



Formerly Dexter

Technical Data Sheet

# HYSOL<sup>®</sup>

## Electronic Formulated Liquid

---

### General Purpose Room Temperature Cure Epoxy Casting Systems

#### Diluted Epoxy Resin

RE2038 & HD3475 – Unfilled (R8-2038\*)  
EE4143 & HD3475 – Filled (C8-4143\*)

#### Undiluted Epoxy Systems

RE2039 & HD3475 – Unfilled (R9-2039\*)  
EE4183 & HD3475 – Filled (C9-4183\*)

### 1.0 DESCRIPTION

These systems have proven themselves with a 20-year service record on solenoid coils, transformers, resistors, connectors and hundreds of other applications.

#### 1.1 Diluted Epoxy Resin Systems

HYSOL<sup>®</sup> resin RE2038 with hardener HD3475 is a low viscosity, general casting system with excellent electrical and physical properties. It can be used whenever a rigid compound is needed and very low mixed viscosity is critical. HYSOL<sup>®</sup> casting compound EE4143 with hardener HD3475 is silica filled for improved thermal properties, lower shrinkage and lower expansion characteristics.

#### 1.2 Undiluted Epoxy Resin Systems

HYSOL<sup>®</sup> resin RE2039 with hardener HD3475 is an undiluted epoxy 100% solids system and should be used where very low mixed viscosity is not a critical requirement. The undiluted resin exhibits a higher heat distortion, lower moisture absorption, lower shrinkage and lower expansion characteristics than obtainable with a diluted resin. HYSOL<sup>®</sup> casting compound EE4183 with hardener HD3475 is silica filled for improved thermal properties, lower shrinkage and lower expansion characteristics. They are resistant to gasoline, jet fuel and other solvents.

#### 1.3 Colored versions exhibiting identical properties to the systems above are available as follows:

Unfilled: Amber-RE2038 (R8-2038\*), Black-EE4175 (C8-4175\*)  
Amber-RE2039 (R9-2039\*), Black-EE4210 (C9-4210\*)  
Filled: Tan-EE4143 (C8-4143\*), Red-EE4154 (C8-4154\*), Black-EE4179 (C8-4179\*),  
Tan-EE4183 (C9-4183\*), Red-EE4190 (C9-4190\*), Green-EE4198 (C9-4198\*),  
Blue-EE4207 (C9-4207\*), Black-EE4215 (C9-4215\*)

\*Formerly

## 2.0 SPECIFICATION OF PRODUCT

	RE2038†	EE4143†	RE2039	EE4183	HD3475	Test Method
Color, max.	Gardner 3		Gardner 4		Gardner 4	ASTM D 1544
Color		Tan		Tan		Visual
Filler Content, %		48-52		48-52		ASTM D 2584
Hydrogen equivalent (meg HClO <sub>4</sub> /gm)					25.3-29.3	Hysol 14A
Specific Gravity @ 25°C (77°F)	1.12-1.22	1.5-1.62	1.15-1.17	1.5-1.65	1.0-1.2	ASTMD1475
Viscosity @ 25°C (77°F)						ASTMD2393
Brookfield RVF						
Spindle 2, speed 20, cps	500-1300					
Spindle 5, speed 10, cps			10,000-16,000			
Spindle 5, speed 20, cps		15,000 max.				
Spindle 6, speed 4, cps				60,000-100,000		
Spindle 5, speed 4, cps					2,500-7,500	
Shelf Life @ 25°C (77°F), months (minimum from date of shipment)	12	6	12	6	12	

†May crystallize. See paragraph 4.0

NOTE: The resin base of these compounds meets the requirements of ASTM D 1763, specification for epoxy resins.

**3.0 TYPICAL CURED PROPERTIES** – Values are not intended for use in preparation of specifications. All measurements taken at 25°C (77°F) unless otherwise noted.

### 3.1 Cured Physical Characteristics

	RE2038 /HD3475	EE4143 /HD3475	RE2039 /HD3475	EE4183 /HD3475	Test Method
Color	Amber	Tan	Amber	Tan	Visual
Coefficient of Linear thermal Expansion in/in/°C					
25°-T <sub>g</sub> °C	85 x 10 <sup>-6</sup>	56 x 10 <sup>-6</sup>	72 x 10 <sup>-6</sup>	51 x 10 <sup>-6</sup>	ASTM D 3386
T <sub>g</sub> °-150°C	191 x 10 <sup>-6</sup>	128 x 10 <sup>-6</sup>	190 x 10 <sup>-6</sup>	167 x 10 <sup>-6</sup>	
Compressive Strength, psi	37,900	13,100	38,100	23,600	ASTM D 695
Density, gm/cc	1.17	1.53	1.18	1.52	ASTM D 792
Elongation, %	4.98	1.66	5.5	1.6	ASTM D 638
Filler content, %	0	44	0	45	ASTM D 2584
Flexural strength, psi	21,100	15,500	22,000	15,000	ASTM D 790
Glass Transition (T <sub>g</sub> ), °C	89	70	119	119	ASTM D 3386
Hardness, Shore D	85	88	85	90	ASTM D 2240
Heat deflection, temp. @ 264 psi, °C (F°)	80 (176)	80 (176)	113 (233)	89 (191)	ASTM D 648
Izod impact strength, Ft-lb/in of notch	0.25	0.34	0.25	0.30	ASTM D 256
Linear shrinkage, %	1.10	0.75	0.42	0.60	ASTM D 2566
Moisture absorption, % (24 hour immersion)	0.20	0.10	0.20	0.08	ASTM D 570
Tensile strength, psi	10,850	10,000	11,650	9,600	ASTM D 638

