Technical Data Sheet

LOCTITE ABLESTIK 8390

April 2014

PRODUCT DESCRIPTION

LOCTITE ABLESTIK 8390 provides the following product characteristics:

Technology	Epoxy
Appearance	Silver
Cure	Heat cure
Product Benefits	• Minimal resin bleed • Thermally conductive • Electrically conductive • In-line oven snap cure • Low condensable volatiles • Moderately stress absorbing • Compatible for use with palladium • 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 8390 die attach adhesive has been formulated for use in high throughput die attach applications. It is suitable for die sizes up to 8 x 8 mm.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	≥3.1
Viscosity, Brookfield CP51, 25 °C, mPa·s (cP):	
Speed 5 rpm	8,700
Work Life @ 25°C, hours	48
Shelf Life @ -40°C (from date of manufacture), days	365

TYPICAL CURING PERFORMANCE

Snap Cure Condition

7-Zone Oven

Temp per zone: 160ºC, 150ºC, 155ºC, 155ºC, 160ºC, 175ºC, 220ºC

Total Time , seconds	80
N2 Flow, liters/minute	2.5
N2 Preheat temp, ºC	230 to 250

Alternative Cure Schedule

15 minutes @ 175°C

Weight Loss on Cure

10 x 10 mm Si die on glass slide, %	1

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		60
Above Tg, ppm/°C		135
Glass Transition Temperature (Tg) by TMA, °C		73
Thermal Conductivity @ 121°C, W/(m-K)		1.8
Tensile Modulus, DMTA :		
@ -65 °C	N/mm² (psi)	6,330 (920,000)
@ 25 °C	N/mm² (psi)	4,650 (675,000)
@ 150 °C	N/mm² (psi)	1,390 (200,000)
@ 250 °C	N/mm² (psi)	517 (75,000)
Extractable Ionic Content, @ 100°C ppm:		
Chloride (Cl-)		<20
Sodium (Na+)		<10
Potassium (K+)		<5
Water Extract Conductivity, µmhos/cm		18
Weight Loss @ 300ºC, %		0.6
Moisture Absorption @ Saturation, wt.% @ 85°C/85°RH		1.1

Electrical Properties

Volume Resistivity, ohms-cm	≤0.0008

TYPICAL PERFORMANCE OF CURED MATERIAL

Miscellaneous

Die Shear Strength:

2 x 2 mm Si die on Ag/Cu LF, kg-f:

@ 25ºC	11

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

Snap Cured:	
On Ag/Cu LF:	
@ 25°C	17
@ 200ºC	1.0
On Bare Cu LF:	
@ 25ºC	10
@ 200°C	1.1
On Pd/Ni/Cu LF:	
@ 25ºC	18
@ 200°C	1.3
Oven Cured:	
On Ag/Cu LF:	
@ 25ºC	14
@ 200°C	3.0

Die Shear Strength vs Temperature:

3 X 3 mm Si die, kg-f :

Snap Cured:	
On Ag/Cu LF:	
@ 25°C	20
@ 200ºC	2.4
@ 250°C	1.2
On Bare Cu LF:	
@ 25°C	13
@ 200°C	3.0
@ 250ºC	2.7
On Pd/Ni/Cu LF:	
@ 25ºC	18
@ 200°C	3.5
@ 250°C	1.8
Oven Cured:	
On Ag/Cu LF:	
@ 25ºC	24
@ 200°C	4.8
@ 250°C	3.1

Lap Shear Strength:

30 minutes @ 150°C	N/mm² (psi)	9.0 (1,300)

Chip Warpage vs Chip Size:

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

Snap Cured:	
7.6 x 7.6 mm chip size	11
10.2 x 10.2 mm chip size	29
12.7 x 12.7 mm chip size	52
Oven Cured:	
7.6 x 7.6 mm chip size	22
10.2 x 10.2 mm chip size	44
12.7 x 12.7 mm chip size	68

Chip Warpage vs Post Cure Thermal Process:

7.6 x 7.6 x 0.38 mm Si die on 0.2 mm thick leadframe, µm:

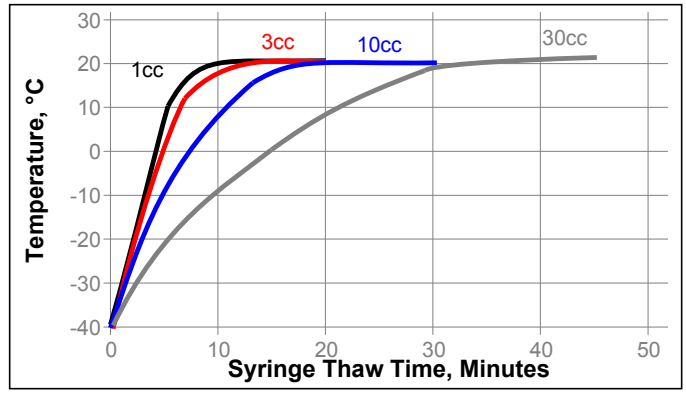
on Ag/Cu LF:	
Post Cure	11
Plus Wirebond (1 minute @ 250°C)	29
Plus Post Mold Bake (4 hours @ 175°C)	52
on Bare Cu LF:	
Post Cure	22
Plus Wirebond (1minute @ 250)	44
Plus Post Mold Bake (4hours @ 175°C)	68

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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