

# Starting Formulation

## SF 7019

### Thermal Shock Resistant Encapsulation Compound EPON™ Resin 828 / HELOXY™ Modifier 505

**Introduction** This medium viscosity, long pot life, filled encapsulating formulation is designed for components requiring good thermal shock resistance.

- Features**
- Medium Viscosity
  - Good thermal shock resistance
  - Long pot life

Formula	<u>Material</u>	<u>Supplier</u>	<u>Pounds</u>	<u>Gallons</u>
Resin Portion				
	EPON Resin 828	Hexion	13.1	1.35
	HELOXY Modifier 505	Hexion	19.6	2.32
	Super White Silica	C.K. Williams Co.	65.6	3.01
	Cab-O-Sil M-5	Cabot Corp.	<u>1.7</u>	<u>0.098</u>
		<b>Total</b>	<b>100.0</b>	<b>6.778</b>
Converter Portion				
	Hexahydrophthalic Anhydride	Milliken Chemical Co.	15.69	1.59
	Diethylaminoethanol	Pennwalt Corp.	<u>0.16</u>	<u>0.021</u>
		<b>Total</b>	<b>15.85</b>	<b>1.611</b>

**Compounding Procedure** Blend the epoxy resins. Add the silica and Cab-O-Sil, and disperse well with high agitation. The Cab-O-Sil prevents settling of the filler during early stages of the elevated temperature cure.

Melt the hexahydrophthalic anhydride and blend while still warm with the resin portion. Add the diethylaminoethanol accelerator, mix thoroughly, and remove air under vacuum for best results.

**Typical Handling Properties** Table 1 / Handling Properties

	<u>Units</u>	<u>Value</u>
Viscosity at 25 °C	cP	43,000
Pot Life at 25 °C, closed container	days	7
Density	lbs/gal	13.8

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Application Components to be encapsulated should be thoroughly cleaned and dried. For best results, evacuate the component under vacuum during the encapsulation process.

Typical Cured State Properties Table 2 / Cured State Properties<sup>1</sup>

	<u>Units</u>	<u>Value</u>
Tensile Strength, Ultimate	psi	2,730
Tensile Modulus, Initial	ksi	40
Tensile Elongation at Break	%	33
Flexural Strength	psi	1,100
Flexural Deflection	inch	>0.6
Flexural Modulus, Initial	ksi	15
Water Absorption, 24 hours at 25 °C	%	0.12
Weight Loss, 24 hours at 149 °C	%	0.50
Thermal Shock Resistance		
1/4-inch Olyphant Test <sup>2</sup>		passed
1/4-inch Olyphant Test <sup>3</sup>		failed
Hex Bar Test <sup>3</sup>		passed
Electrical Properties		
Dielectric Constant		
1 megacycle at 25 °C		4.2
Dissipation Factor		
1 megacycle at 25 °C		0.014
Volume Resistivity		
at 25 °C	ohm•cm	1.3 x 10 <sup>14</sup>
at 66 °C	ohm•cm	1.7 x 10 <sup>11</sup>
at 93 °C	ohm•cm	1.3 x 10 <sup>10</sup>
at 130 °C	ohm•cm	<10 <sup>9</sup>

<sup>1</sup> Cured 2 hours at 93 °C followed by 3 hours at 149 °C.

<sup>2</sup> Cured for 16 hours at 121 °C; 10 cycles, -55 °C to 130 °C.

<sup>3</sup> Cured 2 hours at 93 °C, followed by 3 hours at 149 °C; 10 cycles, -55 °C to 130 °C.

Storage Recommendations regarding storage conditions can be obtained by visiting our web site at [www.hexion.com](http://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.

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For literature and technical assistance, visit our website at [www.hexion.com](http://www.hexion.com)

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