



APTEK LABORATORIES, INC.

ISO 9001/AS9100 Certified

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TECHNICAL DATA & INFORMATION

APTEK® 2100-A7C/B

Low modulus urethane thixotropic encapsulant

PRODUCT DESCRIPTION

APTEK 2100-A7C/B is a thixotropic, medium viscosity, two component, electrically insulating, low modulus urethane system designed for the encapsulation of electrical/electronic components to printed circuit boards. Although **APTEK 2100-A7C/B** is capable of achieving full cure at room temperature, however, a short term exposure to moderate heat will greatly reduce processing time and optimize cured properties.

KEY FEATURES AND BENEFITS

- 100% solids, solvent free system that will not form voids during cure or service life
- Low Tg for excellent low-temperature cycling and performance
- Very good substrate adhesion; superior to silicones
- Exceeds NASA outgassing requirements for high vacuum environments

HANDLING INFORMATION

Mix ratio, parts by weight: 107 (2100-A7C) / 20 (2100-B)

Work life, @ 25°C, 100 gm, 50% RH, minutes: >20

Notes:

- Prior to use, examine Part B bottle for crystallization or formation of an insoluble white precipitate which is a solid dimer of the liquid Part B. The precipitate is not harmful; however follow instructions listed below for best results.

- DO NOT SHAKE BOTTLE

- Place unopened Part B bottles into an air circulating oven at 45-60°C until clear amber to slightly hazy liquid is evident (white precipitate layer may also be present).

- Carefully remove bottles from oven without disturbing contents. If liquid contains gelled material - DO NOT USE! To use Part B, decant clear liquid out of bottle without disturbing the precipitate. Excess Part B has been packaged to insure sufficient supply of liquid.

- 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°-30°C

- DISCLAIMER NOTICE -

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MIXING

1. **For non-pre-measured kits:** Weigh 107 parts of APTEK 2100 Part A7C into clean dry glass, metal, or plastic container and then add 20 parts of APTEK 2100 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.
2. **For pre-measured kits:** There is no need for a scale or balance. Drain entire contents of Part B bottle into Part A container. Mix by hand with clean, dry metal spatula until uniform. Do not create bubbles during mixing. Care should be taken to avoid any source of moisture contamination or air entrapment during mix. Relative humidity during mixing and processing should be maintained below 50%. For best results, and a void free bond line, vacuum mixture at less than 10 mm Hg for 3-5 minutes after "break".

Due to the type of fillers in this product, specks may be visible by examination under the microscope.

Note: For best results and a void free bond line, vacuum mixture at less than 10 mm Hg for 5-10 mins.

CURE SCHEDULE

7 days @ 25°C
 or
 2 hours @ RT + 5 hours @ 80°C
 or
 2 hours @ RT + 3 hours @ 100 °C

Notes:

1. As typical with urethane systems, a relaxation/stabilization period of 2-4 days at RT after cure is required before testing, service, or use.
2. For best results, and a void free bond line, vacuum mixture at less than 10 mm Hg for 3-5 minutes after "break".
3. For optimum properties, it is best to cure **APTEK 2100-A7C/B** using one of the heat methods recommended above.
4. Cured material exposed to excess heat and long term aging may darken in color over time. Please note that this is a natural occurrence and no adverse effects to mechanical or electrical properties take place.

TYPICAL PROPERTIES

(Values not to be used for specification purposes)

| <u>CHARACTERISTIC</u> | <u>2100-A7C</u> | <u>2100-B</u> | <u>TEST METHOD</u> |
|------------------------------|------------------------|----------------------|---------------------------|
| Color | Pale to milky white | Pale yellow to amber | Visual |
| Clarity | Hazy | Clear to hazy | |
| Specific gravity | 0.99 | 1.2 | ASTM D-1475 |
| Viscosity @25°C,cps | smooth, thixotropic | 40 | ASTM D-1824 |
| Flash point, °C | >150 | >150 | ASTM D-92 |

| | | |
|---|---|---|
| Shelf life @ 25°C, months in factory sealed containers | 6 | 6 |
|---|---|---|

| <u>CURED PHYSICAL PROPERTIES</u> | <u>2100-A7C/B</u> | <u>TEST METHOD</u> |
|---|----------------------|--------------------|
| Hardness, Durometer A | 55 | ASTM D-2240 |
| Tensile strength, psi | 400 | ASTM D-412 |
| Elongation, % | 265 | ASTM D-412 |
| Glass transition temp.,°C | -65 | ASTM E-831 |
| Thermal coefficient of expansion, in/in/°C | | |
| alpha 1 | 79×10^{-6} | ASTM E-831 |
| alpha 2 | 185×10^{-6} | ASTM E-831 |
| Outgassing @ 10^{-6} Torr | | |
| TML, % | 0.38 | ASTM E-595 |
| CVCM, % | 0.03 | ASTM-E-595 |

| <u>CURED ELECTRICAL PROPERTIES</u> | <u>2100-A7C/B</u> | <u>TEST METHOD</u> |
|--|----------------------|--------------------|
| Volume resistivity @25°C,ohm-cm | 5.3×10^{15} | ASTM D-257 |
| Dissipation factor (D)/Dielectric constant (K) @25°C, 1 KHz | 0.030/3.5 | ASTM D-150 |
| Dielectric strength, 0.100", 25°C, Volts/Mil. | 360 | ASTM D-149 |

SAFETY AND FIRST AID

APTEK 2100-A7C is a filled polyol resin that is safe to handle when used properly. It is judged to be low in toxicity and to be rated as a slight skin irritant. 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.

APTEK 2100-B is an organic isocyanate which may cause eye and skin irritation with direct contact. Inhalation of vapors may result in breathlessness, coughing, chest discomfort, and irritation of mucous membranes. Avoid skin and eye contact, and for 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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