

LOCTITE ECCOBOND FP4546

May 2020

PRODUCT DESCRIPTION

LOCTITE ECCOBOND FP4546 provides the following product characteristics:

Technology	Epoxy
Appearance	Black liquid
Product Benefits	<ul style="list-style-type: none"> • High purity • Low coefficient of thermal expansion • Improved toughness
Cure	Heat cure
Application	Encapsulation, Semiconductor Underfill
Typical Package Application(s)	Flip chip devices

LOCTITE ECCOBOND FP4546 liquid epoxy encapsulant is specially suited for use on flip-chip devices requiring improved crack/fracture resistance. When fully cured, the material forms a rigid, low stress seal that dissipates stress on solder joints and extends thermal cycling performance.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield - Cone & Plate, CP52, 25 °C, mPa·s (cP):

@ Speed 20 rpm	12,000
Filler Content, % Ignition	60
Flow Rate @ 90 °C, 3 mil gap, 500 mil flow, seconds	30
Pot Life @ 25 °C (time to double viscosity), hours	32
Gel Time @ 121°C, minutes	10
Shelf Life @ -40°C, days	270

Flash Point - See SDS

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

30 minutes @ 165°C

Alternate Cure Schedule

90 minutes @ 150°C

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 Linear Thermal Expansion, Sample cured 7 min @ 160°C :

Below Tg, ppm/°C 35

Above Tg, ppm/°C 100

Glass Transition Temperature (Tg), °C 130

Flexural Modulus N/mm² (psi) 7,500 (1.09×10⁶)

Extractable Ionic Content, ppm:

Chloride (Cl-) 20

Sodium (Na+) 5

GENERAL INFORMATION

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

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

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.

THAWING:

1. Frozen packages must be completely thawed before use.
2. Warm at room temperature until no longer cool to the touch (normally 60 to 90 minutes).
3. DO NOT thaw in an oven.

Directions for use

1. To encapsulate flip chips by capillary action, the chip and substrate must be thoroughly cleaned.
2. A bead of LOCTITE ECCOBOND FP4546 is then applied to one or two sides (L-shape) of the chip perimeter.
3. For best results, the material should be dispensed onto a substrate that has been preheated to approximately 100 to 120°C and held at that temperature until flow stops.

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

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

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

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Reference 1