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LOCTITE

Technical Data Sheet

LOCTITE ECCOBOND FP4546

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PRODUCT DESCRIPTION

LOCTITE ECCOBOND FP4546 provides the following product characteristics:

Technology	Epoxy
Appearance	Black liquid
Product Benefits	• 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 @ 121ºC, 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 (1.09×10^6)
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.

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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
(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
N x 0.225 = lb/F
N/mm x 5.71 = lb/in
psi x 145 = N/mm²
MPa = N/mm²
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. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

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Reference 1

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