater degree of flexibility, increased heat distortion temperature and lower viscosity for better cloth penetration.

HANDLING CHARACTERISTICS @ 77°F (25°C)

	<u>EL-335R/H</u>	<u>EL-335R/EL-335-2H</u>
Mix Ratio (parts by weight)	100R/20H	100R/13H
Specific Gravity	1.17 gms/cc	1.12 gms/cc
Mixed Viscosity	1,500 cps	2,500 cps
Work Life (228 gram mass)	40-60 minutes.....	90 minutes
Demold Time.....	24 hours.....	24 hours
Complete Cure.....	Reference heat cure schedule on page 2	
Color.....	Light Amber	Light Amber
Shelf Life Resin & hardener (in original unopened containers).....	2 years	2 years

PHYSICAL PROPERTIES (after Heat Cure)

<u>6 Layer, 10 Ounce Glass Fabric Laminate:</u>	<u>EL-335R/H</u>	<u>EL-335R/EL-335-2H</u>
Tensile Strength (ASTM D-638-946)	39,000psi (269MPa)	36,238psi (250MPa)
Tensile Modulus (ASTM D-638-946).....	2,970,000psi (20,477MPa)	2,870,000psi (19,788MPa)
Flexural Strength (ASTM D-790-92).....	47,760psi (329MPa)	39,600psi (273MPa)
Flexural Modulus (ASTM D790-92).....	2,470,000psi (17,030MPa)	2,620,000psi (18,064MPa)
Glass Transition Temperature (Tg by DMA)	212°F (100°C).....	223°F (106°C)

Cast Bar (5" x 1/2" x 1/2")

Compressive Strength (ASTM D-695-91)	16,500psi (114MPa)	16,860psi (116MPa)
Izod Impact Strength (ASTM D-256-93A)	9.10 in-lbf/in	4.73 in-lbf/in
Hardness (ASTM D-2240-91).....	86 Shore D	87 Shore D
Tensile Elongation (ASTM D-638-946)	4%.....	2%
Heat Deflection Temperature @ 66 psi (ASTM D-648-82).....	196°F (91°C).....	214°F (101°C)
Heat Deflection Temperature @ 264 psi (ASTM D-648-82).....	185°F (85°C).....	201°F (94°C)
Coefficient of Thermal Expansion (TMA) (ppm/°F (°C)).....	34 (61)	26 (47)

CURE SCHEDULE

24 hours @ 77°F (25°C)
+ 4 hours @ 200°F (93°C)

HEATING AND COOLING RATES DURING POST CURE

When heat curing composite parts or molds, place model in a room temperature oven and increase temperature at a rate of no more than 50°F (30°C) per hour. When finished, do not remove mold or part from the oven until temperature has been lowered to less than 100°F (38°). Removing a mold or part from an oven heated above 100°F (38°) can result in thermal shock or warp.

EL-335 Series Tech/Revised 1/6/15
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