



APTEK LABORATORIES, INC.

ISO 9001/ AS9100 Certified

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TECHNICAL DATA & INFORMATION

DIS-A-PASTE® 2003-A/B

Long work life, thermally conductive urethane adhesive

PRODUCT DESCRIPTION

DIS-A-PASTE 2003-A/B is a two component, mineral filled, electrically insulating soft urethane paste adhesive. It is designed to bond many dissimilar substrates and dissipate device generated heat.

DIS-A-PASTE 2003-A/B is a 100% solids, solvent free system that will not form voids during cure or outgas after being fully cured.

DIS-A-PASTE 2003-A/B is a non-TDI based urethane system which has outstanding reversion resistance and physical stability when subjected to high heat and humidity environment. As a urethane, this system displays higher ionic purity than epoxy systems minimizing the chance of corrosion around sensitive components and circuitry.

KEY FEATURES AND BENEFITS

- Low modulus/high elongation for minimum stress to sensitive components and ceramic substrates
- Low Tg for excellent low temperature cycling and performance
- Long work life with minimum viscosity change for robotic or large production operations
- Excellent substrate adhesion; superior to silicones
- Wide operating temperature range (-65°C - 100°C) for versatility
- Exceeds NASA outgassing requirements for high vacuum environments
- Bonds DAT-A-THERM 1000™ film to devices and substrates without loss of thermal conductivity
- Available in pre-mixed frozen syringes designated DIS-A-PASTE 2001-PMF
- Product also available with 10 mil bondline spacers - designated DIS-A-PASTE 2003.010-A/B

HANDLING INFORMATION

Mix Ratio, parts by weight: 100 (2003-A)/5.5 (2003-B)

Recommended weighing tolerances: Part A: 100±0.5; Part B: 5.5±0.05

Work life, @25°C, 25 gm mass, hours >3

Handling Notes:

1. Check for filler settlement in Part A with clean, dry, metal spatula. If necessary, remix slowly by hand until uniform.
2. Part B is moisture sensitive, store @25-30°C, below 50% RH.

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3. 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.

MIXING

Weigh 100 parts of DIS-A-PASTE 2003 part A into a clean, dry, glass, metal, or plastic container and then add 5.5 parts of DIS-A-PASTE 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.

CURE SCHEDULE*

6 hours @ 85°C
or
4 hours @ 100°C

* Alternative cure schedules may be possible depending on application requirements.

Note:

1. Adhesive will be tack free and parts can be handled after heat cure.
2. As typical with urethane systems, a relaxation/stabilization period of 2-4 days after cure is required before testing, service, or use.
3. For best results and a void free bond line, vacuum mixture at less than 10 mm Hg for 5-10 minutes after break.

TYPICAL PROPERTIES

(values not to be used for specification purposes)

<u>CHARACTERISTICS</u>	<u>2003-A</u>	<u>2003-B</u>	<u>TEST METHOD</u>
Color	Off-White	Clear	Visual
Specific gravity	2.07	1.12	ASTM D-1475
Viscosity @25°C,cps	190,000	2700	ASTM D-1824
Flash point, °C	>200	>150	ASTM D-92
Shelf life @25°C, months factory sealed containers	6	6	

<u>CURED PHYSICAL PROPERTIES</u> *Cured 4 hours @ 100°C	<u>DIS-A-PASTE 2003-A/B</u>	<u>TEST METHOD</u>
Hardness, Durometer A, ½" casting	83	ASTM D-2240
Lap shear, Al to Al, psi @ 5 mil bondline @ 10 mil bondline	610 450	ASTM D-1002
Tensile strength, psi	550	ASTM D-638
Elongation, %	90	ASTM D-638
Linear shrinkage, inch/inch 10 inch, 1 inch diameter bar Cured 6 hrs @ 85°C	0.007	ASTM D-2566

DIS-A-PASTE 2003-A/B

Glass transition temp., °C	-60	ASTM E-831
Thermal coefficient of expansion, in/in/°C	alpha 1 alpha 2	ASTM E-831 ASTM E-831
Thermal conductivity, W/mK	31 x 10 ⁻⁶ 137 x 10 ⁻⁶ 0.74	ASTE E-1461
Outgassing @ 10 ⁻⁶ Torr		
TML, %	0.27	ASTM E-595
CVCM, %	0.005	ASTM E-595
Evidence of haze	none	ASTM E-595

CURED ELECTRICAL PROPERTIES**DIS-A-PASTE 2003-A/B****TEST METHOD**

Volume resistivity @25°C, ohm-cm	2.0 x 10 ¹⁴	ASTM D-257
Dissipation factor (D)/ Dielectric constant (K) @ 25°C, 1 KHz	0.02/5.4	ASTM D-150
Dielectric strength, 0.050" thick, volts/mil	620	ASTM D-149
0.500" thick, volts/mil	340	ASTM D-149

SAFETY AND FIRST AID

DIS-A-PASTE 2003-A is a mineral 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.

DIS-A-PASTE 2003-B is an organic isocyanate which 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 a well-ventilated, hooded area. In case of eye contact, flush profusely with fresh air and provide 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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