	<b>RE2038 /HD3475</b>	<b>EE4143 /HD3475</b>	<b>RE2039 /HD3475</b>	<b>EE4183 /HD3475</b>	<b>Test Method</b>
Thermal conductivity, Cal x cm/ (sec x cm <sup>2</sup> x °C)	5 x 10 <sup>-4</sup>	12 x 10 <sup>-4</sup>	5 x 10 <sup>-4</sup>	11 x 10 <sup>-4</sup>	ASTM D 1674
Guide to operating Class, IEEE °C (°F)	105 (221)	105 (221)	105 (221)	105 (221)	ASTM D 1674

### 3.2 Cured Electrical Properties

	<b>RE2038 /HD3475</b>	<b>EE4143 /HD3475</b>	<b>RE2039 /HD3475</b>	<b>EE4183 /HD3475</b>	<b>Test Method</b>
Dielectric strength @ 10 mil thickness, volts/mil	1,800	1,678	1,900	1,525	ASTM D 149
Arc resistance, seconds	105	146	100	176	ASTM D 495

	<b>RE2038/HD3475</b>		<b>EE4143/HD3475</b>		<b>RE2039/HD3475</b>		<b>EE4183/HD3475</b>									
	25°		105°		25°		105°									
	<b>K</b>	<b>D</b>	<b>K</b>	<b>D</b>	<b>K</b>	<b>D</b>	<b>K</b>	<b>D</b>								
100 Hz	3.9	.008	5.3	.057	4.4	.009	5.0	.02	4.5	.009	4.9	.005	4.5	.010	5.0	.022
1 kHz	4.1	.017	4.9	.023	4.1	.017	4.8	.022	4.2	.027	4.7	.006	4.3	.020	4.7	.010
100 kHz	3.5	.033	4.5	.027	4.1	.023	4.7	.016	4.0	.036	4.7	.018	4.1	.028	4.7	.017
Vol res.	7x10 <sup>16</sup>		6x10 <sup>12</sup>		7x10 <sup>15</sup>		1x10 <sup>14</sup>		1x10 <sup>17</sup>		5x10 <sup>14</sup>		8x10 <sup>15</sup>		3x10 <sup>14</sup>	

K = Dielectric constant by ASTM D 150

D = Dissipation factor by ASTM D 150

Vol res. = Volume resistivity in ohm-cm by ASTM D 257

### 4.0 HANDLING

	<b>RE2038/HD3475†</b>	<b>EE4143/HD3475†</b>	<b>RE2039/HD3475</b>	<b>EE4183/HD3475</b>
Mix ratio, parts by weight*	100/25	100/12.5	100/25	100/12.5
Mix ratio, parts by volume*	100/26	100/18	100/27	100/18.5
Pot life @ 25°C (77°F) (200 gram mass), minutes	25	30	25	30
Viscosity @ 25°C (77°F), cps	1,500	7,000	10,000	70,000
Peak exothermic temperature (200g mass), °C (°F)	200 (392)	150 (302)	200 (392)	150 (302)

\*Mix ratio of these materials is fixed by their chemistry. Any attempt to increase or decrease the cure rate by adding more or less hardener will result in degraded materials.

Filled resins may tend to settle during storage. Thorough mixing is required each time they are used.

†If crystals form in RE2038 or EE4143 on standing, redissolve by heating to 60°C (140°F) for 6 hours in one gallon mass; shorter time may be sufficient for smaller containers.

## 4.1 CURE SCHEDULE

Recommended cure – two hours at 60°C (140°F).

Alternate cure – twenty-four hours at room temperature. Some variation in listed values may occur; customer should determine whether cure other than recommended cure above will give satisfactory results.

06/2000

---

For additional information in the Americas, please contact one of the following locations:

**New York**

TEL: 716.372.6300

FAX: 716.372.6864

**Canada**

TEL: 905.814.6511

FAX: 905.814.5391

**Brazil**

TEL: 011.55.11.4143.7000

FAX: 011.55.11.4143.7100

For a complete listing of worldwide locations and information on related products, please visit our website [www.loctite.com/electronics](http://www.loctite.com/electronics)

---

**DISCLAIMER:** The information supplied in this document is for guidance only and should not be construed as a warranty. All implied warranties are expressly disclaimed. Including without limitation any warranty of merchantability and fitness for use: All users of the materials are responsible for assuring that it is suitable for their needs, environment and use. All data is subject to change as Loctite deems appropriate.

Users should review the Material Safety Data Sheet (MSDS) and product label for the material to determine possible health hazards, appropriate engineering controls and precautions to be observed in using the material. Copies of the MSDS and label are available upon request

---