EL-315 SERIES

use with
EL-315-IHL, EL-315-1
and EL-315-2 HARDENERS

PRODUCT BULLETIN

ADTECH Plastic Systems

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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 resin is available with a choice of three different hardeners to allow adequate construction and bagging time on large or small laminates.

HANDLING CHARACTERISTICS @ 77°F (25°C)

	EL-315R/315-IHL	EL-315R/315-1	EL-315R/315-2
Mix Ratio (parts-by-weight)	100R/25H	100R/19H	100R/24H
Specify Gravity	1.18 g/cc	1.09 g/cc	1.14 g/cc
Mixed Viscosity	2,500-4,000 cps	2,000-3,000 cps	4,000-5,000 cps
Work Life	50-75 minutes	50-60 minutes	180-210 minutes
Demold Time	Refer To Recommended Post Cure Schedule		
Color	Clear Amber/Black	Clear Amber/Amber	Clear Amber/Amber
Shelf Life Resin (in original unopened container)	2 years	2 years	2 years
Shelf Life Hardener (in original container)	2 years	2 years	2 years

PHYSICAL PROPERTIES

Tensile Strength (ASTM D-3039.93)	33,690psi (232MPa)	62,630psi (432MPa)	56,090psi (387MPa)
*Tensile Elongation (ASTM D-3039.93)	1.8%	1.7%	not available
Tensile Modulus (ASTM D-3039.93)	2,593,000psi (17,878MPa)	4,048,000psi (27,910MPa)	3,900,000psi (26,890MPa)
Flexural Strength (ASTM D-790.92)	44,540psi (307MPa)	90,480psi (624MPa)	76,200psi (525MPa)
Flexural Modulus (ASTM D-790.92)	2,296,000psi (15,830MPa)	4,642,000psi (32,005MPa)	3,504,000psi (24,159MPa)
*Coefficient of Thermal Expansion(TMA) (ppm/°F (°C))		11 (19)	
*Heat Deflection Temp @264 psi(ASTM D-648.82)	320°F (161°C)	306°F (152°C)	389°F (198°C)
*Tg by DMA	331°F (166°C)	305°F (152°C)	450°F (232°C)
*Notched Izod Impact Strength (ASTM D-256.93a)	4.5 in-lbs/in	6.47 in-lbs/in	4.5 in-lbs/in
*Shrinkage	0.0015 in/in	0.0015 in/in	0.0036 in/in
*Hardness.	88 Shore D	90 Shore D	90 Shore D

(*) Denotes Physical Testing conducted on neat resin castings
All other testing conducted on 6 ply – 7500 Style E-Glass Laminates

Product Technical Bulletin Cont.

PRELIMINARY CURE SCHEDULE

On Model Cure for 24 hours @ 77°F (25°C)
+ 6 hours 150°F (66°C)

You may attach support structure and de-mold tool after this schedule is completed.

POST CURE SCHEDULE

After completing the Preliminary Cure Schedule, complete the following:

1 hour @ 200 F (93°C)
1 hour @ 250 F (121°C)
1 hour @ 300 F (149°C)
3 hours @ 350 F (177°C)

Install thermocouples to monitor the mold temperature throughout the post cure process.

HEATING AND COOLING RATES DURING POST CURE

Always allow tools made with ADTECH high temp systems to gel at room temperature before subjecting them to post cure (24 hours is usually sufficient). This will prevent excessive exotherm and shrink stress from occurring.
When oven curing laminated molds, always place the mold in a room temperature oven. Increase oven temperature at a rate of no more than 50°F (30°C) per hour. When heat cure is completed, turn off oven and allow molds to remain in the oven. Never remove mold from oven until mold temperature has been lowered to less than100°F (38°C).

QUALIFICATIONS

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

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