

LOCTITE ECCOBOND UF 4550HTC

August 2021

PRODUCT DESCRIPTION

LOCTITE ECCOBOND UF 4550HTC provides the following product characteristics:

Technology	Epoxy
Color	Off white liquid
Filler Type	Alumina
Filler Weight, %	75
Product Benefits	• Thermally conductive • High TG, low CTE • Low ionics • Fast flow • Fast cure @ 160°C • Jet dispensable
Cure	Heat cure
Application	Underfill
Typical Package Application(s)	• High thermal applications • Flip chip devices • Flexible circuits

LOCTITE ECCOBOND UF 4550HTC is a board level capillary underfill designed to provide enhanced thermal properties and adhesion to integrated circuit passivation material and flex circuits. LOCTITE ECCOBOND UF 4550HTC is designed to quickly underfill at elevated substrate temperature of 90 to 110°C. LOCTITE ECCOBOND UF 4550HTC provides thermal conductivity for applications where thermal management is required. This material is also engineered to provide good thermal cycle reliability for PCBAs.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield - Cone & Plate CP51, 25 °C, mPa·s (cP):

@ Speed 0.5 rpm	12,000
@ Speed 5.0 rpm	13,800

Thixotropic Index (0.5/5.0 rpm) 0.9

Specific Gravity, Pycnometer 2.47

Flow Rate @ 100°C, , mm:

@ 2 mil gap, 12 mm wide, 15 seconds 6

Shelf Life @ -40°C (from date of manufacture), days 271

Work Life @ 25°C, hours 12

Flash Point - See SDS

TYPICAL CURING PERFORMANCE**Cure Schedule**

15 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**

Coefficient of Thermal Expansion, TMA:

Below Tg, ppm/°C 23

Above Tg, ppm/°C 102

Glass Transition Temperature (Tg) by TMA, °C 143

Flexural Modulus, DMA, single cantilever:

@ 25°C	N/mm ²	10,100
	(psi)	(1.46×10 ⁶)
@ 250°C	N/mm ²	178
	(psi)	(25,800)

Moisture Absorption, 85°C/85% RH, % 0.5

Extractable Ionic Content, 24 hours @ 100°C, ppm:

Sodium (Na+) 1

Potassium (K+) <0.5

Chloride (Cl-) 8

Thermal Conductivity, Laser Flash, W/(m·K) 1.2

Adhesive Properties

Die Shear Strength, Dage Tester, kg-f:

120 x 120 mil die on Si/BT:

@ 25 °C	43
@ 260 °C	2.8

GENERAL INFORMATION

Please consult the Safety Data Sheet (SDS) for safe handling information of this product.

DIRECTIONS FOR USE

1. Allow material to thaw @ 25°C for at least 45 minutes
2. For best flow rates, a preheat temperature of 90 to 110 °C is recommended.

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. Storage below minus (-)40 °C or greater than minus (-)40 °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 Henkel Representative.

Conversions

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

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local Henkel representative for assistance and recommendations on the specifications of this product.

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