



APTEK LABORATORIES, INC.

ISO 9001 / AS9100 Certified

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TECHNICAL DATA & INFORMATION

APTEK® 2313LV-PMF

Premixed-frozen, low-outgassing, snap-cure, electrically conductive, adhesive.

PRODUCT DESCRIPTION

Aptek 2313LV-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 2313LV-PMF is a 100% solids, solvent free system that will not form voids during cure or outgas after being fully cured.

Aptek 2313LV-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.
- 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
- Exceeds NASA outgassing requirements for high vacuum environments
- 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 2313LV-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.

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CURE SCHEDULE

For adhesive applications (5-10 mils thickness):

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

<u>Temperature, °C</u>	<u>Cure time at temperature, min.</u>
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)

<u>CHARACTERISTICS</u>	<u>Aptek 2313LV-PMF</u>	<u>TEST METHOD</u>
Color	Silver	Visual
Specific gravity	2.9	ASTM D-1475
Viscosity @25°C, initial cps	Smooth, flowable thixotropic paste	ASTM D-1824
Flash point, °C	>200	ASTM D-92
Shelf life @-40°C, months in factory sealed pre-mixed frozen-syringes	6	JMTP C-100

<u>CURED PHYSICAL PROPERTIES</u>	<u>Aptek 2313LV-PMF</u>	<u>TEST METHOD</u>
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NOTE: Tests performed on material cured for 1 hour @ 125°C.

Lap shear, @25°C, Al to Al*, psi	390*	ASTM D-1002
Scuffed sanded 60 grit, IPA wiped		
Glass transition temp., °C	<-50	ASTM E 831
Thermal conductivity, @25°C W/M ² K	>2.5	ASTM E 1461-01
Outgassing @ 10 ⁻⁶ Torr		
TML, %	0.38	
CVCM, %	0.03	

*Lapshear values may vary according to cure schedule used. For example, when cured 1 hour at 125°C, typical lapshear values are \approx 550 psi.

<u>CURED ELECTRICAL PROPERTIES</u>	<u>Aptek 2313LV-PMF</u>	<u>TEST METHOD</u>
Volume resistivity @25°C, ohm-cm	0.002	ASTM D-257

SAFETY AND FIRST AID

Aptek 2313LV-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.

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