**APTEK® 2313-PMF**  
Premixed-frozen, snap-cure, electrically conductive, adhesive

**PRODUCT DESCRIPTION**

**APTEK** 2313-PMF is a one component, premixed-frozen, silver-filled, electrically conductive polymer paste adhesive. It is designed to bond many dissimilar substrates and dissipate device generated heat. **APTEK** 2313-PMF is a 100% solids, solvent free system that will not form voids during cure or outgas after being fully cured. **APTEK** 2313-PMF has excellent reversion resistance and physical stability when subjected to high heat and humidity environments. This system displays higher ionic purity than epoxy systems minimizing the possibility of corrosion on components and circuitry.

**KEY FEATURES AND BENEFITS**

- Production-oriented, snap-cure technology for surface mount applications - allows cure during solder reflow operation.
- High thixotropy "tack" strength - holds components with minimal “Z” axis movement during cure
- Stable viscosity for over 4 hours at RT - ideal for robotics
- Low Tg (<-50°C) for excellent low temperature cycling and performance with minimal stress
- Excellent substrate adhesion; superior to silicones: no primer required
- Wide temperature operating range: -50°C - +260°C in an inert atmosphere (i.e. under N₂) and -50°C – +170°C in air.

**HANDLING INFORMATION**

1. Work life @25°C in 5cc syringe after thaw: >4 hours with less than 50% viscosity increase  
2. **APTEK** 2313-PMF syringes are shipped in dry ice. Upon receipt transfer frozen syringes to a storage freezer @-40°C or below.  
3. To thaw remove from freezer and allow to warm to room temperature. Do not place in oven or microwave-this will shorten use life.  
4. Typical thaw time for 5cc syringe @25°C ambient is approximately 15-30 minutes.

**CURE SCHEDULE**

For adhesive applications (5-10 mils thickness):

- Through solder reflow process: 30 secs @260°C in conjunction with typical ramp-up and ramp-down oven profiles  
- For air-circulating oven (ACO) cures:

---

**- DISCLAIMER NOTICE -**

All statements, technical data, and recommendations expressed herein are based on tests believed to be reliable and accurate. However, **APTEK LABORATORIES, INC.** gives no warranty, expressed or implied, regarding the accuracy of this information. It is intended that the buyer and user of these products shall determine the suitability of the information provided for his specific application, and is responsible for its selection. **APTEK LABORATORIES, INC.** shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use or misuse of these products, or of the information given in these data bulletins. Purchasers assume all risk and liability whatsoever in connection with the use of these products and this information.
Temperature, °C | Cure time at temperature, min.
---|---
225 | 5
150 | 30
125 | 60
100 | 120
85 | 240

Notes:

1. Cure schedules above are valid when parts/substrates to be bonded and oven/chamber are at the required cure temperature.

2. The above cure schedules were determined by the achievement of lap shear strength for adhesive applications. These schedules are conservative and should be used as guidelines. Achievement of the application requirements/properties should be the determining factor in the selection of cure schedule.

**TYPICAL PROPERTIES**
(Values not to be used for specification purposes)

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>APTEK 2313-PMF</th>
<th>TEST METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>silver</td>
<td>Visual</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>3.0</td>
<td>ASTM D-1475</td>
</tr>
<tr>
<td>Viscosity @25°C, initial cps</td>
<td>thixotropic paste</td>
<td>ASTM D-1824</td>
</tr>
<tr>
<td>Flash point, °C</td>
<td>&gt;200</td>
<td>ASTM D-92</td>
</tr>
<tr>
<td>Shelf life @-40°C, months in factory sealed pre-mixed frozen-syringes</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

**CURED PHYSICAL PROPERTIES**

NOTE: Tests performed on material cured for 60 mins @125°C.

<table>
<thead>
<tr>
<th>TEST METHOD</th>
</tr>
</thead>
</table>

Lap shear, @25°C, Al to Al, psi
325

Glass transition temp., °C
<-50

Thermal conductivity, @25°C W/M°C
3.8

**CURED ELECTRICAL PROPERTIES**

<table>
<thead>
<tr>
<th>TEST METHOD</th>
</tr>
</thead>
</table>

Volume resistivity @25°C, ohm-cm
.003

QCP-006
SAFETY AND FIRST AID

APTEK 2313-PMF is a silver-filled hybrid polymer 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 ingested, drink at least one pint of water and call a physician. Refer to Material Safety Data Sheet for more details.

Revised: 06/19/18—mjv
Issued: 1/29/01

Aptek® is a registered trademark of Aptek Laboratories, Inc.