



# BERGQUIST BOND PLY TBP 1400LMS-HD

Known as BOND-PLY LMS-HD BERGQUIST  
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## PRODUCT DESCRIPTION

Laminate Material - Silicone, High Durability, Optional Lamination Methods.

|                                    |                                                      |
|------------------------------------|------------------------------------------------------|
| <b>Technology</b>                  | Acrylic                                              |
| <b>Appearance</b>                  | Yellow                                               |
| <b>Reinforcement Carrier</b>       | Fiberglass                                           |
| <b>Total Thickness</b>             | 0.254 to 0.457 mm                                    |
| <b>Application</b>                 | Thermal management,<br>Thermally conductive adhesive |
| <b>Operating Temperature Range</b> | -60 to 180°C                                         |

## FEATURES AND BENEFITS

- TO-220 Thermal performance: 2.3°C/W, initial pressure only lamination
- Exceptional dielectric strength
- Very low interfacial resistance
- 200 psi adhesion strength
- Continuous use of -60 to 180°C
- Eliminates mechanical fasteners

## TYPICAL APPLICATIONS

- Discrete semi-conductor packages bonded to heat spreader or heat sink

BERGQUIST BOND PLY TBP 1400LMS-HD is a thermally conductive heat curable laminate material. The product consists of a high performance thermally conductive low modulus silicone compound coated on a cured core, and double lined with protective films.

The low modulus silicone design effectively absorbs mechanical stresses induced by assembly-level CTE mismatch, shock and vibration while providing exceptional thermal performance (vs PSA technologies) and long-term integrity.

BERGQUIST BOND PLY TBP 1400LMS-HD will typically be used for structurally adhering power components and PCBs to a heat sink

## SHELF LIFE

BERGQUIST BOND PLY TBP 1400LMS-HD is a heat-cured material and should be stored in temperature controlled conditions. The recommended storage temperature range of 5-25°C should be used to maintain optimum characteristics for a 5-month shelf life.

## TYPICAL CURE SCHEDULE

### Cure Schedule <sup>(5)</sup>

30 minutes @ 125°C, ASTM D4473

6 minutes @ 160°C, ASTM D4473

## TYPICAL PROPERTIES

### Physical Properties

Flammability Rating, UL 94 V-0

### Adhesion Properties

Lap Shear Strength, ASTM D1002:  
@ 25°C

|       |       |
|-------|-------|
| MPa   | 1.4   |
| (psi) | (200) |

### Electrical Properties

Dielectric Breakdown Voltage, Sheet, ASTM D149, 5,000 Vac <sup>(1)</sup>

Dielectric Breakdown Voltage, Laminated, ASTM D149, Vac <sup>(2)</sup> 4,000

Dielectric Constant, ASTM D150 @ 1,000 Hz 5.0

Volume Resistivity, ASTM D257, ohm-meter  $1 \times 10^{11}$

### Thermal Properties

Thermal Conductivity, ASTM D5470, W/(m-K) <sup>(3)</sup> 1.4

### Thermal Impedance vs. Lamination Pressure

Lamination Pressure, RD 2010 @ 75 psi <sup>(4)</sup>

TO-220 Thermal Performance, °C/W

|          |     |
|----------|-----|
| Constant | 2.1 |
| IPO      | 2.3 |

1) The ASTM D149 test method on cured LMS-HD material. No pressure was applied to the LMS-HD during the cure cycle.

2) A 1/2" diameter probe was laminated with LMS-HD to a 2" X 2" plate at 200 psi for 30 seconds, then cured with no pressure at 160°C for 6 minutes. The cured assembly was then tested per ASTM D149. This LMS-HD sample resembles a typical lamination application.

3) The ASTM D5470 (Bergquist Modified) test procedure was used on post-cured LMS-HD material. The recorded value includes interfacial thermal resistance. These values are given for customer reference only.

4) TO-220 Thermal Performance testing, per The Bergquist RD2010 specification for Laminates, was completed on laminated TO-220 assemblies. Lamination was completed at 75 psi for 30 seconds for "IPO" (Initial Pressure Only) and at a constant 75 psi during the lamination and curing process for "Constant". No additional pressure was applied during TO-220 thermal performance testing.

5) Cure Schedule – time after cure temperature is achieved at the interface. Ramp time is application dependent.

## GENERAL INFORMATION

For safe handling information on this product, consult the Safety Data Sheet, (SDS).



**Not for product specifications**

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

**CONFIGURATIONS AVAILABLE**

BERGQUIST BOND PLY TBP 1400LMS-HD are supplied in:

- Roll form
- Sheet form
- Die-Cut parts

**Conversions**

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
 $\text{kV/mm} \times 25.4 = \text{V/mil}$   
 $\text{mm} / 25.4 = \text{inches}$   
 $\text{N} \times 0.225 = \text{lb/F}$   
 $\text{N/mm} \times 5.71 = \text{lb/in}$   
 $\text{psi} \times 145 = \text{N/mm}^2$   
 $\text{MPa} = \text{N/mm}^2$   
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$   
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$   
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$   
 $\text{mPa}\cdot\text{s} = \text{cP}$

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Reference **N/A**