Ablestik
a National Starch & Chemical Company

ABLETHERM® 2600AT
HIGH THERMAL CONDUCTIVITY ADHESIVE

DESCRIPTION

ABLEBTHERM® 2600AT adhesive has been developed for thermal management applications. It is recommended for applications requiring high heat extraction from the die, such as high power and discrete devices. This material is a high thermal conductivity die attach adhesive.

This adhesive uses a unique suspension system containing silver and resin particles suspended in a solvent carrier. Once the material is fully cured and the solvent is evaporated, the adhesive has an extremely high silver loading.

ABLEBTHERM® 2600AT adhesive was previously known as Experimental product RP-649-4.

FEATURES

- High thermal and electrical conductivity
- Low bleed
- Long work life

Typical Uncured Properties	*ABLETHERM 2600AT*	*Test Description*	*Test Method*
Filler Type	Silver		
Viscosity @ 25ºC	8500 cP	Brookfield CP51 @ 5 rpm	ATM-0018
Thixotropic Index	6.0	Viscosity @ 0.5/Viscosity @ 5 rpm	ATM-0089
WorkLife @ 25ºC	24 hours	25% increase in viscosity @ RT	ATM-0087
Storage Life @ -40ºC	6 months		ATM-0068
Cure Process Data	***ABLETHERM 2600AT***	***Test Description***	***Test Method***
Weight Loss on Cure	9.19%	10 x 10 mm Si die on glass slide	ATM-0031
Recommended Cure Condition	30 minutes ramp from RT to 200ºC + 15 minutes @ 200ºC		
Alternate Cure Condition	30 minutes ramp from RT to 175ºC + 1 hour @ 175ºC		
PHYSIOCHEMICAL PROPERTIES - Post Cure	***ABLETHERM 2600AT***	***Test Description***	***Test Method***
Ionics Chloride Sodium Potassium	4 ppm 8 ppm < 1 ppm	Teflon flask, 5 gm sample/20-40 mesh, 50 gm DI water, 100ºC for 24 hours	ATM-0007
Water Extract Conductivity	22 µmhos/cm	Conductometer	ATM-0044
pH	4.4	pHmeter	ATM-0002

Typical properties are not intended for use as specification limits. If you need to write a specification, ask for our Standard Release Specification. This is a Developmental product that is in the process of being converted to high volume manufacturing. During the scale-up procedure, certain properties may be adjusted slightly.

2600AT

PHYSIOCHEMICAL PROPERTIES - Post Cure	ABLETHERM 2600AT	Test Description	Test Method
Glass Transition Temperature	84ºC	TMA penetration mode	ATM-0058
Coefficient of Thermal Expansion Below Tg Above Tg	 36.1 ppm/ºC 111.1 ppm/ºC	TMA expansion mode	ATM-0055
Dynamic Tensile Modulus @-65ºC @ 25ºC @ 150ºC @ 250ºC	 5300 MPa (763,000 psi) 3600 MPa (529,000 psi) 300 MPa (43,000 psi) 210 MPa (31,000 psi)	Dynamic mechanical thermal analysis (DMTA) using <0.5mm thick sample	ATM-0112
Moisture Absorption @ Saturation	0.25%	Dynamic vapor sorption after 85ºC/ 85% RH exposure	ATM-0093

THERMAL/ELECTRICAL PROPERTIES - Post Cure	ABLETHERM 2600AT	Test Description	Test Method
Thermal Conductivity	20 W/mK	Independent Laser Flash	ATM-0116
Volume Resistivity	0.00005 ohm-cm	4-point probe	ATM-0020
Bond Joint Resistance	0.00005 ohms/0.5 sq. in.	Cu to Cu joint 25 µm bondline thickness	ATM-0032

MECHANICAL PROPERTIES - Post Cure	ABLETHERM 2600AT	Test Description	Test Method
Die Shear Strength @ 25ºC	8.1 kg_f/die	2 x 2mm (80 x 80 mil) Si die on Ag/Cu leadframe	ATM-0052

Die Shear Strength (kg_f/die) vs. Temperature — ATM-0052

@25ºC	@200ºC	@250ºC	3x3mm (120x120 mil) Si die on:
18.3	1.3	1.1	Ag/Cu leadframe
12.7	1.2	1.1	Cu leadframe
16.4	1.2	0.9	Pd/Ni leadframe
9.7	2.3	2.1	Au flash leadframe

