Technical Data Sheet

LOCTITE® ECCOBOND UF 9000AE

February 2024

PRODUCT DESCRIPTION

LOCTITE® ECCOBOND UF 9000AE provides the following product characteristics:

Technology	Epoxy
Appearance	Black liquid
Product benefits	• High purity • Low CTE • Low die warpage • Good flow • Self-filleting • Optimized viscosity and modulus • Low resin bleed out (RBO) performance • 260°C reflow capability for Pb-free, low-k applications
Cure	Heat cure
Application	Semiconductor underfill; Electronic encapsulant
Typical application	Flip chip BGA and Cu pillar

LOCTITE® ECCOBOND UF 9000AE liquid epoxy underfill encapsulant is designed for large die flip chip BGA and Cu pillar package applications requiring low thermal expansion, fast capillary flow and long worklife.

When fully cured, LOCTITE® ECCOBOND UF 9000AE forms a rigid, self-filleting, protective seal that dissipates stress in solder joints extending electrical, thermal and moisture reliability performance.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield, CP 51, 25°C, mPa.s (cP)	
Speed 5 rpm	9,082
Thixotropic index (0.5/5 rpm)	0.85
Specific gravity @ 25°C	1.71
Pot life @ 25°C, hours	24
Shelf life @ -40°C, days	180

TYPICAL CURING PERFORMANCE

Recommended cure condition

15 minute ramp to 100°C; 90 minute hold @ 100°C
+ 15 minute ramp from 100°C to 165°C; 2 hour hold @ 165°C

The above cure profiles are guideline recommendations. 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

Physical properties

Coefficient of thermal expansion, ppm/°C:	
Below Tg	23
Above Tg	85
Glass transition temperature, °C	
by DMA	111
by TMA	112
Storage modulus, DMA, N/mm^2	
@25ºC	13,500
@250ºC	136

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. Thaw times are listed as follows:

   10 cc syringes = 1 hour
   30 cc syringes = 1.5 hours
   55 cc syringes = 2 to 3 hours
   6 oz cartridges = 4 to 5 hours

4. DO NOT open the container before contents reach 25°C temperature. Any moisture that collects on the thawed container should be removed prior to opening the container.
5. DO NOT re-freeze. Once thawed to 25°C, the adhesive should not be re-frozen.

Directions for use

1. While not essential, the underfill area should be cleaned of contaminants and obstructions to optimize the speed and quality of the underfill.
2. Thawed adhesive should be immediately placed on dispense equipment for use.
3. For best performance, adhesive should be completely used within the product's recommended work life.
4. The substrate should be pre-heated prior to dispensing to ensure even underfill flow under the die. The preheating time depends on the thermal mass and the heating method. Using a thermocouple to measure the actual temperature on top of the substrate near the dispense area is recommended. The recommended substrate temperature is typically 90 to 100°C.
5. The underfill volume depends on several factors including die size, gap height, bump density, and fillet height. Dispense pattern will primarily depend on bump layout and die size. Dispensing optimization may be necessary to produce void-free parts. A 60-80% line (1 to 3 passes) centered along the die size is generally recommended.
6. Minimal delay time between passes is recommended to avoid underfill overflow on top of the die (0 to 20 seconds). The recommended needle size is typically 22 to 25 gauge.

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 greater than -15°C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel 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 quality department for assistance and recommendations on the specifications of this product.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

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