



# APTEK LABORATORIES, INC.

ISO 9001 / AS9100 Certified

28570 Livingston Avenue, Valencia, CA 91355-4171 • (661) 257-1677 FAX (661) 257-8939

## PRELIMINARY TECHNICAL DATA & INFORMATION

### DIS-A-PASTE® 2150HV-PMF

Premixed-frozen, thermally-conductive, low modulus reworkable hybrid urethane underfill

### PRODUCT DESCRIPTION

**DIS-A-PASTE 2150HV-PMF** is a one component, premixed-frozen, mineral filled, electrically insulating flexible underfill. It is designed to flow between gaps via capillary action and dissipate device-generated heat. This unique underfill is flexible and will not impart excess stresses to components or substrates during temperature cycling and operational life. Due to its flexibility, it is easily repairable by mechanical methods.

**DIS-A-PASTE 2150HV-PMF** is a 100% solids, solvent free system that will not form voids during cure or outgas after being fully cured.

### KEY FEATURES AND BENEFITS

- Flexible for ease of repairability.
- Higher viscosity version with good surface tension to allow for penetration into gaps with clearances of 0.030" – 0.050"
- Long pot life, and snap cure for production friendly handling.
- Low modulus to minimize stress to sensitive components and ceramic substrates
- Can withstand 125°C continuously, with intermittent exposures up to 175°C

### HANDLING INFORMATION

Work life in syringe after thaw @ 25°C, 5 gm mass, hours >8

1. **DIS-A-PASTE 2150HV-PMF** syringes are shipped in dry ice. Upon receipt, transfer frozen syringes to a storage freezer @ -40°C or below.
2. To thaw remove a syringe from freezer and allow to warm to room temperature. Do not place in oven or microwave-this will shorten use life.
3. Typical thaw time for 3cc syringe @25°C ambient is approximately 10-15 minutes.
4. Recommended processing procedures: For best results, place the printed circuit board on a hot plate until the surface is heated and maintained at 115° - 125°C prior to dispensing. The dispense pattern should be optimized for each specific gap size. The objective is to apply a precise bead at the chip edge to allow for capillary action and a complete and void free "underfill" beneath the chip/component. Larger size areas require an "L" shaped dispense pattern starting in one corner and spanning out on both perpendicular sides. It is best to gradually increase the size of the "L" pattern via multiple passes. Start dispensing the first pass to span about 1/3 of the length of the chip for each side of the "L". Increase the length of the second pass to about 1/2 of the length of each side. On the third pass, traverse 3/4 the length of each side and the final pass, if needed, traverse the whole length of each side. This gradual multiple pass approach will ensure the most complete penetration and a void-free underfill. Work time at 95° - 105°C is approximately 5 minutes. Gelation at 125°C will occur in approximately 10-15-minutes.

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**CURE SCHEDULE\***

3 hours @ 125°C

Or

1 hour @ 150°C

\* Alternative cure schedules may be possible depending on application requirements.

**TYPICAL PROPERTIES**

(Values not to be used for specification purposes)

| <b><u>CHARACTERISTICS</u></b>   | <b><u>DIS-A-PASTE 2150HV-PMF</u></b>        | <b><u>TEST METHOD</u></b> |
|---|---|---------------------------|
| Color   | off-white                                   | Visual                    |
| Specific gravity  | 1.7   | ASTM D-1475               |
| Flash point, °C   | >100  | ASTM D-92                 |
| Shelf life @ -40°C, months in<br>factory sealed pre-mixed frozen-syringes | 3   |                           |
| <b><u>CURED PHYSICAL PROPERTIES</u></b>                                   | <b><u>DIS-A-PASTE 2150HV-PMF</u></b>        | <b><u>TEST METHOD</u></b> |
| Hardness, Durometer A   | 88  | ASTM D-2240               |
| Thermal conductivity, @25°C<br>W/mK                                       | 0.9   | Comparison                |
| Glass transition Temp (Tg), °C  | -60°C                                       | TMA Q400                  |
| Coefficient of thermal expansion, in/in/°C<br>Alpha 1<br>Alpha 2          | 40x10 <sup>-6</sup><br>163x10 <sup>-6</sup> | TMA Q400                  |
| <b><u>CURED ELECTRICAL PROPERTIES</u></b>                                 | <b><u>DIS-A-PASTE 2150HV-PMF</u></b>        | <b><u>TEST METHOD</u></b> |
| Volume resistivity<br>@25°C, ohm-cm                                       | 7.0 x 10 x <sup>14</sup>                    | ASTM D-257                |
| Dissipation factor<br>(D)/Dielectric constant (K) @25°C, 1 KHz            | 0.030/5.8                                   | ASTM D-150                |
| Dielectric strength,<br>0.125" thick, volts/mil                           | 325   | ASTM D-149                |

**SAFETY AND FIRST AID**

**DIS-A-PASTE 2150HV-PMF** is a mineral filled resin blend which is safe to handle as it is packaged in sealed syringes. There should be no need to touch the adhesive. Avoid contact with skin and eyes and use in a well-ventilated area and avoid breathing vapors. In case of eye contact, flush with fresh clean water for at least 15 minutes; for skin contact, wash thoroughly with soap and water. If swallowed, drink at least one pint of water and call a physician. Refer to Material Safety Data Sheet for more details

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