

Starting Formulation

SF 8014

Hand Lay-up FRP Matrix

EPON™ Resin 862 / HELOXY™ Modifier 68 / EPIKURE™ Curing Agent 3234

Introduction This hand lay-up system allows for high filler loading due to its low viscosity. This capability allows this system to be used both as a laminating resin and as an adhesive system.

- Suggested Uses**
- Pipe fittings, flanges, man-ways, etc.
 - General aviation parts
 - General adhesive applications

- Features**
- Low viscosity
 - Initial room temperature cure
 - Post-cure recommended for optimum performance
 - Excellent balance of physical and thermal properties

- Chemical Description**
- EPIKOTE Resin 862 is a bisphenol F epoxy resin
 - HELOXY Modifier 68 is a difunctional reactive diluent
 - EPIKURE Curing Agent 3234 is a aliphatic amine

Formula	Material	Supplier	Pounds	Gallons
	EPON Resin 862	Hexion	90	9.1
	HELOXY Modifier 68	Hexion	10	1.1
	EPIKURE Curing Agent 3234	Hexion	<u>16</u>	<u>2.0</u>
		Total	116.0	12.2

Mixing Instructions EPON Resin 862 and HELOXY Modifier 68 may be blended in any ratio in order to adjust the processing and performance. The 90/10 blending ratio by weight was selected to provide a balance of processability and performance. Both components are low in viscosity and may easily be blended at room temperature. Once the resin and the modifier have been blended, then the curing agent should be added. Keep in mind that the gel time of EPIKURE Curing Agent 3234 blended with this resin blend in a 100 gram mass is only 27 minutes. Please plan accordingly.

For adhesive applications, the addition and thorough mixing of fillers, thixotropic agents, etc. into the resin blend should be completed prior to the addition of the curing agent.

Composite Fabrication / Hand Lay-up The initial cure step should be carried out at room temperature. An elevated temperature post cure may not be necessary depending on the requirements of the desired application. However, an elevated temperature post cure is recommended for optimum performance. Four hours at 82 °C (180 °F) was utilized to allow the use of low temperature tooling. The post-cure may be performed freestanding depending on the part geometry and tolerance required.

Typical Handling Properties Table 1 / Handling Properties

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	<u>Units</u>	<u>Value</u>
EPON Resin 862	pbw	90
HELOXY Modifier 68	pbw	10
EPIKURE Curing Agent 3234	pbw	16
Viscosity at 25 °C ¹	cP	460
Gel time ²	min.	27

¹ BrookfieldDV-11, Spindle 31.

² Shyodu Gel Timer, paper cup.

Typical Cured State Properties Table 2 / Properties of Cast Matrix System ¹

	<u>Method</u>	<u>Units</u>	<u>Value</u>
Tg DSC, dry ²	D-3418	°C (°F)	107 (225)
Tg DSC, wet ³		°C (°F)	96 (205)
Tg DMA ⁴	D-4065	°C (°F)	105 (221)
HDT (264 psi)	D-648	°C (°F)	93 (200)
Tensile strength, Ultimate	D-638	psi	10800
Tensile modulus		ksi	442
Tensile elongation at break		%	9.0
Flexural strength, Ultimate	D-790	psi	17800
Flexural modulus		ksi	471
Flexural elongation		%	5.8

¹ Cure Schedule: 12 hours at 25 °C (77 °F), 4 hours at 82 °C (180 °F).

² Glass Transition Temperature; Differential Scanning Calorimetry, 20 °C/minute.

³ Wet conditioning: 7 days immersed in deionized water at 63 °C (145 °F).

⁴ Glass Transition Temperature; Dynamic Mechanical Analysis, 1 °C/minute.

Storage Recommendations regarding storage conditions can be obtained by visiting our web site at www.hexion.com

General Information

These are starting formulations and are not proven in the user's particular application but are simply meant to demonstrate the efficacy of the products and to assist in the development of the user's own formulation. It is the user's responsibility to fully-test and qualify the formulation, along with the ingredients, methods, applications or equipment identified herein ("Information"), by the user's knowledgeable formulator or scientist, and to determine the appropriate use conditions and legal restrictions, prior to use of any Information.

Safety, Storage & Handling

Please refer to the MSDS for the most current Safety and Handling information.

Exposure to these materials should be minimized and avoided, if feasible, through the observance of proper precautions, use of appropriate engineering controls and proper personal protective clothing and equipment, and adherence to proper handling procedures. None of these materials should be used, stored, or transported until the handling precautions and recommendations as stated in the Material Safety Data Sheet (MSDS) for these and all other products being used are understood by all persons who will work with them. Questions and requests for

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