Ablestik

ABLEBOND 84-1LMISR4

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PRODUCT DESCRIPTION

ABLEBOND 84-1LMISR4 provides the following product characteristics:

Technology	Epoxy
Appearance	Silver
Cure	Heat cure
pH	6.0
Product Benefits	• Conductive • Box oven cure • Excellent dispensability, minimal tailing and stringing
Application	Die attach

ABLEBOND 84-1LMISR4 electrically conductive die attach adhesive has been formulated for use in high throughput, automated die attach equipment. The rheology of ABLEBOND 84-1LMISR4 adhesive allows minimum adhesive dispense and die put down dwell times, without tailing or stringing problems. The unique combination of adhesive properties makes this material one of the most widely used die attach materials in the semiconductor industry.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	5.6
Viscosity, Brookfield CP51, 25 °C, mPa·s (cP):	
Speed 5 rpm	8,000
Work Life @ 25ºC, Physical worklife by % filler, hours	18
Storage Life @ -40°C (from date of manufacture), year	1
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Cure Schedule

1hour @ 175°C

Alternative Cure Schedule

3 to 5 minute ramp to 175°C + 1 hour @ 175°C (1)

Weight Loss on Cure

10 x 10 mm Si die on glass slide, %	5.3

(1)The ramp was observed to yield reduced bondline voiding and increased strength.

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 , TMA expansion mode:		
Below Tg, ppm/°C		40
Above Tg, ppm/°C		150
Glass Transition Temperature, TMA penetration mode, °C		120
Thermal Conductivity @ 121ºC, C-matic Conductance Tester, W/mK		2.5
Tensile Modulus, DMTA :		
@ -65 °C	N/mm²	4,400
	(psi)	(640,000)
@ 25 °C	N/mm²	3,900
	(psi)	(570,000)
@ 150 °C	N/mm²	2,000
	(psi)	(290,000)
@ 250 °C	N/mm²	300
	(psi)	(44,000)
Extractable Ionic Content, @ 100°C ppm:		
Chloride (Cl-)		<20
Sodium (Na+)		<10
Potassium (K+)		<10
Water Extract Conductivity, mS/m		≤2.0
Weight Loss @ 300ºC , TGA, %		0.35
Moisture Absorption @ Saturation, wt.% @ 85°C/85°RH		0.6

Electrical Properties:

Volume Resistivity, ohm/cm	≤0.0002

TYPICAL PERFORMANCE OF CURED MATERIAL

Die Shear Strength:

2 X 2 mm (80 x 80 mil) Si die on Ag/Cu LF, Kg:	
@ 25ºC	≥8.0
@ 150ºC	≥2.8
3 X 3 mm (120 x 120 mil) Si die:	
Post Cure:	
On Ag/Cu LF, kg-f/die:	
@ 25ºC	21
@ 200ºC	2.9
@ 250ºC	1.7
On Bare Cu LF, kg-f/die:	
@ 25ºC	11
@ 200ºC	2.6
@ 250ºC	1.4
On Pd/Ni/Cu LF, kg-f/die:	
@ 25ºC	27
@ 200ºC	2.4
@ 250ºC	2.0
After 85ºC/85% RH Exposure for 168 hours:	
On Ag/Cu LF, kg-f/die:	
@ 25ºC	12
@ 200ºC	1.8
On Bare Cu LF, kg-f/die:	
@ 25ºC	10
@ 200ºC	2.5
On Pd/Ni/Cu LF, kg-f/die:	
@ 25ºC	23
@ 200ºC	1.8

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Lap Shear Strength	N/mm² (psi)	7.0 (995)

Chip Warpage @ 25ºC vs Chip Size:
0.38 mm thick Si die on 0.2 mm thick Ag/Cu LF:

7.6 x 7.6 mm (300 x 300 mil) chip size, µm	19
10.2 x 10.2 mm (400 x 400 mil) chip size, µm	32
12.7 x 12.7 mm (500 x 500 mil) chip size, µm	51

Chip Warpage vs Post Cure Thermal Process:
3 x 3 mm (120 x 120 mil) Si die:

Post Cure, µm:	
On Ag/Cu LF	20
On Bare Cu LF	22
+Wirebond (1minute @ 250°C), µm:	
On Ag/Cu LF	29
On Bare Cu LF	30
+Post Mold Bake (4hours @ 175°C), µm:	
On Ag/Cu LF	28
On Bare Cu LF	28

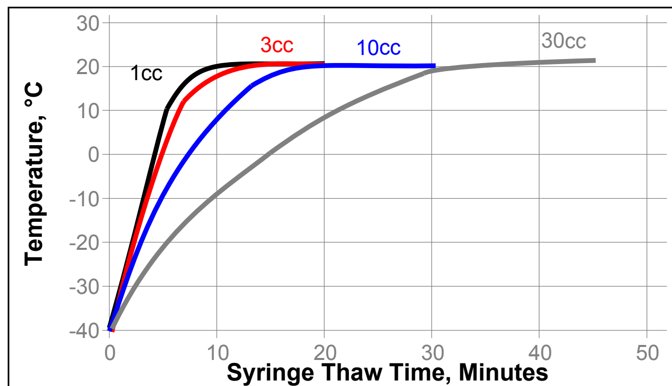
GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be used with chlorine or other strong oxidizing materials.

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 22°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 22°C, the adhesive should not be re-frozen.



DIRECTIONS FOR USE

1. Thawed adhesive should immediately be 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 18 hours.
4. Silver-resin separation may occur if the adhesive is left out at 22°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.

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

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