Chip Warpage @ 25ºC vs. Chip Size — ATM-0059

Chip Size	Warpage	0.38mm (15mil) thick Si die on Ag/ Cu leadframe
7.6x7.6mm (300 x 300 mil)	15 µm	
12.7x12.7mm (500x500mil)	58 µm	

APPLICATION GUIDELINES

SHIPMENT

This Ablestik product is packed and shipped in dry ice at –80ºC. Inside every dry ice shipment of Ablestik's products is a small packet containing the ABLECUBE. This is a small blue cube which retains its shape at –40ºC. If the ABLECUBE is exposed to temperatures higher than –40ºC, the cube will melt.

Please check the state of the ABLECUBE to ensure the integrity of the shipment. If the ABLECUBE has melted upon Receiving inspection, place the entire shipment in a –40ºC freezer and contact your Ablestik Customer Service or Sales Representative.

UNPACKING

Transfer the syringes from the dry ice to a –40ºC freezer without ANY delays. Freeze-thaw voids will form in the syringes if the syringes are repeatedly thawed and refrozen.

STORAGE

This Ablestik product must be stored at –40ºC. The shelf life of the material is only valid when the material has been stored at the specified storage condition. Incorrect storage conditions will degrade the performance of the material in both handling (e.g. dispensing or screen printing) and final cured properties.

THAWING

Allow the container to reach room temperature before use. After removing from the freezer, set the syringes to stand vertically while thawing. Refer to the Syringe Thaw Time chart for the thaw time recommendation.

DO NOT open the container before contents reach ambient temperature. Any moisture that collects on the thawed container should be removed prior to opening the container.

DO NOT re-freeze. Once thawed to room temperature, the adhesive should not be re-frozen.

ADHESIVE APPLICATION

DISPENSING

This adhesive is a unique suspension system that contains polymer and conductive particles in a solvent carrier. These particles can sometimes agglomerate and could make dispensing difficult for some applications. Due to the unique rheology of this adhesive, clogging of longer dispense tubes may occur due to particle packing. Use of short dispense tubes is recommended.

For consistent and uniform dispensing, a 457mm (18 mil) or greater ID needle is suggested for this adhesive. For sizes smaller than 2 x 2mm and thinner dies, a smaller ID needle may be used.

Solvent bleed-out that appears after dispensing will vilatilize during the oven cure process. Once it volatilizes, it will not redeposit onto the leadframes. For best results, our recommended cure profile is suggested.

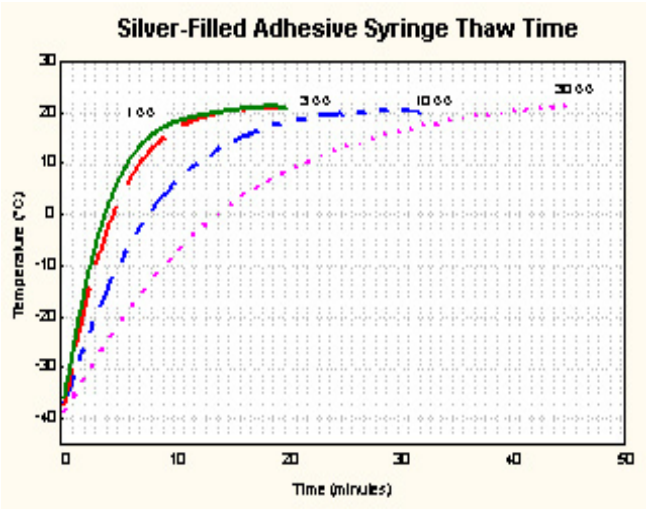
Contact Ablestik Technical Service Department for detailed recommendation on adhesive application, including dispensing.

CURE

For optimum cure properties, cure according to the recommended cure cycles in the Cure Process data section of this Technical Data Sheet.

AVAILABILITY

ABLETHERM® adhesives are packaged in syringes or jars per customer specification. Available package sizes range from 1cc to 30cc and 1 ounce to 1 pound. For details, refer to the Ablestik Standard Package Data Set or contact your Customer Service Representative.



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