

LOCTITE ECCOBOND E 1172 A

September 2012

PRODUCT DESCRIPTION

LOCTITE ECCOBOND E 1172 A provides the following product characteristics:

Technology	Epoxy
Appearance	Tan
Cure	Heat cure
Product Benefits	<ul style="list-style-type: none"> • One component • Fast cure at low temperatures • Low cure temperature • Void-free underfill • Low CTE • Non-anhydride curing chemistry • Long pot life
Application	Underfill
Filler Weight, %	65 to 68
Typical Package Application	Flip chip devices

LOCTITE ECCOBOND E 1172 A is formulated for use with very fine area array devices where SMT transparent processing is critical. This material can underfill devices with 25 micron geometries. LOCTITE ECCOBOND E 1172 A provides a uniform and void-free encapsulant underfill, maximizing the device's temperature cycling capability, distributing stress away from solder connects.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield, mPa·s (cP):	
Spindle 3, speed 5 rpm	17,000
Particle Size, Maximum, μm	20
Density, g/cm ³	1.68
Flow Rate @ 100°C, seconds:	
1 cm travel on Glass	
@ 25 micron gap	25
@ 50 micron gap	25
@ 100 micron gap	16
:	
@ 25 micron gap	25
@ 50 micron gap	25
@ 100 micron gap	16
Pot Life @ 25°C, hours	48
Shelf Life:	
@ -40°C, days	183
@ -20°C, days	91
@ 25°C, hours	48
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Cure Schedule

Standard Cure

6 minutes @ 135°C

Fast Cure

3 minutes @ 150°C

Low Stress Cure

30 minutes @ 100 °C plus 5 minutes @ 135 °C

Shrinkage on Cure

Cure Shrinkage, %	0.47
-------------------	------

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

Sample cured 30minutes @ 120°C

CTE and Tg information obtained from first run sample exposure using a TMA

Physical Properties

Coefficient of Linear Thermal Expansion, ppm/°C	27
Glass Transition Temperature (Tg), °C	135
Extractable Ionic Content, ppm:	
Chloride (Cl-)	<35
Sodium (Na+)	<15
Potassium (K+)	<10
Hardness, Shore D	≥90
Water Absorption, 24-hr boil, %	1.5

Electrical Properties

Volume Resistivity, ohms-cm	1×10 ¹⁵
Dielectric Constant/Dissipation Factor @ 1 MHz	3.52/0.0042

GENERAL INFORMATION

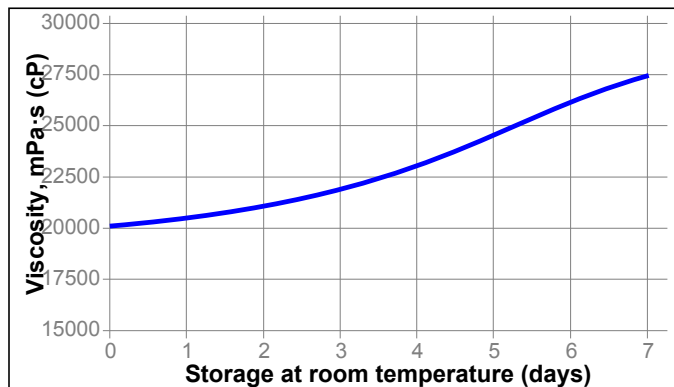
For safe handling information on this product, consult the Safety Data Sheet, (SDS).

THAWING:

1. After removing from the freezer, set the syringes to stand vertically while thawing.
2. Syringes should thaw a minimum of 60 minutes.

DIRECTIONS FOR USE

1. Preheat assembly to between 90°C and 120°C. Higher temperatures reduce underfill times.
2. Dispense a bead of the underfill using a syringe fitted with a 23 gauge needle (or larger) on one (line) or two sides (L-Shape) of the device perimeter.
3. Hold at temperature for capillary flow to occur.
4. Very large devices may require multiple beads of underfill, but for most no second or 'fillet pass' is required.

Worklife:**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 : -40 to -20 °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

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

Disclaimer**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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:

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. 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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada, Inc. the following disclaimer is applicable:

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion

herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 1