

Starting Formulation

SF 8003

Low Pressure Prepreg Laminating Compound EPON™ Resin SU-3

Introduction This laminating compound is designed for the preparation of glass cloth pre-preg possessing a drapable, tacky consistency capable of low pressure fabrication into high strength laminates complying with the performance requirements of MIL-R-9300, Type I. Utility of this compound also extends to use on high performance graphite and boron fibers.

Formula	<u>Material</u>	<u>Supplier</u>	<u>Pounds</u>	<u>Gallons</u>
Formulation				
	EPON Resin SU-3	Hexion	100.0	10.00
	Acetone	Shell Chemical Co.	41.0	6.21
	Boron trifluoride monoethylamine	Harshaw Chemical Co.	<u>3.0</u>	<u>0.25</u>
	Total Formulation		144.0	16.46

Mixing Instructions The formulation as presented requires the separate preparation of acetone solutions of EPON Resin SU-3 and boron trifluoride monoethylamine. Both solutions are best prepared in a closed tank equipped with agitator, heating capability, and water cooled condenser.

Dissolve the BF3MEA into an equal weight of acetone by agitation and gentle warming (<150 °F). Cool this solution to 125 °F or below.

Prepare a solution of EPON Resin SU-3 and the remaining acetone using agitation and moderate heating. When a clear, homogeneous solution is obtained, cool to 125 °F and add the BF3MEA/acetone solution. Agitate while cooling until homogeneous.

Typical Formulation Table 1 / Properties of Laminating Solution
Properties

	<u>Units</u>	<u>Value</u>
Viscosity at 25°C	cP	110
Denisty	lbs/gal	8.75
Gel time, stroke cure at 250°F	sec	390

Impregnation and B- Staging Impregnation of fiberglass cloth is easily accomplished with this low viscosity laminating solution using conventional wetting and squeeze-off equipment.

While optimum conditions for pre-preg production must be established for each manufacturing line, a B-stage schedule of 10 minutes at 200°F has been found to produce drapable, slightly tacky pre-pregs. When stored between protective release film at 77°F, this pre-preg should retain its initial drape and tack for greater than one month.

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Press Conditions and Style 7781, S-920 finish prepreg stock prepared as described above was fabricated into a Laminate Properties 12 ply laminate using the following press and post cure conditions:

Platen Temperature – 250°F
Contact Period – None
Pressure – 30 psi
Time in Press – 1 hr. at 350°F

The properties shown in Table 2 were determined in comparison to respective provisions of MIL-R-9300, Type I requirements.

Properties vs. Table 2 / Laminate Properties in Comparison to MIL-R-9300, Type I Requirements Requirements

Laminate	Specification Limit	Test Value
Resin Content, by wt.	–	26%
Flexural Strength, psi		
at 77 °F	70,000 min.	90,000
at 160 °F	65,000 min.	78,000
at 300 °F	–	49,000
Flexural Modulus, 10 ⁶ psi		
at 77 °F	3.2 min.	4.0
at 160 °F	3.2 min.	3.8
at 300 °F	–	3.2

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 information on Hexion Inc. ("Hexion") products should be directed to your Hexion sales representative, or the nearest Hexion sales office. Information and MSDSs on non-Hexion products should be obtained from the respective manufacturer.

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