

LOCTITE[®] ECCOBOND EN 4539

October 2021

PRODUCT DESCRIPTION

LOCTITE[®] ECCOBOND EN 4539 provides the following product characteristics:

Technology	Epoxy
Appearance	Black liquid
Product Benefits	<ul style="list-style-type: none"> • Good flow performance • Good stability during shipping, storage and use • Good bending flexibility
Cure	Heat cure
Application	Electronic Encapsulants, Semiconductor Encapsulant
Typical Package Application(s)	CSP, BGA, Flip Chip BGA

LOCTITE[®] ECCOBOND EN 4539 flexible encapsulant is formulated to cure at low temperatures. It provides good flow and bending flexibility making this material ideal for FPS device assembly applications.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield CP51, 25 °C, mPa·s (cP):	
@ Speed 20 rpm	6,900
Thixotropic Index (2/20 rpm)	1.25
Work Life @ 25°C, hours	24
Shelf Life @ -40°C (estimated), days	270

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

- 60 minutes @ 100°C or
- 30 minutes @ 130°C

The above cure profile(s) are guideline recommendation(s). These 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

Sample cured 30 minutes @ 130°C

Physical Properties

Hardness, Shore D	87
Glass Transition Temperature (Tg) by TMA, °C	135

Coefficient of Thermal Expansion, ppm/°C:

Below Tg	25
Above Tg	97

Storage Modulus, DMA, @ 25°C, N/mm² 7,513

Adhesion Properties

Shear Strength @ 25°C:	
2 x 2 mm Si die on PCB, kg-f	11.1

GENERAL INFORMATION

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

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 re-freeze. Once thawed, the adhesive should not be re-frozen.

DIRECTIONS FOR USE

1. Bonding surfaces should be clean of contaminants such as paint, dirt, oil or other foreign matter.

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 -40°C or above -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.

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.



Conversions

$$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$$

$$\text{kV/mm} \times 25.4 = \text{V/mil}$$

$$\text{mm} / 25.4 = \text{inches}$$

$$\text{N} \times 0.225 = \text{lb/F}$$

$$\text{N/mm} \times 5.71 = \text{lb/in}$$

$$\text{psi} \times 145 = \text{N/mm}^2$$

$$\text{MPa} = \text{N/mm}^2$$

$$\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$$

$$\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$$

$$\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$$

$$\text{mPa}\cdot\text{s} = \text{cP}$$

Disclaimer

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Reference 1