



MARINE 820

Marine 822, 823, 824 Hardeners

Technical Data Sheet

EPOXY LAMINATING SYSTEM

For laminating or infusion, UV-Resistant

DESCRIPTION

The Marine 820 Epoxy Laminating Systems are 100% solids systems developed for the fabrication and repair of high performance composite structures. The Marine 820 Epoxy Laminating Systems consist of one resin and a selection of three separate hardeners to suit your building or repair needs. The resin and hardener combinations produce low viscosity mixtures with convenient volumetric mix ratios. In addition, the Marine 820 Epoxy Laminating Systems are specially formulated for standard wet lay-up or resin-infusion operations requiring the highest degree of fabric wetting and air release attributes. The systems are specifically engineered to promote a high fiber-to-resin ratio and a greater interface with composite fabric(s), thereby resulting in lighter, stronger parts offering lower maintenance and long-term performance

APPLICATIONS

- High performance marine boats, parts, and tooling applications
- Suitable for wet layup, vacuum-bagging, infusion

PROPERTIES

- Low viscosity for excellent wet-out
- Three hardener choices (fast/medium/slow)
- UV resistant
- Above or below waterline applications
- RoHS and REACH compliant
- Epoxy (non-styrene)
- Excellent bond to all fabrics
- Suitable for aramid fiber laminates

Physical Properties					
	Test Method	Marine 820 Resin	Marine 822 Hardener	Marine 823 Hardener	Marine 824 Hardener
Composition		Epoxy	Amine	Amine	Amine
Mix Ratio, by weight		100	18	18	18
Appearance		Clear Liquid	Clear Liquid	Clear Liquid	Clear Liquid
Color		Light Amber	Light Amber	Light Amber	Light Amber
Viscosity @ 77°F (25°C) Cps.and mPa.s	Brookfield LVT	1,275	115	41	47
Density @ 77°F (25°C) lbs./gal. (g/cc)	ASTM D 1480	9.23 (1.11)	8.34 (1.00)	8.10 (.97)	8.10 (.97)
Viscosity, mixed @ 77°F (25°C) Cps.and mPa.s	Brookfield LVT		633	390	410
Gel time, 235 g at 77°F (25°C)	Minutes		34	43	52



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Neat Cured Properties tested at 74°F (23°C) *R.T. and **Heat Cured

	Test Method	Unit(s)	With Marine 822 Hardener	With Marine 823 Hardener	With Marine 824 Hardener
Glass Transition Temperature (Tg) * R.T. Cure **212°F Post-Cure	ASTM E1545	°F (°C)	123 (51.1) 154 (67.8)	140 (60.3) 163 (72.7)	137 (58.2) 159 (70.5)
Hardness * R.T. Cure **212°F Post-Cure	ASTM D-2240	Shore D	85 85	84 85	84 86
Flexural Strength * R.T. Cure **212°F Post-Cure	ASTM D790	psi (MPa)	10,116 (70) 16,420 (113)	10,481 (72) 14,917 (103)	10,824 (75) 13,899 (96)
Flexural Modulus * R.T. Cure **212°F Post-Cure	ASTM D790	psi (MPa)	423,317 (2921) 445,545 (3074)	381,130 (2630) 408,682 (2820)	396,965 (2739) 409,770 (2827)
Tensile Strength * R.T. Cure **212°F Post-Cure	ASTM D638	psi (MPa)	6,365 (44) 8,992 (62)	7,370 (51) 10,239 (71)	6,576 (45) 10,695 (74)
Tensile Modulus * R.T. Cure **212°F Post-Cure	ASTM D638	psi (MPa)	268,187 (1851) 271,239 (1872)	272,702 (1882) 259,791 (1793)	263,910 (1821) 271,214 (1871)
Tensile Elongation * R.T. Cure **212°F Post-Cure	ASTM-D638	%	2.7 4.0	3.2 6.3	3.0 6.1
Moisture Absorption * R.T. Cure	ASTM D-570	%	.17	.21	.25

*Cured-7 days at 77°F (25°C) **Cured 4 hours at 212°F (100°C)
Results are average values on laboratory prepared test samples

SikaAxson US
+1 248 588 2270
axsonmh@axson.com
sikaaxson.us

CHINA
+86 21 58 68 30 37
marketing.china@axson.com
MEXICO
+52 55 52 64 49 22
marketing@axson.com.mx

FRANCE
+33 1 34 40 34 60
axson@axson.com
SLOVAKIA
+42 1 76 42 25 26
axson.sk@axson.com

INDIA
+91 20 25 56 07 10-11
info.india@axson.com
SPAIN
+34 9 32 25 16 20
spain@axson.com

ITALY
+39 02 96 70 23 36
axson@axson.it
U.K.
+44 16 38 66 00 62
sales.uk@axson.com

