



# APTEK LABORATORIES, INC.

ISO 9001 / AS9100 Certified

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## TECHNICAL DATA & INFORMATION

### APTEK® 2512-A/B

Mil-spec approved, JP 10 fuel resistant urethane conformal coating

### PRODUCT DESCRIPTION

**APTEK 2512-A/B** is an unfilled, two component, electrically insulating, transparent, flexible urethane coating system designed for the encapsulation and protection of electronic devices mounted on printed circuit boards. For coating applications that require toughness, this system provides a combination of excellent flexibility and optimum tensile strength/elongation characteristics. This product was specifically designed to be resistant to jet fuels.

### KEY FEATURES AND BENEFITS

- Approved to Mil-I-46058C
- JP 10 fuel resistant
- Non-TDI based for safety
- Excellent reversion resistance for good physical stability under high heat and humidity environments
- Excellent substrate adhesion; no primer needed; superior to silicones
- Fluoresces under black-light (UV) to facilitate QC inspection of coating coverage
- Low viscosity and long work life for spraying or dipping operations

### HANDLING INFORMATION

|                                      |                           |
|--------------------------------------|---------------------------|
| Mix ratio, parts by weight           | 100 (2512-A)/ 50 (2512-B) |
| Work life, @25°C, 300 gm mass, hours | >6                        |
| Tack-free time @80°C, ACO, minutes   | 30                        |

#### Notes:

1. Work life adversely affected by heat and humidity as well as solvent evaporation.
2. Work life can be greatly extended by additions of thinner and/or periodical replenishment with freshly mixed APTEK 2512 A/B.

#### Handling Notes:

1. To reduce mixed viscosity, dilute A/B mixture with APTEK 2512 Thinner or reagent grade toluene as needed.
2. Part B is sensitive to moisture contamination. Use entire bottle of Part B for each application if possible. Unused portion must be blanketed with dry nitrogen or argon and resealed to avoid moisture contamination. Store 25°C.
3. Prior to use, examine Part B bottle for crystallization, excessive cloudiness, or formation of an insoluble white

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dimer precipitate. The precipitate is not harmful, however, follow instructions listed below for best results.

- Do not shake bottle. If liquid is clear with precipitate on bottom, then decant and use.
- Place unopened Part B bottles (NOTE: do not loosen cap) into an air circulating oven at 30-40°C until clear liquid is evident (white precipitate layer may also be present). Pint bottles will become clear within 16 hours @35°C.
- Carefully remove bottles from oven without disturbing contents. To use Part B, decant clear liquid out of bottle without disturbing the precipitate.

### MIXING

Weigh 100 parts of APTEK 2512 Part A into a clean dry glass, metal, or plastic container and then add 50 parts of APTEK 2512 Part B. Machine mix on slow speed or hand stir with glass or metal stirrer until complete and thorough blending is achieved. Care should be taken to avoid any source of moisture contamination or air entrapment during mix.

Note: For best results and a bubble-free coating, vacuum mixture at less than 10mm Hg for no more than 1 minute after "break" to avoid boiling the solvent from the mixture.

### CURE SCHEDULE

8 hrs. @ 85°C\*  
or  
4 hrs. @ 100°C\*  
or  
2 hrs. @ 120°C\*

\* It is recommended that coated substrates air dry 60 minutes at RT prior to heat cure to allow solvent evaporation which minimizes chance for bubble formation during heat cure.

Note: As typical with urethane systems, a relaxation/stabilization period of 2-4 days after cure is required before testing, service, or use.

### TYPICAL PROPERTIES

(values not to be used for specification purposes)

| <u>CHARACTERISTICS</u>                                   | <u>2512-A</u>        | <u>2512-B</u>              | <u>TEST METHOD</u> |
|--|----------------------|----------------------------|--------------------|
| Color  | pale yellow to amber | pale yellow to dark amber* | Visual             |
| Specific gravity   | 0.94                 | 0.96                       | ASTM D-1475        |
| Viscosity @ 20°C,cps                                     | 23                   | 16                         | ASTM D-1824        |
| Flash point, °C  | 7                    | 7                          | ASTM D-92          |
| Shelf life @25°C, months<br>in factory sealed containers | 6                    | 6                          |                    |

\* Due to slight variances in raw material coloration, the color of part B may occasionally have a green tint. This has no effect on any cured properties.

Notes: Shelf life may be reduced once containers are opened and material is exposed to air and moisture. To preserve maximum use life, blanket the contents of the containers with dry nitrogen or argon before resealing

| <b><u>CURED PHYSICAL PROPERTIES</u></b>       | <b><u>APTEK 2512-A/B</u></b> | <b><u>TEST METHOD</u></b> |
|---|------------------------------|---------------------------|
| Hardness, Durometer A                         | 79                           | ASTM D-2240               |
| Glass transition temp., °C                    | -20                          | ASTM E831-86              |
| Thermal coefficient of expansion,<br>in/in/°C | $354 \times 10^{-6}$         | ASTM E831-86              |
| Evidence of haze                              | None                         |                           |
| Fungus resistance                             | Non-nutrient                 | ASTM G-21                 |

**72 hour JP-10 soak @ 25°C:**

|                      |        |             |
|----------------------|--------|-------------|
| % weight change      | + 3.0% |             |
| Hardness before soak | 79A    | ASTM D-2240 |
| Hardness after soak  | 79A    | ASTM D-2240 |

| <b><u>CURED ELECTRICAL PROPERTIES</u></b>            | <b><u>APTEK 2512 A/B</u></b> | <b><u>TEST METHOD</u></b> |
|--|------------------------------|---------------------------|
| Volume resistivity, @25°C, ohm-cm                    | $>1 \times 10^{15}$          | ASTM D-257                |
| Dielectric constant, @1KHz, @25°C                    | 3.2                          | ASTM D-150                |
| Dissipation factor @1KHz, @25°C                      | 0.025                        | ASTM D-150                |
| Dielectric strength, 0.003" thick<br>film, volts/mil | >1500                        | ASTM D-149                |
| Insulation resistance, ohms                          | $3.3 \times 10^{13}$         | MIL-I-46058C              |

**SAFETY AND FIRST AID**

APTEK 2512-A is an unfilled polyol resin containing solvent and is thus considered a flammable liquid and should be treated with caution. Avoid storage temperatures above 25°C and keep away from flame, sparks, or other sources of ignition. Use in 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.

APTEK 2512-B is an organic isocyanate containing solvent and is thus considered a flammable liquid and should be treated with caution. Avoid storage temperatures above 25°C and keep away from flame, sparks, or other sources of ignition. May cause severe eye and skin irritation with direct contact. Inhalation of vapors may result in breathlessness, severe coughing, chest discomfort, and irritation of mucous membranes. Avoid skin and eye contact and use in well-ventilated, hooded area. In case of eye contact, flush profusely with fresh clean water and contact physician. For skin contact, wash thoroughly with soap and water. If inhaled, move subject to fresh air and provide fresh water to drink. If swallowed dilute, with at least one pint of water and contact physician immediately. Refer to Material Safety Data Sheet for more details.

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