



APTEK LABORATORIES, INC.

ISO 9001/ AS9100 Certified

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TECHNICAL DATA & INFORMATION

DAT-A-THERM™ 1303 B/C/B®

Highly thermally conductive, electrically insulating hybrid urethane film adhesive

PRODUCT DESCRIPTION

DAT-A-THERM 1303 B/C/B is a low modulus, flexible, void free, electrically insulating hybrid urethane film adhesive designed to bond dissimilar components and substrates. This **B/C/B** system is designed to manage stresses developed from mismatches of thermal expansion coefficients during temperature cycling as well as to dissipate heat generated from components and circuitry.

DAT-A-THERM 1303 B/C/B technology incorporates a partially-cured (B-staged) adhesive on both faces of a fully-cured (C-staged) ultra low modulus film. **DAT-A-THERM 1303 B/C/B** film is a 100% solids, thermoset polymer, which will not outgas, while in place and is suitable for high vacuum environments. The film exhibits good reversion resistance and physical stability under long-term aging of high humidity and heat.

KEY FEATURES AND BENEFITS

- Low modulus/high elongation for minimum stress buildup under components
- Low T_g - remains flexible to -70°C
- Exceeds NASA outgassing requirements for high vacuum environments
- Typical cured film thickness, 0.008" to 0.012". Custom thicknesses available.
- Available in sheet or die-cut forms
- Low tack adhesive layer allows for easy placement and, if needed, repositioning on assemblies
- Reworkable to recover costly components and substrates

HANDLING INFORMATION

DAT-A-THERM 1303 B/C/B film adhesive is supplied in frozen sheet or die-cut form, and must be stored at -40°C or below. Remove sheet or die-cut piece from the freezer and peel off the release film from both sides while still cold. Lay the B/C/B gently on a piece of the release film and allow to come to room temperature naturally – do not apply heat.

Notes: For sheet stock, which needs to be cut by user:

1. Allow B/C/B to warm to RT following the instructions stated above. This should easily occur within 5-7 minutes. Do not let B/C/B stand more than 10 minutes before cutting.
2. Place B/C/B sheet on a clean, hard glass or steel surface and gently place a straight edge or template directly on top of the B/C/B. Do not apply any excess pressure. Be careful not to disturb or flake off the B-stage adhesive.
3. Carefully cut to size using a razor knife with a new, sharp blade. Although some minor flaking of the B-stage adhesive may occur at the edge being cut, there still should be sufficient adhesive remaining to ensure a good bond.

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CURE SCHEDULE

1 hour @ 125°C

Notes:

1. For best results, maintain 4-8 psi pressure on parts/assemblies to be bonded during cure cycle
2. Alternative cure schedule may be possible depending on application requirements

TYPICAL PROPERTIES

(values not to be used for specification purposes)

<u>CHARACTERISTICS</u>	<u>DAT-A-THERM 1303 B/C/B</u>	<u>TEST METHOD</u>
Color	off-white	Visual
Specific gravity	1.82	ASTM D-1475
Shelf Life @ -40°C, factory sealed containers, months	4	
<u>CURED PHYSICAL PROPERTIES</u>	<u>DAT-A-THERM 1303 B/C/B</u>	<u>TEST METHOD</u>
Al to Al Lap Shear, 10 mil bondline, 25°C, psi	500	ASTM D-1002
Tensile modulus, 0.005", psi		
@ 55°C	600	ASTM D-638
@ 25°C	750	
@ -55°C	1700	
Glass Transition Temp., °C	-75	ASTM E 831-86
Thermal coefficient of expansion in/in/°C		
alpha 1	40 x 10 ⁻⁶	ASTM E 831-86
alpha 2	160 x 10 ⁻⁶	
Moisture absorption, %	0.15	ASTM D-570
Thermal conductivity, W/m°K	>1.5	
Outgassing at 10 ⁻⁶ Torr		
TML, %	0.45	ASTM E-595
CVCM, %	0.03	
<u>CURED ELECTRICAL PROPERTIES</u>	<u>DAT-A-THERM 1303 B/C/B</u>	<u>TEST METHOD</u>
Volume resistivity, @ 25°C, ohm-cm	7.0 x 10 ¹⁴	ASTM D-257
Dissipation Factor (D)/Dielectric Constant (K) @ 25°C, 1 KHz	0.03/5.8	ASTM D-150
Dielectric strength, 0.005", volts/mil	1000	ASTM D-149

SAFETY AND FIRST AID

DAT-A-THERM 1303 B/C/B is a mineral filled polymer system which is safe to handle as it is packaged between release films and exposure should be minimal. Use clear plastic or rubber gloves when handling thawed film. 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 water and call a physician. Refer to Material Safety Data Sheet for more details.

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