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LOCTITE

Technical Data Sheet

LOCTITE ECCOBOND FP4545FC

August 2019

PRODUCT DESCRIPTION

LOCTITE ECCOBOND FP4545FC provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Product Benefits	• High purity • Forms a rigid, low stress seal • Low CTE • Good toughness • Improved toughness
Filler Weight, %	55
Components	One-component
Cure	Heat cure
Application	Underfill
Typical Applications	Flip Chip

LOCTITE ECCOBOND FP4545FC epoxy encapsulant designed as underfill and helps dissipate stress on solder joints and extends thermal cycling performance. This material is specially suited for flip-chip devices requiring improved crack/fracture resistance and noclean flux compatibility.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield - Cone & Plate, 25 °C, mPa·s (cP):	
cp #52, Speed 20, rpm	6,500
Rheology @ 90 °C,	1.5
Pot life@ 25°C, hours:	
(Time required to double viscosity)	12
Gel Time @ 121 °C, minutes	16
Shelf Life @ -40°C, days	274
Flow Rate @ 100°C, seconds 500mil travel, 3mil gap	30
Specific Gravity	1.6
Work Life, hours	8
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

60 minutes @ 165°C

Alternate Cure Schedule

120 minutes @ 170°C
(Enhanced Performance)

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, ppm/°C:		
Below Tg		28
Above Tg		100
(Cured 120 minutes @ 165ºC)		
Glass Transition Temperature(Tg), °C		120
Flexural Modulus , ASTM D790	N/mm²	7,100
	(psi)	(1,029,500)
Extractable Ionic Content, :		
Chloride (Cl-)		20
Sodium (Na+)		5

TYPICAL ENVIRONMENTAL RESISTANCE

Outgassing Properties

Outgassing , NASA Outgassing:	
TML, %	0.23
CVCM, %	<0.01
WVR, %	0.17

GENERAL INFORMATION

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

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. Store tip down and warm at room temperature until no longer cool to the touch (normally 60 to 90 minutes).
2. Frozen packages must be completely thawed before use.
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. 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.
3. Devices with wet encapsulant should not be exposed to humidity in the air.
4. If the material cannot be initially gelled to a hard finish within 1 hour after dispensing, storage in desiccator cabinet is suggested until full curing is possible.
5. A bead of LOCTITE ECCOBOND FP4545FC is then applied to one or two sides (L-shape) of the chip perimeter.

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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.
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