

# LOCTITE ECCOBOND UF 3810

November 2016

## PRODUCT DESCRIPTION

LOCTITE ECCOBOND UF 3810 provides the following product characteristics:

<b>Technology</b>	Epoxy
<b>Appearance</b>	Black liquid
<b>Product Benefits</b>	<ul style="list-style-type: none"> <li>• One component</li> <li>• Fast cure at moderate temperatures</li> <li>• High Tg</li> <li>• Halogen free</li> <li>• Compatible with most Pb-free solders</li> <li>• Stable electrical performance in temperature humidity bias</li> <li>• Reworkable</li> <li>• Room temperature flow capability</li> </ul>
<b>Cure</b>	Heat cure
<b>Application</b>	Underfill
<b>Typical Package Application</b>	Chip scale packages and BGA

LOCTITE ECCOBOND UF 3810 reworkable epoxy underfill is designed for CSP and BGA applications. It cures quickly at moderate temperatures to minimize stress to other components. When cured, this material provides excellent mechanical properties to protect solder joints during thermal cycling.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Cone & Plate, @ 25 °C , mPa·s (cP):	
@ 20 s <sup>-1</sup>	394
Specific Gravity,	1.13
Work Life @ 25°C, (25% increase in viscosity), days	3
Shelf Life @ -20°C (from date of manufacture), days	365
Flash Point - See SDS	

## TYPICAL CURING PERFORMANCE

### Cure Schedule

≥8 minutes @ 130°C

The above cure profile is a guideline recommendation. 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, ppm/°C:	
Below Tg	55
Above Tg	171
Glass Transition Temperature (Tg) by TMA, °C	102

### Storage Modulus, DMA:

@ -65 °C	N/mm <sup>2</sup>	3,820
	(psi)	(475,723)
@ 25 °C	N/mm <sup>2</sup>	2,990
	(psi)	(435,000)
@ 100 °C	N/mm <sup>2</sup>	850
	(psi)	(123,282)
@ 200 °C	N/mm <sup>2</sup>	30
	(psi)	(4,351)

Thermal Conductivity , Laser Flash, W/(m·K) 0.29

Extractable Ionic Content, DI water, 1 hour @ 85 °C:

Sodium (Na <sup>+</sup> )	0.7
Chloride (Cl <sup>-</sup> )	0.8
Magnesium (Mg <sup>2+</sup> )	N.D.
Calcium (Ca <sup>2+</sup> +)	5
Potassium (K <sup>+</sup> )	N.D.
Ammonium (NH <sub>4</sub> <sup>+</sup> )	0.7
Nitrate (NO <sub>3</sub> )	N.D.
Phosphite (PO <sub>3</sub> )	N.D.
Sulfate (SO <sub>4</sub> <sup>2-</sup> )	N.D.
Bromide (Br <sup>-</sup> )	N.D.

## Electrical Properties

Dielectric Constant @ 23°C :

@ 1GHz	3.44
@ 2GHz	2.87

Dissipation Factor @ 23°C:

@ 1GHz	0.0071
@ 2GHz	0.0037

## TYPICAL PERFORMANCE OF CURED MATERIAL

Lap Shear Strength , ISO 4587:

Glass Epoxy to Glass Epoxy	N/mm <sup>2</sup>	9.7
	(psi)	(1,400)

## GENERAL INFORMATION

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

### THAWING:

1. Thaw 30 cc syringes at least 1 hour at room temperature prior to use.
2. Allow container to reach room temperature before use.
3. After removing from the freezer, set the syringes to stand vertically while thawing.
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 25°C, the adhesive should not be re-frozen.

**DIRECTIONS FOR USE**

1. Thawed material 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.

**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: -20°C. Storage below -40°C or greater than -15°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**

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

**Disclaimer****Note:**

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