

Product Bulletin



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EL-315-IHL, EL-315-1
 EPOXY LAMINATING - HIGH TEMP
 2 HARDENERS AVAILABLE
 FOR USE IN HIGH PERFORMANCE
 AUTOCLAVE COMPOSITE TOOLS

0302

DESCRIPTION

EL-315 Series is a premium high temperature epoxy laminating system developed to withstand extreme heat conditions in composite tooling applications such as autoclave; bonding jigs; oven cured processing or heat induction resin transfer molding. Test results show the physical and mechanical properties of the EL-315 series to be among the highest attainable in high temperature epoxy laminating systems. This advantage minimizes CTE differentials and stresses, resulting in a dimensionally stable and durable composite mold or part.

EL-315 is available with a choice of two different hardeners to allow adequate construction and bagging time on large or small laminates. EL-315 series contains no MDA or VCHD.

HANDLING CHARACTERISTICS @ 25°C/77°F

	<u>EL-315-IHL</u>	<u>EL-315-1</u>
Mix Ratio (parts by weight).....	100R/25H	100R/19H
(parts by volume).....	4.082R/1H	4.59R/1H
Density (Mixed).....	9.87 lbs/gal	9.12 lbs/gal
.....	0.043 lbs/cu in	0.039 lbs/cu in
Specify Gravity.....	1.18 gms/cc	1.09 gms/cc
Mixed Viscosity	2,500-4,000 cps	2,000-3,000 cps
Work Life	50-75 minutes	50-60 minutes
Demold Time.....	24 hrs	24 hrs
.....	(3 hrs @ 150°F)	(3 hrs @ 150°F)
Color.....	Black	Amber
Storage Life (Containers tightly closed).....	1 Year	1 Year

PHYSICAL PROPERTIES

Ultimate Tensile Strength (ASTM D-3039.93).....	33,690 psi	62,630 psi
Tensile Elongation (ASTM D-3039.93).....	1.752%	1.708%
Tensile Modulus (ASTM D-3039.93).....	2,593,000	4,048,000
Ultimate Flexural Strength (ASTM D-790.92).....	44,540 psi	90,480 psi
Flexural Modulus (ASTM D-790.92).....	2,296,000	4,642,000
Ultimate Compressive Strength (ASTM D-695.91)...	14,370 psi	11,020 psi
Coefficient of Thermal Expansion (ASTM-696.91)....	10.8 x 10 ⁻⁶ in/in/°F	39.5 x 10 ⁻⁶ in/in/°F
Heat Deflection Temperature (ASTM D-648.82).....	320.7°F	306.2°F
Tg by DMA.....	166.3°C/331.3°F	152.1°C/305.8°F
Impact Strength (Notched Izod) (ASTM D-256.93a).	4.5 in-lbs/in	6.47 in-lbs/in
Shrinkage.....	0.0015 in/in	0.0015 in/in
Hardness.....	87-88 Shore D	88-90 Shore D

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CURE SCHEDULE

PRELIMINARY CURE

On Model Cure @ 77°F for 48 Hours

or

On Model Cure @ 77°F for 24 Hours
+ 150°F for 6 Hours

EL-315-IHL or EL-315-1

EL-315-IHL or EL-315-1

You may attach support structure and demold tool after this schedule completed.

POST CURE

Following on Model Cure @ 77°F

or

Following on Model Cure (up to 150°F)

2 Hours @ 150°F

1 Hour @ 200°F

1 Hour @ 250°F

3 Hours @ 350°F

1 Hour @ 200°F

1 Hour @ 250°F

1 Hour @ 300°F

3 Hours @ 350°F

Optional curing at 400°F may sometimes be necessary to condition tool 25°F above required service temperature.

Always allow tools made with ADTECH high temp systems to gel at room temperature before subjecting them to post cure (24 hours is sufficient). This will prevent excessive exotherm and shrinkage from occurring.

When taking tools through a preliminary or post cure phase always place tool in a room temperature oven and increase temperature at a rate of 5°F/minute.

When cooling tools always allow tool to remain in heat environment and decrease temperature at a rate of 10°F/minute. Do not remove tool from heat environment until tool has reached 100°F. Removing tool heated above 100°F can result in thermal shock and warpage.

SPECIFICATIONS

EL-315-IHL: Boeing MMS-102 and M41-03-01 Code RHL and IHL
McDonnell Douglas C1-655, QPL Code L-3