



EL-319

EL-319 or EL 319-1 Hardeners Technical Data Sheet FLAME RETARDANT LAMINATING SYSTEM Meets FAR 25.853 Flame Testing

DESCRIPTION

EL-319 with EL-319 or EL-319 hardeners is a UV stabilized Halogen-Free Flame Retardant Epoxy Laminating System developed for use in fabricating parts or repairs on structures which require flame retardant, self-extinguishing properties with room-temperature curing capabilities (or post cure option). EL-319 resin is available with two hardener choices: EL-319 moderate work-life hardener for fast turnaround of production parts and repairs, or EL-319-1 long work-life hardener for laminating and vacuum bagging of large parts and repairs.

APPLICATIONS

- *Aerospace and transportation flame retardant composite parts*
- *Suitable for vacuum bagging or RTM*

PROPERTIES

- *Low viscosity for good wet-out*
- *Non-Halogen flame retardancy*
- *Self-extinguishing*
- *Two hardener choices (fast/slow)*
- *RoHS and REACH SVHC compliant*
- *Epoxy (non-styrene)*
- *Excellent bond to all fabrics*

PHYSICAL PROPERTIES				
	Units	EL-319	EL-319 Hardener	EL-319-1 Hardener
Composition		Epoxy	Amine	Amine
Mix ratio – by weight		100	12	19
Aspect		Clear Liquid	Clear Liquid	Clear Liquid
Color	Visual	Light Amber	Light Amber	Light Amber
Viscosity – Brookfield	Cps.	9,720	40	30
Viscosity – Brookfield (mixed)	Cps.		1,865	1,105
Density at 77°F (25°C) (mixed)	lbs./gal (g/cc)	9.78 (1.17)	8.10 (.97)	7.94 (.95)
Pot life (200g) at 77°F (25°C)	minutes		50	139

PROCESSING CONDITIONS

- *Thoroughly blend correct parts resin with hardener by weight for 1 to 1 ½ minutes in a clean dry container.*
- *Carefully scrape the surfaces while blending to ensure complete mixing and uniformity.*

Please note:

EL-319 resin may separate in storage, please mix thoroughly before use.

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Technical Data Sheet

FLAME RETARDANT LAMINATING SYSTEM

Meets FAR 25.853 Flame Testing

MECHANICAL AND THERMAL PROPERTIES (NEAT FORM)

Property	Test Method	Units(s)	With EL-319 H*	With EL-319 H**	With EL-319-1 H*	With EL-319-1 H**
Hardness	ASTM D2240	Shore D	87	88	87	87
Flexural strength	ASTM D790	psi (MPa)	13,040 (90)	14,593 (101)	11,535 (80)	17,006 (117)
Flexural modulus	ASTM D790	psi (MPa)	473,215 (3,265)	560,077 (3,864)	372,726 (2,572)	527,632 (3,641)
Tensile strength	ASTM D638	psi (MPa)	7,510 (52)	9,799 (68)	7,067 (49)	10,424 (72)
Tensile modulus	ASTM D638	psi (MPa)	341,734 (2,358)	349,476 (2,411)	250,994 (1,732)	309,786 (2,136)
Elongation	ASTM D638	%	2.6	3.3	4.0	4.4
Tg (TMA)	ASTM E1545	°F (°C)	113 (45)	170 (77)	98 (38)	115 (45)

*Cure schedule: *7 day at 77°F (25°C) **24-36 hr at 77°F (25°C) + 4 hr 212°F (100°C)

MECHANICAL PROPERTIES (COMPOSITE FORM)

Property	Test Method	Units(s)	With EL-319 H*	With EL-319 H**	With EL-319-1 H*	With EL-319-1 H**
Flexural strength	ASTM D790	psi (MPa)	39,579 (273)	41,307 (285)	27,024 (187)	34,013 (235)
Flexural modulus	ASTM D790	psi (MPa)	2,045,866 (14,116)	2,104,875 (14,524)	1,668,446 (11,512)	1,972,914 (13,613)
Tensile strength	ASTM D638	psi (MPa)	38,806 (268)	33,984 (234)	36,765 (253)	35,347 (244)
Tensile modulus	ASTM D638	psi (MPa)	893,147 (6,163)	948,429 (6,544)	806,877 (5,567)	877,612 (6,056)
Elongation	ASTM D638	%	6.6	5.4	7.2	6.2

