Ablestik

ABLEBOND 8360

August 2010

PRODUCT DESCRIPTION

ABLEBOND 8360 provides the following product characteristics:

Technology	Epoxy
Appearance	Silver
Cure	Heat cure
Product Benefits	• Excellent dispensability, minimal tailing and stringing • Box oven cure • Minimal resin bleed • Low condensable volatiles • High purity • Electrically conductive
Application	Die attach
Filler Type	Silver
pH	4.2

ABLEBOND 8360 die attach adhesive is designed for high reliability packaging applications. The unique properties result in superior autoclave reliability test performance of the final assembled devices.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	4.2
Viscosity, Brookfield CP51, 25 °C, mPa·s (cP):	
Speed 5 rpm	7,900
Work Life @ 25°C, hours	20
Shelf Life @ -40°C (from date of manufacture), year	1

TYPICAL CURING PERFORMANCE

Cure Schedule

1 hour @ 175°C

Alternative Cure Schedule for Metal Leadframe Die Attach

5ºC per minute ramp to 175ºC + 1 hour @ 175ºC

Alternative Cure for BGA Die Attach

2 hours @ 100°C + 30 minute ramp to 175°C + 1 hour @ 175ºC

Weight Loss on Cure

10 x 10 mm Si die on glass slide, %	3.4

Both cure options were observed to yield reduced bondline voiding and increased strength. Dwell at low temperature is recommended to allow vaporization of diluents prior to gelation

The above cure profiles are guideline recommendations. Cure conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion :		
Below Tg, ppm/°C		45
Above Tg, ppm/°C		200
Glass Transition Temperature (Tg) by TMA, °C		88
Thermal Conductivity @ 121°C, W/mK		2.9
Tensile Modulus, DMTA :		
@ -65 °C	N/mm² (psi)	5,800 (840,000)
@ 25 °C	N/mm² (psi)	5,000 (730,000)
@ 150 °C	N/mm² (psi)	360 (52,000)
@ 250 °C	N/mm² (psi)	270 (39,000)
Extractable Ionic Content, @ 100°C ppm:		
Chloride (Cl-)		<20
Sodium (Na+)		<10
Potassium (K+)		<5
Water Extract Conductivity, µmhos/cm		15
Weight Loss @ 300ºC, %		0.7
Moisture Absorption @ Saturation, wt.% @ 85°C/85°RH		0.55

Electrical Properties:

Volume Resistivity, ohms-cm	0.0005

TYPICAL PERFORMANCE OF CURED MATERIAL

Die Shear Strength:

2 X 2 mm Si die, kg-f,

Substrate	@25°C
Ag/Cu leadframe	11

3 X 3 mm Si die, kg-f,

**Data generated using alternate ramp cure condition*

Substrate	@25°C	@200°C	@250°C
Ag/Cu LF	29	1.3	1.0
Bare Cu LF	9.0	0.82	0.56
Pd/Ni/Cu LF	17	1.3	0.87
Au BT-Resin Board	32*	3.5*	2.5*

3 X 3 mm Si die, kg-f,
After 85ºC/85% RH exposure for 168 hours

Substrate	@25°C	@200°C
Ag/Cu LF	25	1.3
Bare Cu LF	10	0.7
Pd/Ni/Cu LF	19	1.3

Henkel

3 X 3 mm Si die, kg-f,
After 30ºC/60% RH exposure for 192 hours
**Data generated using alternate ramp cure condition*

Substrate	@25°C	@200°C
Au-BT Resin Board	26*	2.1*

Chip Warpage vs Chip Size:

0.38 mm thick Si die on 0.2 mm thick Ag/Cu LF @ 25°C, µm

Chip Size:	Warpage:
7.6 x 7.6mm	10
10.2 x 10.2mm	18
12.7 x 12.7mm	26

0.38 mm thick Si die on 0.48 mm Au BGA @ 25°C, µm

Chip Size:	Warpage:
7.6 x 7.6mm	10
10.2 x 10.2mm	23

Chip Warpage vs Post Cure Thermal Process:

7.6 x 7.6 x 0.38 mm Si die on 0.2 mm thick Ag/Cu LF, µm

Post Cure	+ Wirebond (1 min @ 250ºC)	+Post Mold Bake (4 hrs @ 175ºC)
12	15	15

7.6 x 7.6 x 0.38 mm Si die on 0.48 mm thick Au BGA, µm

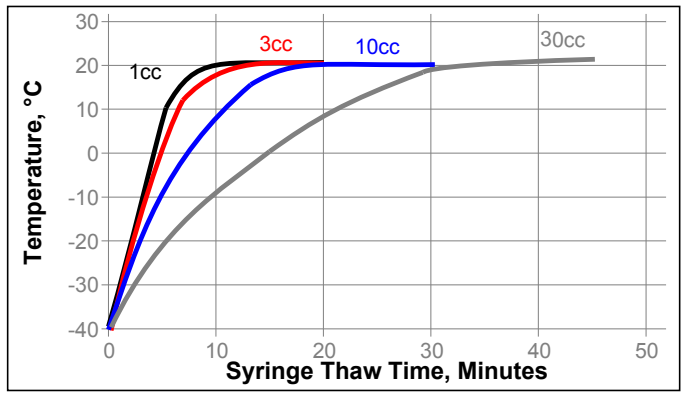
Post Cure	+ Wirebond (1 min @ 250ºC)	+Post Mold Bake (4 hrs @ 175ºC)
10	11	9.2

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

THAWING:

1. Allow container to reach room temperature before use.
2. After removing from the freezer, set the syringes to stand vertically while thawing.
3. Refer to the Syringe Thaw time chart for the thaw time recommendation.
4. DO NOT open the container before contents reach 25°C temperature. Any moisture that collects on the thawed container should be removed prior to opening the container.
5. DO NOT re-freeze. Once thawed to -40°C, the adhesive should not be re-frozen.



DIRECTIONS FOR USE

1. Thawed adhesive should be immediately placed on dispense equipment for use.
2. If the adhesive is transferred to a final dispensing reservoir, care must be exercised to avoid entrapment of contaminants and/or air into the adhesive.
3. Adhesive must be completely used within the products recommended work life of 24 hours.
4. Silver-resin separation may occur if the adhesive is left out at 25°C beyond the recommended work life.
5. Apply enough adhesive to achieve a 25 to 50 µm wet bondline thickness, dispensed with approximately 25 to 50 % filleting on all sides of the die.
6. Alternate dispense amounts may be used depending on the application requirements.
7. Star or crossed shaped dispense patterns will yield fewer bondline voids that the matrix style of dispense pattern.
8. Organic substrates should be dried prior to die bonding. High moisture content in organic Ball Grid Array (BGA) substrates may cause excessive voiding and/or die delamination during the adhesive cure process. A minimum drying condition of 2 hours at 125ºC is recommended for BGA substrates.
9. Oven should be pre-heated to 175ºC before introducing the leadframe magazines.

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage: -40 °C. Storage below minus (-)40 °C or greater than minus (-)40 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Conversions
(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Note
The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage
Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 0.1