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ISO 9001 / AS9100 Certified

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TECHNICAL DATA & INFORMATION

APTEK® 2512-A/B

- JP-10 fuel resistant, urethane conformal coating
- QPL-Listed to MIL-I-46058C

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 JP-10 jet fuel and meet the rigorous requirements of MIL-I-46058C.

KEY FEATURES AND BENEFITS

- Qualified to **Mil-I-46058C** and **IPC-CC-830C**
- JP-10 fuel resistant for environments with chemical exposure, such as missiles
- Non-TDI based for safety
- Excellent substrate adhesion; no primer needed; superior to silicones
- Fluoresces under black-light (UV) to facilitate QC inspection of coating coverage
- Provided as a ready-to-spray viscosity for convenience – no thinning required

HANDLING INFORMATION

Mix ratio, parts by weight	100 (2512-A)/ 50 (2512-B)
Work life, @25°C, 300 gm mass, hours	>2 hrs (see work life notes below)
Tack-free time @85°C, ACO, minutes	30

Work Life 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.
3. A/B mix may turn cloudy over time during its worklife, but cloudiness will not have any adverse effects on coating properties or visibility through coating to circuit board.

Handling Notes:
1. Part A may separate upon storage. Fully homogenize by shaking bottle prior to use.
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 at 25°C.
3. Prior to use, examine Part B bottle for excessive cloudiness or gelation. If present, do not use.

Spray Application Notes:
1. For best results, this coating should be used in a humidity-controlled area maintaining the relative humidity between 25-55% when the coating is atomized through conventional air-pressurized, spray equipment, such as a Binks 115 spray gun.
2. For curtain coated and non-atomized spray applications, call Aptek's tech service department to discuss application details.
3. Recommended coating build-up: this system was designed to be used with a cured coating thickness of 2-4 mils. Coating may be applied in multiple thin coatings if needed. However, it is recommended that coating be gelled – but not cured – and solvent free prior to applying the next coat to avoid solvent entrapment in system. Do not fully cure base coat before applying a second coat. For the base coat, it is suggested to allow solvent to flash off for 30-60 min @ RT prior to placing coating in ACO @ 85°C for up to 30 minutes to gel, then the second coat can be spray applied.

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 15 seconds after "break" to avoid boiling the solvent from the mixture.

CURE SCHEDULE

To reduce chances of bubble formation/entrapment, air dry 30-60 minutes at RT prior to using one of the two heat cure options listed below:

12 hrs. @ 85°C (-0°C, + 5°C)

-OR-

8 hrs. @ 100°C (-0°C, + 5°C)

-PLUS-

One of the two following RT post-cures:

1. **NORMAL PRODUCTION USE:** As typical with urethane systems, a relaxation/stabilization period of 3-5 days at RT, 30-60% RH, after cure is required before normal testing, service, or use.

-OR-

2. **DIRECT MIL-SPEC TESTING:** If the coated circuit boards are to be directly tested to the rigors of Mil I 46058C, let heat-cured boards post cure @ RT and 30-65% RH for a minimum of 14 days prior to testing. If RH is below 30%, longer time may be required for ultimate cure.

TYPICAL PROPERTIES

(Values not to be used for specification purposes)

CHARACTERISTICS	2512-A	2512-B	TEST METHOD
Color	pale yellow to amber	pale yellow to dark amber*	Visual
Specific gravity	0.92	1.01	ASTM D-1475
Viscosity @ 20°C,cps	24	22	ASTM D-1824
Flash point, °C	7	7	ASTM D-92
Shelf life @25°C, months 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

CURED PHYSICAL PROPERTIES	APTEK 2512-A/B	TEST METHOD
Cured coating appearance	Transparent; hazy on glass slide	Visual
Glass transition temp., °C	-20	ASTM E831
Thermal coefficient of expansion, in/in/°C alpha 1	70×10^{-6}	ASTM E831
alpha 2	230×10^{-6}	
Fungus resistance	Non-nutrient	ASTM G-21

72 hour JP-10 soak @ 25°C:
(tested on ½ " thick, unsolvated castings)

% weight change	+ 3.5%

CURED ELECTRICAL PROPERTIES	APTEK 2512-A/B	TEST METHOD
Volume resistivity, @25°C, ohm-cm	$>1 \times 10^{14}$	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 film, volts/mil	>1500	ASTM D-149
Insulation resistance, ohms	3.3×10^{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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