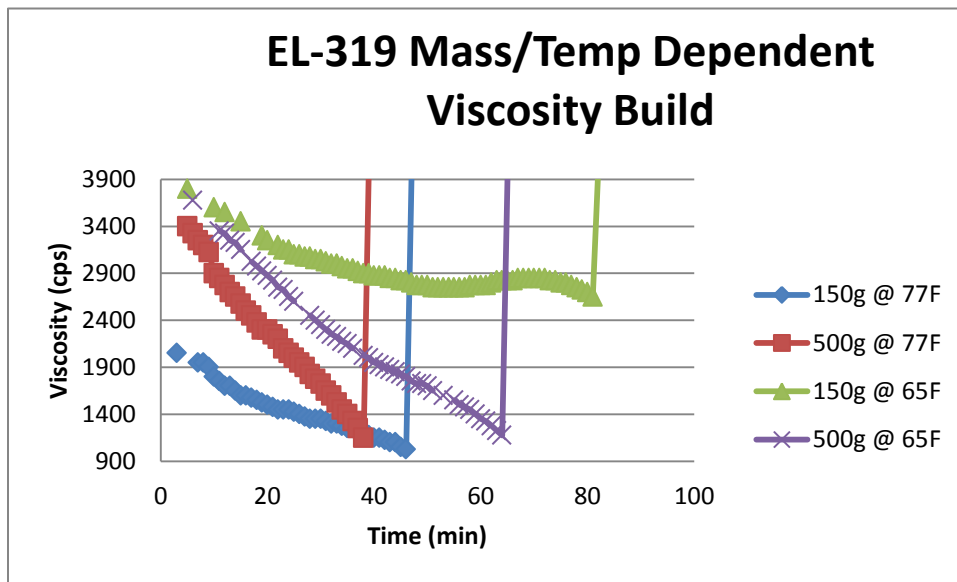
*Cure schedule: *7 day at 77°F (25°C) **24-36 hr at 77°F (25°C) + 4 hr 212°F (100°C)

Composite layup – 8 layers, Volan A 7500 10 oz. glass cloth, 0-90°rotation, Vacuum bagged.
Resin content was 38.8% (by wt.) for EL-319R/EL-319 H and 33.5% for EL-319R/EL-319-1 H laminates.

Flame Retardant Properties**		
Test Description	Test Method	Test Results
(F1) 60 second – Vertical Burn Test	FAR/JAR 25.853	Pass
(F2) 12 second- Vertical Burn Test Req.	FAR/JAR 25.853	Pass
(F5) 30 second-45°Angle Burn Test	FAR/JAR 25.853	Pass

** **FAR/JAR 25.853 Appendix F, Part I(a)(1)(i), (ii), (v) (4 ply 7500 Style E-Glass Laminate)**, Cure schedule: 7 days/77°F (25°C). Testing done at third party laboratory.

This graph shows the relationship between starting temperature, mass, and gel time as a guide for project planning for EL-319 Resin with EL-319 Hardener.



STORAGE CONDITIONS

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

HANDLING PRECAUTIONS

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

- Ensure good ventilation
- Wear gloves, and safety glasses.

For further information, please consult the Safety Data Sheet (SDS).

DISCLAIMER

The information contained in this technical data sheet results from research and tests conducted in our laboratories under precise conditions. Seller cannot anticipate all conditions under which seller's products, or the products of other manufacturers in combination with seller's products, may be used. It is the responsibility of the user to determine the suitability of the SikaAxson's products, under their own conditions, before commencing with the proposed application. In no event shall SikaAxson US be liable for any direct, indirect, punitive, incidental, special, and/or consequential damages, to property or life, whatsoever arising out of or connected with the use or misuse of our products.