



EL-335 EPOXY LAMINATING SERIES

PRODUCT BULLETIN



HIGH TEMP, HIGH IMPACT

www.CASSpolymers.com
31200 Stephenson Hwy

800.344.7776
Madison Heights MI 48071

ADTECH@CASSpolymers.com
Ph 248.588.2270 Fax 248.588.5909

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 @ 25°C/77°F

	<u>EL-335R/H</u>	<u>EL-335R/EL-335-2H</u>
Mix Ratio (parts by weight)	100R/20H	100R/13H
Mixed Density	9.70 lbs/gal	9.4 lbs/gal
.....	0.042 lbs/cu in	0.040 lbs/cu in
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)	39,000 psi	36,238 psi
Tensile Modulus (ASTM D-638-946)	2.97 x 10 ⁶ psi	2.87 x 10 ⁶ psi
Flexural Strength (ASTM D-790-92)	47,760 psi	39,600 psi
Flexural Modulus (ASTM D790-92).....	2.47 x 10 ⁶ psi	2.62 x 10 ⁶ psi
Glass Transition Temperature (T _g by DMA).....	100°C/212°F.....	106°C/223°F

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

Compressive Strength (ASTM D-695-91).....	16,500 psi	16,860 psi
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).....	3.97%.....	2.00%
Heat Deflection Temperature @ 66 psi (ASTM D-648-82)	91°C/196°F.....	101°C/214°F
Heat Deflection Temperature @ 264 psi (ASTM D-648-82)	85°C/185°F.....	94°C/201°F
Coefficient of Thermal Expansion (ASTM D-696-91)	3.42 x 10 ⁻⁵ in/in/°F	2.62 x 10 ⁻⁵ in/in/°F

Continued on next page

CURE SCHEDULE

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

HEATING AND COOLING RATES DURING POST CURE

When heat curing composite parts, always place the mold in a room temperature oven increasing the temperature at a rate of no more than 13°C/25°F per hour. When finished, allow molds to remain in the heated oven, decreasing the temperature at a rate of no more than 27°C/50°F per hour. Never remove the mold or parts from the oven until temperature has been lowered to less than 38°C/100°F. Removing a mold or parts from an oven heated above 38°C/100°F can result in thermal shock and warpage of the part or mold.

EL-335 Series Tech/Revised 5/20/10
Supercedes 12/13/06