

Starting Formulation

SF 8004

Prepreg Matrix for High-Temperature Composites EPON™ Resin SU-3 and SU-8

Introduction This epoxy binder system is designed for prepreg tape, sheet, or chopped roving stock utilizing graphite, boron or glass fiber reinforcement for applications requiring long term performance at temperatures as high as 350 °F. Composites fabricated by vacuum bag techniques and cured at a maximum temperature of 350 °F exhibit high interlaminar shear strength and flexural strength when tested at 350 °F.

Formula	<u>Material</u>	<u>Supplier</u>	<u>Pounds</u>	<u>Gallons</u>
Formulation				
	EPON Resin SU-3	Hexion	75.0	7.58
	EPON Resin SU-8	Hexion	25.0	2.53
	4, 4'-Diaminodiphenylsulfone	Miller-Stephenson Chemical Co.	32.8	2.95
	Acetone	Shell Chemical Co.	<u>25.0</u>	<u>3.79</u>
	Total Formulation		157.8	16.85

Blending and Impregnation Melt blend the EPON Resin SU-8 and the EPON Resin SU-3 by heating with agitation. Add the diaminodiphenylsulfone curing agent and heat to 260 °F with moderate agitation. Hold temperature at 260-270 °F until a clear, homogeneous solution is obtained. Add acetone while cooling, to thin to a viscosity suitable for rapid wetting and impregnation of fiber reinforcements at room temperature. Heating of guide rollers and squeeze rollers facilitates maximum impregnation.

"B" - Staging The impregnated fiber may be "B"-staged to a tacky, drapable consistency by heating for a period of approximately 3 minutes in a forced draft oven or drying tower at a temperature of 200 °F. Prepreg tape and sheet stock should be sandwiched between release film for storage. The tack retention life of the prepreg should be approximately 8 days when stored at 77 °F. A longer or higher temperature "B"-stage operation will yield a dry prepreg suitable for chopped roving molding compounds.

Curing Conditions The cure conditions listed below were employed to cure a 15 ply, unidirectional graphite composite fabricated from Morganite II fiber:

Contact Period : None
 Platen Temperature : 275 °F
 Pressure : Pressed to 1/8" Stops
 Time in Press : 2 Hours
 Post Cure : 6 Hours at 350 °F

Properties of Graphite Properties obtained from a 15 ply Morganite II composite prepared in this manner

Composite described above are contained in Table 1.

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Compression Properties Table 1 / Properties of Compression Molded Morganite II Bars ¹

	<u>Units</u>	<u>Value</u>
Fiber Content, % by volume		51
Void Content, % by volume		1.3
Flexural Strength		
at 77 °F	psi ²	164
at 350 °F	psi ²	103
Short Beam Shear Strength	psi ³	
at 77 °F	psi ³	11,900
at 350 °F	psi ³	6,700
Flammability Rating ⁴		Self-Extinguishing

¹ 15 ply unidirectional composite prepared from heat treated Morganite II Tow.

² Tested using 16:1 span to depth ratio.

³ Tested using 5:1 span to depth ratio. All specimens failed in tension rather than shear.

⁴ Tested according to ASTM D-635.

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

General Information

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Safety, Storage & Handling

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

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For product prices, availability, or order placement, please contact customer service:

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For literature and technical assistance, visit our website at www.hexion.com

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