Technical Data Sheet

LOCTITE ABLESTIK 8390A

April 2014

PRODUCT DESCRIPTION

LOCTITE ABLESTIK 8390A provides the following product characteristics:

Technology	Epoxy
Appearance	Silver
Cure	Snap Cure and Heat cure
Product Benefits	• Electrically conductive • In-line oven snap cure • Box oven fast cure • Minimal resin bleed • Low condensable volatiles • Moderately stress absorbing • Improved bondline control • Excellent dispensability, minimal tailing and stringing
Application	Die attach
Filler Type	Silver
Substrates	Silver-plated copper leadframes, Palladium-plated copper leadframes and Silver-plated Alloy 42 leadframes
pH	6.2

LOCTITE ABLESTIK 8390A die attach adhesive has been formulated for use in high throughput die attach applications. This high strength adhesive is intended for small to medium size dies.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	≥4.3
Viscosity, Brookfield CP51, 25 °C, mPa·s (cP):	
Speed 5 rpm	9,500
Work Life @ 25°C, hours	24
Shelf Life @ -40°C (from date of manufacture), days	365

TYPICAL CURING PERFORMANCE

Snap Cure Condition

7-Zone Oven:

Temp per zone: 165ºC, 160ºC, 155ºC, 160ºC, 175ºC, 200ºC, 220ºC

Time per zone, seconds	60
N2 Flow, liters/minute	3
N2 Preheat temp, ºC	250

Alternative Cure Schedule

15 minutes @ 175°C

Actual cure duration will vary depending on the heat-up rate of leadframe magazine to 175ºC

Weight Loss on Cure

10 x 10 mm Si die on glass slide, %	0.9

Data generated using alternate cure schedule

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		59
Above Tg, ppm/°C		195
Glass Transition Temperature, TMA penetration mode, °C		80
Thermal Conductivity @ 121°C, W/(m-K)		1.0
Tensile Modulus, DMTA :		
@ -65 °C	N/mm² (psi)	2,700 (390,000)
@ 25 °C	N/mm² (psi)	2,300 (330,000)
@ 150 °C	N/mm² (psi)	210 (30,000)
@ 250 °C	N/mm² (psi)	170 (25,000)
Extractable Ionic Content, @ 100°C ppm:		
Chloride (Cl-)		≤10
Sodium (Na+)		≤10
Potassium (K+)		≤5
Water Extract Conductivity, µmhos/cm		45
Weight Loss @ 300ºC, %		0.3
Moisture Absorption @ Saturation, wt.% @ 85°C/85°RH		0.6

Electrical Properties

Volume Resistivity, ohms-cm	≤0.001

TYPICAL PERFORMANCE OF CURED MATERIAL

Die Shear Strength @ 25ºC:

2 X 2 mm (80 x 80 mil) Si die on Ag/Cu LF	N/mm² (psi)	20 (3,000)

Die Shear Strength @ 25ºC:

Post Cure

2 X 2 mm (80 x 80 mil) Si die on Ag/Cu LF, kg-f/die:	
Snap Cured	18
Oven Cured	15

Die Shear Strength vs Temperature:
Post Cure
3 X 3 mm (120 x 120 mil) Si die, kg-f/die:

@ 25ºC:	
Snap Cured:	
on Ag/Cu substrate	42
on Bare Cu substrate	41
on Pd/Ni/Cu substrate	40
Oven Cured:	
on Ag/Cu substrate	37
@ 200ºC:	
Snap Cured:	
on Ag/Cu substrate	1.8
on Bare Cu substrate	5.5
on Pd/Ni/Cu substrate	4.7
Oven Cured:	
on Ag/Cu substrate	3.7
@ 250ºC:	
Snap Cured:	
on Ag/Cu substrate	1.2
on Bare Cu substrate	3.2
on Pd/Ni/Cu substrate	2.9
Oven Cured:	
on Ag/Cu substrate	1.5

Die Shear Strength after 85°C/85% RH exposure for 168hours:
Post Cure
3 X 3 mm (120 x 120 mil) Si die, kg-f/die:

@ 25ºC:	
Snap Cured:	
on Ag/Cu substrate	17
on Bare Cu substrate	19
on Pd/Ni/Cu substrate	26
Oven Cured:	
on Ag/Cu substrate	23
@ 200ºC:	
Snap Cured:	
on Ag/Cu substrate	1.0
on Bare Cu substrate	1.3
on Pd/Ni/Cu substrate	14
Oven Cured:	
on Ag/Cu substrate	13

Chip Warpage @ 25ºC vs Chip Size:
Post Cure

7.6 x 7.6 mm (300 x 300 mil), 0.38 mm (15 mil) thick Si die, µm:	
on 0.2 mm thick Ag/Cu LF:	
Snap Cured	15
Oven Cured	16
10.2 x 10.2 mm (400 x 400 mil), 0.38 mm (15 mil) thick Si die, µm:	
on 0.2 mm thick Ag/Cu LF:	
Snap Cured	35
Oven Cured	35
12.7 x 12.7 mm (500 x 500 mil), 0.38 mm (15 mil) thick Si die, µm:	
on 0.2 mm thick Ag/Cu LF:	
Snap Cured	56
Oven Cured	55

Chip Warpage vs Post Cure Thermal Process:

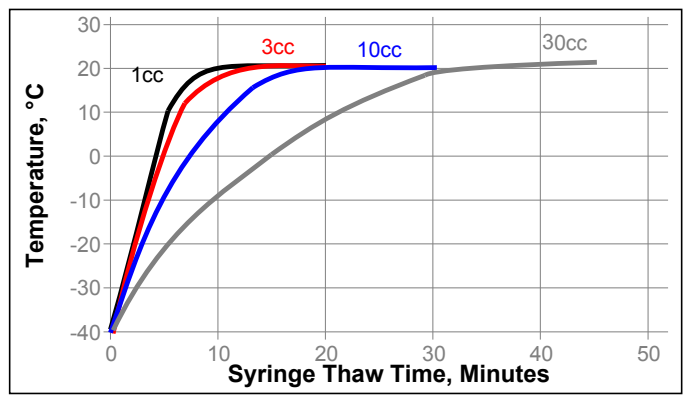
7.6 x 7.6 mm (300 x 300 mil), 0.38 mm (15 mil) thick Si die, µm:	
on 0.2 mm thick Ag/Cu LF:	
Post Cure:	
Snap Cured	15
+ Wirebond (1 minute @ 250°C):	
Snap Cured	17
+ Post Mold Bake (4 hours @ 175°C):	
Snap Cured	17

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 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 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 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
(°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 = N/mm²
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

Disclaimer
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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