

LOCTITE ECCOBOND UF 3820

September 2018

PRODUCT DESCRIPTION

LOCTITE ECCOBOND UF 3820 provides the following product characteristics:

Technology	Epoxy
Appearance	Black liquid
Cure	Heat cure
Product Benefits	• High Tg • Easy rework • Halogen free • One component • Fast cure at moderate temperatures • Room temperature flow capability • High fracture toughness • Excellent thermal cycle performance • Compatible with most Pb-free solders • Stable electrical performance under thermal/humidity bias
Application	Underfill
Typical Package Application(s)	CSP, WLCSP and BGA

LOCTITE ECCOBOND UF 3820 reworkable underfill is specially designed for CSP, WLCSP and BGA applications. It is formulated to cure quickly at moderate temperatures to minimize stress to other components. This material's high glass transition temperature and high fracture toughness enables excellent protection of solder joints during thermal cycling.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield CP50-1, 25 °C, mPa·s (cP):	
@ Shear rate of 1,000 s ⁻¹	340
Thixotropic Index	1.1
Specific Gravity, Pycnometer, g/ml	1.24
Work Life @ 25°C, 25% change in viscosity, day	1
Shelf Life, days:	
@ -40°C	180
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Cure Schedule

10 minutes @ 130°C

Alternate Cure Schedule

5 minutes @ 150°C or

3 minutes @ 160°C

The above cure profile is a guideline recommendation. These cure conditions (time and temperature) may vary based on customers' experience and specific application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Glass Transition Temperature (Tg) by TMA, °C 133

Coefficient of Thermal Expansion, , TMA:

Below Tg, ppm/°C 51

Above Tg, ppm/°C 172

Storage Modulus, DMA:

@ 25°C	N/mm ²	2,560
	(psi)	(371,300)
@ 100°C	N/mm ²	2,070
	(psi)	(300,230)
@ 150°C	N/mm ²	50
	(psi)	(7,105)
@ 200°C	N/mm ²	25
	(psi)	(3,625)

Fracture Toughness K1c, Instron, MPa(m^{1/2}) 1.5

Electrical Properties

Dielectric Constant / Dissipation Factor:

@ 850 MHz	2.94/0.048
@ 1575 MHz	3.02/0.052
@ 2500 MHz	2.96/0.047
@ 5000 MHz	2.93/0.052

TYPICAL PERFORMANCE OF CURED MATERIAL

Shear Strength

PCB to PCB	N/mm ²	10.9
	(psi)	(1,581)

GENERAL INFORMATION

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

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.
5. Typical thaw times are listed as follows:
 - 1 hour for 10 cc syringes
 - 1.5 hours for 30 cc syringes
 - 4 to 5 hours for 6-ounce cartridges

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 : -45 to -35 °C

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 Henkel Representative.

Conversions

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

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Reference 0.4