



ABLESTIK 84 1LMI LED

October 2014

PRODUCT DESCRIPTION

LOCTITE ABLESTIK 84-1LMI LED provides the following product characteristics:

Technology	Epoxy
Appearance	Silver
Cure	Heat cure
pH	6.0
Product Benefits	<ul style="list-style-type: none">• Conductive• Box oven cure• Excellent dispensability, minimal tailing and stringing• Small package size for ease of use
Application	LED Die attach

LOCTITE ABLESTIK 84-1LMI LED electrically conductive die attach adhesive has been formulated for use in high throughput, automated die attach equipment. The rheology of LOCTITE ABLESTIK 84-1LMI LED 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.

LOCTITE ABLESTIK 84-1LMI LED is a highly reliable material packaged in small syringe sizes for convenience.

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 @ 25 °C, Physical worklife by % filler, hours	18
Shelf Life @ -40°C (from date of manufacture), days	365
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Cure Schedule

1 hour @ 175°C

Alternate Cure Schedule

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

⁽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

Glass Transition Temperature, TMA penetration, °C	120
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Coefficient of Thermal Expansion, TMA expansion mode:

Below Tg, ppm/°C	40
Above Tg, ppm/°C	150

Thermal Conductivity @ 121°C, C-matic Conductance Tester, W/(m·K)

2.5

Tensile Modulus, DMTA :

@ -65 °C	N/mm ²	4,400
	(psi)	(640,000)
@ 25 °C	N/mm ²	3,900
	(psi)	(570,000)
@ 150 °C	N/mm ²	2,000
	(psi)	(290,000)
@ 250 °C	N/mm ²	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 @ 300°C, TGA, %

0.35

Moisture Absorption @ Saturation, wt.%,
@ 85°C/85% RH

0.6

Electrical Properties

Volume Resistivity, ohms-cm	≤0.0002
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TYPICAL PERFORMANCE OF CURED MATERIAL

Shear Strength

Die Shear Strength:

2 X 2 mm (80 x 80 mil) Si die on Ag/Cu LF, Kg:

@ 25 °C	≥8.0
@ 150 °C	≥2.8

3 X 3 mm (120 x 120 mil) Si die:

Post Cure:

On Ag/Cu LF, kg-f/die:

@ 25 °C	21
@ 200 °C	2.9
@ 250 °C	1.7

On Bare Cu LF, kg-f/die:

@ 25 °C	11
@ 200 °C	2.6
@ 250 °C	1.4

After 85°C/85% RH exposure for 168 hours:

On Ag/Cu LF, kg-f/die:

@ 25 °C	12
@ 200 °C	1.8

On Bare Cu LF, kg-f/die:

@ 25 °C	10
@ 200 °C	2.5

Lap Shear Strength	N/mm ²	7.0
	(psi)	(995)



Miscellaneous

Chip Warpage vs Post Cure Thermal Process:

0.38 mm thick Si die on 0.2 mm thick Ag/Cu LF:

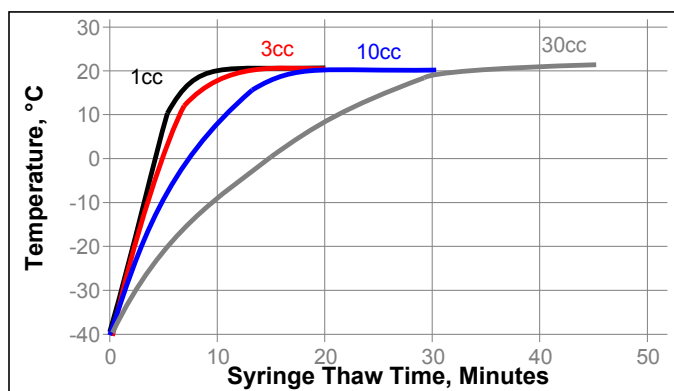
7.6 x 7.6 mm chip size, μm	19
10.2 x 10.2 mm chip size, μm	32
12.7 x 12.7 mm (500 x 500 mil) chip size, μm	51

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. 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.
4. DO NOT re-freeze. Once thawed to 25°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 product's recommended work life.
4. Silver-resin separation may occur if the adhesive is left out at ambient 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 than 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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} = \text{N/mm}^2$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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