



# BERGQUIST HI FLOW THF 1500P

Known as BERGQUIST HI-FLOW 650P  
November 2018

## PRODUCT DESCRIPTION

Electrically Insulating, High Performance, Thermally Conductive Phase Change Material.

|                                       |                                                      |
|---------------------------------------|------------------------------------------------------|
| <b>Technology</b>                     | Silicone                                             |
| <b>Appearance</b>                     | Gold                                                 |
| <b>Reinforcement Carrier</b>          | Polyimide                                            |
| <b>Total Thickness</b><br>, ASTM D374 | 0.114 to 0.14mm                                      |
| <b>Film Thickness</b><br>, ASTM D374  | 0.025 to 0.05 mm                                     |
| <b>Inherent Surface Tack</b>          | 1 (1 or 2 side)                                      |
| <b>Application</b>                    | Thermal management,<br>Thermally conductive adhesive |
| <b>Operating Temperature Range</b>    | -40 to 150°C                                         |

## FEATURES AND BENEFITS

- Thermal impedance: 0.2°C-in<sup>2</sup>/W @ 25 psi
- 150°C high temperature reliability
- Natural tack one side for ease of assembly
- Exceptional thermal performance in an insulated pad

## TYPICAL APPLICATIONS

- Spring/clip-mounted devices
- Discrete power semiconductors and modules

BERGQUIST HI FLOW THF 1500P is a thermally conductive phase change material, reinforced with a polyimide film that is naturally tacky on one side. The polyimide film provides a high dielectric strength and cut-through resistance. BERGQUIST HI FLOW THF 1500P offers high temperature reliability ideal for automotive applications.

BERGQUIST HI FLOW THF 1500P is designed for use between a high-power electrical device requiring electrical isolation from the heat sink and is ideal for automated dispensing systems.

Bergquist recommends the use of spring clips to assure constant pressure with the component interface and the heat sink. Please refer to the TO-220 thermal performance data to determine the nominal spring pressure for your application.

## TYPICAL PROPERTIES

### Physical Properties

|                                                 |       |
|-------------------------------------------------|-------|
| Elongation , 45° to warp and fill, ASTM D882, % | 40    |
| Tensile Strength ASTM D882A, psi                | 7,000 |
| Phase Change Temperature, ASTM D3418, °C        | 52    |

Flammability Rating, UL 94

V-0

### Electrical Properties

|                                               |                    |
|-----------------------------------------------|--------------------|
| Dielectric Breakdown Voltage , ASTM D149, Vac | 5,000              |
| Dielectric Constant, ASTM D150 @ 1,000 Hz     | 4.5                |
| Volume Resistivity, ASTM D257, ohm-meter      | 1×10 <sup>12</sup> |

### Thermal Properties

|                                                           |     |
|-----------------------------------------------------------|-----|
| Thermal Conductivity , ASTM D5470, W/(m-K) <sup>(1)</sup> | 1.5 |
|-----------------------------------------------------------|-----|

### Thermal Performance vs. Pressure

TO-220 Thermal Performance, °C/W

@ 0.001"

|           |      |
|-----------|------|
| @ 10 psi  | 1.2  |
| @ 25 psi  | 1.15 |
| @ 50 psi  | 1.11 |
| @ 100 psi | 1.06 |
| @ 200 psi | 1.0  |

@ 0.0015"

|           |      |
|-----------|------|
| @ 10 psi  | 1.47 |
| @ 25 psi  | 1.41 |
| @ 50 psi  | 1.37 |
| @ 100 psi | 1.33 |
| @ 200 psi | 1.29 |

@ 0.002"

|           |      |
|-----------|------|
| @ 10 psi  | 1.59 |
| @ 25 psi  | 1.48 |
| @ 50 psi  | 1.43 |
| @ 100 psi | 1.38 |
| @ 200 psi | 1.35 |

Thermal Impedance, ASTM D5470, °C-in<sup>2</sup>/W <sup>(2)</sup>

@ 0.001"

|           |      |
|-----------|------|
| @ 10 psi  | 0.21 |
| @ 25 psi  | 0.2  |
| @ 50 psi  | 0.19 |
| @ 100 psi | 0.18 |
| @ 200 psi | 0.17 |

@ 0.0015"

|           |      |
|-----------|------|
| @ 10 psi  | 0.23 |
| @ 25 psi  | 0.22 |
| @ 50 psi  | 0.21 |
| @ 100 psi | 0.2  |



|           |      |
|-----------|------|
| @ 200 psi | 0.2  |
| @ 0.002"  |      |
| @ 10 psi  | 0.27 |
| @ 25 psi  | 0.27 |
| @ 50 psi  | 0.26 |
| @ 100 psi | 0.25 |
| @ 200 psi | 0.24 |

1) This is the measured thermal conductivity of the Hi-Flow coating. It represents one conducting layer in a three-layer laminate. The Hi-Flow coatings are phase change compounds. These layers will respond to heat and pressure induced stresses. The overall conductivity of the material in post-phase change, thin film products is highly dependent upon the heat and pressure applied. This characteristic is not accounted for in ASTM D5470. Please contact Bergquist Product Management if additional specifications are required.

2) The ASTM D5470 test fixture was used and the test sample was conditioned at 70°C prior to test. The recorded value includes interfacial thermal resistance. These values are provided for reference only. Actual application performance is directly related to the surface roughness, flatness and pressure applied.

## 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 HI FLOW THF 1500P are supplied in:

- Sheet form, roll form and die-cut parts
- Available with 1.0, 1.5 or 2.0 mil Polyimide reinforcement carrier

### Conversions

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

### Disclaimer

#### Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:**

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

**In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:**

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada Corporation, the following disclaimer is applicable:**

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

**Trademark usage:** [Except as otherwise noted] All trademarks in this document are trademarks and/or registered trademarks of Henkel and its affiliates in the U.S. and elsewhere.

Reference 1