JAPAN
+81 5 64 26 25 91
sales.japan@axson.com

SIKA GERMANY – SikaAxson
+49 7125 940 492
tooling@de.sika.com
www.sikaaxson.de



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Composite Cured Properties tested at 74°F (23°C)*					
Room Temperature Cured**					
	Test Method	Unit(s)	With Marine 822 Hardener	With Marine 823 Hardener	With Marine 824 Hardener
Flexural Strength	ASTM D790	psi (MPa)	35,175 (243)	35,657 (246)	32,925 (227)
Flexural Modulus	ASTM D790	psi (MPa)	1,928,040 (13,303)	1,666,393 (11,498)	1,614,814 (11,142)
Tensile Strength	ASTM D638	psi (MPa)	41,189 (284)	36,221 (250)	33,391 (230)
Tensile Modulus	ASTM D638	psi (MPa)	975,092 (6,728)	815,364 (5,626)	674,313 (4,653)
Tensile Elongation	ASTM D638	%	6.6	7.0	6.7

*Average values on laboratory prepared test samples, **Cured 7 days at 77°F (25°C)

Composite layup – 8 layers, Volan A 7500 10 oz. glass cloth, Plain weave, 0-90°rotation, Vacuum bagged. Resin laminate content was 37% (by wt.) for Marine 820/822 H, 40% for Marine 820/823 H, 34% for Marine 820/824 H.

Composite Cured Properties tested at 74°F (23°C)*					
Heat Cured**					
	Test Method	Unit(s)	With Marine 822 Hardener	With Marine 823 Hardener	With Marine 824 Hardener
Flexural Strength	ASTM D790	psi (MPa)	40,591 (280)	37,404 (258)	36,632 (253)
Flexural Modulus	ASTM D790	psi (MPa)	2,039,905 (14,075)	1,614,814 (11,142)	1,772,562 (12,231)
Tensile Strength	ASTM D638	psi (MPa)	36,387 (251)	32,325 (223)	31,126 (215)
Tensile Modulus	ASTM D638	psi (MPa)	905,866 (6,250)	833,849 (5,754)	851,211 (5,873)
Tensile Elongation	ASTM D638	%	5.9	6.0	5.4

*Average values on laboratory prepared test samples, **Cured 16 – 24 hrs at 77°F (25°C) + 4 Hours @ 212°F (100°C)

Composite layup – 8 layers, Volan A 7500 10 oz. glass cloth, Plain Weave, 0-90°rotation, Vacuum bagged. Resin laminate content was 37% (by wt.) for Marine 820/822 H, 40% for Marine 820/823 H, 34% for Marine 820/824 H

PROCESSING

After mixing according to the indicated ratio impregnate the reinforcement according to the selected process.

SikaAxson US +1 248 588 2270 axsonmh@axson.com sikaaxson.us	CHINA +86 21 58 68 30 37 marketing.china@axson.com MEXICO +52 55 52 64 49 22 marketing@axson.com.mx	FRANCE +33 1 34 40 34 60 axson@axson.com SLOVAKIA +42 1 76 42 25 26 axson.sk@axson.com	INDIA +91 20 25 56 07 10-11 info.india@axson.com SPAIN +34 9 32 25 16 20 spain@axson.com	ITALY +39 02 96 70 23 36 axson@axson.it U.K. +44 16 38 66 00 62 sales.uk@axson.com	JAPAN +81 5 64 26 25 91 sales.japan@axson.com	SIKA GERMANY – SikaAxson +49 7125 940 492 tooling@de.sika.com www.sikaaxson.de
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Accelerated cure schedule: The laminate can be immediately placed into up to 150°F (66°C) oven for three hours.
Normal cure schedule: Allow to set 24 hours at room temperature, then post cure up to 200°F if needed.

STORAGE CONDITIONS

This product has a shelf life of 12 months as indicated by the expiration date on the container when stored in original unopened containers between 59 – 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 additional 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.

SikaAxson US +1 248 588 2270 axsonmh@axson.com sikaaxson.us	CHINA +86 21 58 68 30 37 marketing.china@axson.com MEXICO +52 55 52 64 49 22 marketing@axson.com.mx	FRANCE +33 1 34 40 34 60 axson@axson.com SLOVAKIA +42 1 76 42 25 26 axson.sk@axson.com	INDIA +91 20 25 56 07 10-11 info.india@axson.com SPAIN +34 9 32 25 16 20 spain@axson.com	ITALY +39 02 96 70 23 36 axson@axson.it U.K. +44 16 38 66 00 62 sales.uk@axson.com	JAPAN +81 5 64 26 25 91 sales.japan@axson.com SIKA GERMANY – SikaAxson +49 7125 940 492 tooling@de.sika.com www.sikaaxson.de
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