

TECHNICAL DATA SHEET

EL-315 with **EL-315-1**, **EL-315-IHL**, or **EL-315-2** Hardeners

HIGH TEMPERATURE, HIGH PERFORMANCE EPOXY LAMINATING SYSTEM VARIABLE HARDENERS

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.

APPLICATIONS

- *Oven cured processing*
- *Composite parts*
- *Autoclave Tooling*
- *Heated RTM Molds*
- *Bonding Jigs*
- *Suitable for vacuum-bagging*

PROPERTIES

- *Good wet-out*
- *Post-curing options*
- *Three hardener choices*
- *Excellent bond to all fabrics*
- *Up to 450F (232C) Tg with 315-2*
- *Self-supporting after 150F cure*

Physical Properties – Handling

Property	Units	EL-315 Resin	EL-315-1 Hardener	EL-315 IHL Hardener	EL-315-2 Hardener
Composition		Epoxy	Amine	Amine	Amine
Mix Ratio, by weight		100	25	19	24
Appearance		Clear Liquid	Liquid	Liquid	Liquid
Color		Light Amber	Black	Amber	Amber
Color - Mixed			Black	Amber	Amber
Viscosity, mixed @ 77°F (25°C) Cps & mPa.s	Brookfield LVT		2,500 - 4,000	2,000 – 3,000	4,000 – 5,000
Density, mixed @ 77°F (25°C) lbs./gal. (g/cc)	ASTM D 1480		9.85 (1.18)	9.10 (1.09)	9.51 (1.14)
Work time @ 77°F (25°C)	Minutes		50 - 75	50 - 60	180 - 210

Neat Cured Properties Unless Noted* Tested at 74°F (23°C)

	Test Method	Unit(s)	With EL-315-1 Hardener	With EL-315 IHL Hardener	With EL-319-2 Hardener
Glass Transition Temperature (Tg) DMA	ASTM D4065	°F (°C)	331 (166)	305 (152)	450 (232)
Hardness	ASTM D2240	Shore D	88	90	90
Tensile Elongation	ASTM D638	%	1.8	1.7	Not Tested
Notched Izod Strength	ASTM D648	in-lbs/in	4.5	6.47	4.5
*Flexural Strength	ASTM D790	psi (MPa)	44,540 (307)	90,480 (624)	76,200 (525)
*Flexural Modulus	ASTM D790	psi (MPa)	2,296,000 (15,830)	4,642,000 (32,005)	3,504,000 (24,159)
*Tensile Strength	ASTM D638	psi (MPa)	33,690 (232)	62,630 (432)	56,090 (387)
*Tensile Modulus	ASTM D638	psi (MPa)	2,593,000 (17,878)	4,048, 000 (27,910)	3,504,000 (24,159)

All testing samples Cured - 24 hours @ 77°F (25°C) + 2 hour @ 200 F (93°C) + 2 hour @ 250 F (121°C) + 2 hour @ 300 F (149°C) + 3 hour @ 350 F (177°C).

* Denotes Physical Testing conducted on 6 ply – 7500 Style E-Glass Laminate. All other testing conducted on neat samples

PROCESSING

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:

- 2 hour @ 200 F (93°C)
- +2 hour @ 250 F (121°C)
- +2 hour @ 300 F (149°C)
- +3 hour @ 350 F (177°C)

HEATING AND COOLING RATES DURING POST CURE - Always allow tools made with 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 than 100°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

HANDLING PRECAUTIONS

Normal health and safety precautions should be observed when handling these products :

- Ensure good ventilation.
- Wear gloves, glasses and protective clothes.

For further information, please consult the Safety Data Sheets.

STORAGE CONDITIONS

- Product shelf life of resin and hardener is 24 months when stored in original unopened containers between 65 – 77°F (15 – 25°C). Any opened can must be tightly closed. Any opened can must be tightly closed.

PACKAGING

Packaging information on request, please contact your local sales representative or find your local contact on www.sikaadvancedresins.us

LEGAL NOTICE

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