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Technical Data Sheet

# HYSOL®

## Electronic Formulated Liquid

## 1.0 Description

Casting compounds Hysol® EE4183 or EE4186, when used with hardener HD3485, are low exotherm, long pot life casting systems. These systems show good shock resistance where low temperature operation is required. They are being widely used for massive castings – up to 400 pounds – where high electrical insulation properties must be maintained.

1.1 Colored versions exhibiting identical properties to Hysol® EE4183are available as follows:

| | |
|---|---|
| EE4190 – Red | EE4198 – Green |
| EE4207 – Blue | EE4215 - Black |

### 2.0 TYPICAL UNCURED PROPERTIES

| | EE4183 | EE4186 | HD3485 | TEST METHOD |
|---|---|---|---|---|
| Color, maximum | - | - | Gardner 4 | ASTM D 1544 |
| Color | Tan | Gray | - | Visual |
| Filler content, % | 48-52 | 63-67 | - | ASTM D 2584 |
| Specific Gravity @ 25°C (77°F) | 1.50-1.65 | 1.75-1.80 | 1.10-1.20 | ASTM D 1475 |
| Viscosity @ 25°C | | | | ASTM D 2393 |
| Brookfield RVF | | | | |
| Spindle 6, Speed 10 cps | 60-100,000 | 100-200,000 | | |
| Spindle 3, Speed 10 cps | | | 3-4,500 | |
| Shelf Life @ 25°C (77°F), months min. from date of shipment | 6 | 6 | 12 | |

**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. Contact your Dexter Electronic Materials representative for information regarding specification values.

### 3.1 Cured Physical Characteristics

| | EE4183 /HD3485 | EE4186 /HD3485 | TEST METHOD |
|---|---|---|---|
| Color | Tan | Tan | Visual |
| Coefficient of linear thermal expansion in/in/°C (30°C to 90°C), minimum | $78 \times 10^{-6}$ | $68 \times 10^{-6}$ | ASTM D 3386 |
| Compressive strength, psi | 22,000 | 22,000 | ASTM D 695 |
| Density, lb/cu in | 0.057 | 0.063 | ASTM D 792 |
| Elongation, % | 1.00 | 1.08 | ASTM D 638 |
| Filler Content, % | 48-52 | 63-67 | ASTM D 2584 |

| | EE4183 /HD3485 | EE4186 /HD3485 | TEST METHOD |
|---|---|---|---|
| Flexural strength, psi | 17,000 | 17,000 | ASTM D 790 |
| Hardness, Shore D, minimum | 85 | 87 | ASTM D 2240 |
| Heat deflection temperature @ 264 psi, °C (°F) | 80 (176) | 80 (176) | ASTM D 648 |
| Izod impact strength, ft-lb/in. of notch | 0.23 | 0.24 | ASTM D 256 |
| Linear shrinkage, % | 0.4-0.6 | 0.3-0.4 | ASTM D 2566 |
| Moisture absorption (24 hr immersion), % | 0.24 | 0.22 | ASTM D 570 |
| Specific gravity @ 25°C (77°F) | 1.53 | 1.77 | ASTM D 792 |
| Tensile strength, psi | 6,400 | 7,000 | ASTM D 638 |
| Thermal conductivity, Cal x cm/(sec x $cm^2$ x °C) | $12 \times 10^{-4}$ | $16 \times 10^{-4}$ | |
| Guide to operating class, IEEE °C, (°F) | 130 (266) | 130 (266) | |

**3.2 Cured Electrical Properties**

| | EE4183 /HD3485 | EE4186 /HD3485 | TEST METHOD |
|---|---|---|---|
| Dielectric strength @10 mil thickness, volts/mil | 1,400 | 1,350 | ASTM D 149 |
| Arc resistance, seconds | 138 | 163 | ASTM D 495 |

| | EE4183/HD3485 | | | | EE4186/HD3485 | | | |
|---|---|---|---|---|---|---|---|---|
| | 25°C | | 105°C | | 25°C | | 105°C | |
| | K | D | K | D | K | D | K | D |
| 100 Hz | 4.4 | .007 | 6.4 | .0324 | 4.4 | .007 | 6.4 | 0.351 |
| 100 kHz | 4.2 | .012 | 4.8 | .021 | 4.3 | .013 | 4.9 | 0.024 |
| Vol. Res. | $7 \times 10^{13}$ | | $1 \times 10^{11}$ | | $6 \times 10^{13}$ | | $2 \times 10^{10}$ | |

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 | EE4183/HD3485 | EE4186/HD3485 |
|---|---|---|
| Mix ratio, parts by weight* | 100/7 | 100/5 |
| Mix ratio, parts by volume* | 100/9 | 100/7.5 |
| Pot Life | | |
| @ 25°C (77°F) (200 gram mass), hours | 24 | 24 |
| @ 75°C (167°F) (200 gram mass), hours | 3 | 3 |
| Viscosity @ 25°C (77°F) | | |
| Spindle 1, Speed 10, cps | 500 | - |
| Spindle 4, Speed 20, cps | - | 7,000 |
| Gel Time @ 75°C (167°F), hours | 5 | 5 |

*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.

### 4.1 Mixing Instructions

Heat base to 50°C to 75°C (122°F to 167°F), add hardener, mix, deair and cast into preheated 75°C (167°F) mold. In small masses, it may be necessary to bring the temperature to 85°C (185°F) to get compatibility of base and hardener.

## CURE SCHEDULE

| | |
|---|---|
| Recommended cure | Six hours at 100°C (213°F) |
| Alternate cure | 16 hours at 75°C (167°F) |

Typical cured properties were determined using the recommended cure schedule. Some difference in properties may occur with the alternate or other cure schedules.

06/2000

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

| New York | Canada | Brazil |
|---|---|---|
| TEL: 716.372.6300 | TEL: 905.814.6511 | TEL: 011 55 11.4143 7000 |
| FAX: 716.372.6864 | FAX: 905.814.5391 | 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