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LOCTITE

Technical Data Sheet

LOCTITE ECCOBOND E 1216M

March 2019

PRODUCT DESCRIPTION

LOCTITE ECCOBOND E 1216M provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Cure	Heat cure
Product Benefits	• Snap curable • Fast, void-free underfill of area array devices • Excellent stability during shipping, storage and use • Excellent adhesion and strength • Non-anhydride curing chemistry • Passes NASA outgassing
Application	Underfill
Typical Package Application	CSP, BGA and Flip Chip BGA

LOCTITE ECCOBOND E 1216M innovative capillary flow underfill is designed for high volume assembly operations requiring a very fast flowing underfill that fully cures in a single reflow cycle, but is stable enough to be easily shipped and used in large volume cartridges (up to 20 oz).

It is specifically formulated to eliminate anhydride-type curing agents for those users who prefer to work with anhydride-free products.

LOCTITE ECCOBOND E 1216M passes NASA outgassing standards.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield , mPa·s (cP):	
Spindle 4, speed 20 rpm	4,000
Flow Rate @ 80°C, seconds:	
@ 1cm travel, 200µm gap	9
Specific Gravity	1.4
Work Life @ 25°C, (50% increase in viscosity), days	5
Shelf Life @ -20°C, days	365

Flash Point - See SDS

TYPICAL CURING PERFORMANCE

Cure Schedule

Snap or Inline Cure	3 minutes @ 165°C
Fast Cure	4 minutes @ 150°C
Low Temperature Cure	10 minutes @ 130°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

Hardness, Shore D @ 25ºC:		
Sample cured 5 minutes @ 160ºC		86
Coefficient of Thermal Expansion, ppm/ºC:		
Below Tg		35
Above Tg		131
Glass Transition Temperature (Tg) by TMA, °C		125
Thermal Conductivity , Laser Flash, W/(m-K)		0.42
Flexural Modulus, 3-point bend test:		
@ -65°C	N/mm² (psi)	7,380 ($1.07\times10^{+6}$)
@ 25°C	N/mm² (psi)	6,010 (872,000)
@ 100°C	N/mm² (psi)	3,830 (555,000)
@ 150°C	N/mm² (psi)	192 (27,800)
@ 200°C	N/mm² (psi)	126 (18,300)
@ 250°C	N/mm² (psi)	106 (15,400)

Electrical Properties

Dielectric Constant / Dissipation Factor @ 23°C:	
@ 1MHz	2.5/0.0118
Volume Resistivity, ohm-cm	$2.82\times10^{+16}$
Surface Resistivity, ohm	$1.09\times10^{+14}$
Dielectric Strength, kV/mm	42

GENERAL INFORMATION

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

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 for 4 hours (6, 12, or 20oz cartridges) prior to use.

DIRECTIONS FOR USE

1. While it is not essential, the underfill area should be cleaned of contaminants and obstructions to optimize the speed and quality of the underfill
2. Preheat assembly to between 70°C and 100°C. Higher temperatures reduce underfill times. Preheat assembly to 100°C for best results.
3. Use the graph below to determine the estimated underfilling time for your desired assembly preheat temperature.
4. Dispense a bead of the underfill using a syringe fitted with a 21 gauge needle (or larger) on one (line) or two sides (L-Shape) of the device perimeter
5. Syringe tip heating is not needed, but can be used
6. Very large devices may require multiple beads of underfill, but for

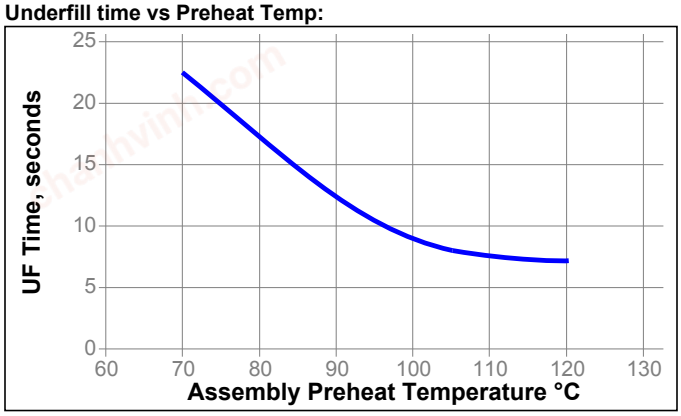
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most no second or 'fillet pass' is required

7. Because of its low viscosity and outstanding wetting characteristics, LOCTITE ECCOBOND E 1216M is designed to 'self-fillet' the opposite sides of the device

Underfill time vs Preheat Temp:



Note: Use for estimate only. Data generated on Glass to Glass slide assembly with 180 micron gap, time is to flow a distance of 1 cm.

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.

STORAGE:
Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage : -20 °C. Storage temperature greater than -15°C can adversely affect product properties. Although product is shipped with dry ice and will see temperatures of less than -20°C, this will not impact product performance.

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
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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