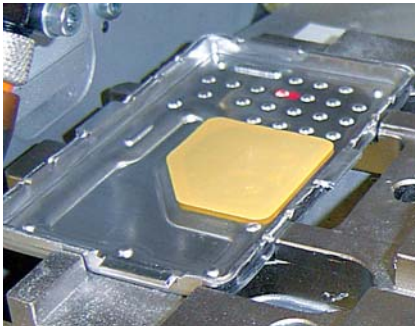


## Electrically Insulating, High Performance, Thermally Conductive Phase Change Material

### Features and Benefits

- Thermal Impedance: 0.20°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



Hi-Flow 650P 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 high cut through resistance. Hi-Flow 650P offers high temperature reliability ideal for automotive applications.

Hi-Flow 650P 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 Applications

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

### Configurations Available

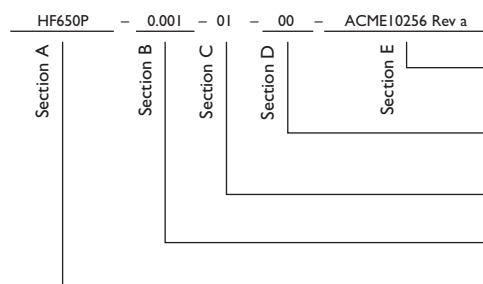
- Roll form, die-cut parts, sheet form
- Available with 1.0, 1.5 or 2.0 mil Polyimide reinforcement carrier

### TYPICAL PROPERTIES OF HI-FLOW 650P

PROPERTY	IMPERIAL VALUE	METRIC VALUE	TEST METHOD			
Color	Gold	Gold	Visual			
Reinforcement Carrier	Polyimide	Polyimide	—			
Thickness (inch) / (mm)	0.0045 - 0.0055	0.114 - 0.140	ASTM D374			
Film Thickness (inch) / (mm)	0.001 - 0.002	0.025 - 0.050	ASTM D374			
Inherent Surface Tack (1 or 2-Side)	I	I	—			
Elongation (%)	40	40	ASTM D882A			
Tensile Strength (psi)	7000	7000	ASTM D882A			
Continuous Use Temp (°F / °C)	-40 to 302	-40 to 150	—			
Phase Change Softening Temp (°F / °C)	126	52	ASTM D3418			
<b>ELECTRICAL</b>						
Dielectric Breakdown Voltage (Vac)	5000	5000	ASTM D149			
Dielectric Constant (1000 Hz)	4.5	4.5	ASTM D150			
Volume Resistivity (Ohm-meter)	10 <sup>12</sup>	10 <sup>12</sup>	ASTM D257			
Flame Rating	V-O	V-O	UL 94			
<b>THERMAL</b>						
Thermal Conductivity (W/m-K)(1)	1.5	1.5	ASTM D5470			
<b>THERMAL PERFORMANCE vs PRESSURE</b>						
	Pressure (psi)	10	25	50	100	200
TO-220 Thermal Performance (°C/W) 0.0010"		1.20	1.15	1.11	1.06	1.00
TO-220 Thermal Performance (°C/W) 0.0015"		1.47	1.41	1.37	1.33	1.29
TO-220 Thermal Performance (°C/W) 0.0020"		1.59	1.48	1.43	1.38	1.35
Thermal Impedance (°C-in <sup>2</sup> /W)(2) 0.0010"		0.21	0.20	0.19	0.18	0.17
Thermal Impedance (°C-in <sup>2</sup> /W)(2) 0.0015"		0.23	0.22	0.21	0.20	0.20
Thermal Impedance (°C-in <sup>2</sup> /W)(2) 0.0020"		0.27	0.27	0.26	0.25	0.24

1) This is the measured thermal conductivity of the Hi-Flow wax 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 for 5 minutes 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.

### Building a Part Number



### Standard Options

NA = Selected standard option. If not selecting a standard option, insert company name, drawing number, and revision level.  
 \_\_\_\_ = Standard configuration dash number, 1112 = 11" x 12' sheets, 11/250 = 11" x 250' rolls, or 00 = custom configuration  
 01 = Natural Tack  
 Standard Polyimide Thickness Available = 0.001", 0.0015", 0.002"  
 HF650P = Hi-Flow 650P Phase Change Material

Note: To build a part number, visit our website at [www.bergquistcompany.com](http://www.bergquistcompany.com).

Hi-Flow®: U.S. Patent 6,197,859 and others



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