

LOCTITE ECCOBOND FP4527

November 2018

PRODUCT DESCRIPTION

LOCTITE ECCOBOND FP4527 provides the following product characteristics:

Technology	Epoxy
Appearance	Blue liquid
Product Benefits	• Low viscosity • High flow • Excellent wettability
Cure	Heat cure
Application	Semiconductor, Underfill
Typical Applications	Encapsulant for flip chip devices

LOCTITE ECCOBOND FP4527 is a low viscosity, high flow, epoxy based material designed for capillary underfill on flip chip applications.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Cone & Plate, @ 25 °C cP:

Spindle 52, speed 10 rpm	12,000
Filler Content %	68
Particle Size, laser diffraction, µm	12
Pot Life @ 25 °C, days	2
Shelf Life @ -40°C, days	274
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE**Recommended Cure Schedule**

- 15 minutes @ 165°C on hot plate
- 30 minutes @ 165°C in Convection oven

Alternate Cure Schedule

- 1 hour @ 110°C plus 30 minutes @ 150°C in Convection oven

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**Physical Properties :**

Coefficient of Thermal Expansion, ppm/°C:

Below Tg	26
Above Tg	87

Glass Transition Temperature (Tg), °C:

(Tg) by TMA	158
(Tg) by DSC	140

Glob Height, 0.2 gram mass, mm	2
Linear Shrinkage, %	0.135
Extractable Ionic Content, (Material cured 30 minutes @ 165°C, is a 20 hour Parr Bomb extraction in water):	
Chloride (Cl-), ppm	5
Sodium (Na+), ppm	5

Moisture Absorption, 300 hours PCT, %	1.5
Flexural Modulus	GPa 10.3 (N/mm ²) (10,300) (psi) (1.49×10 ⁶)

Elongation @ break, %	1.39
Modulus @ 23°C	GPa 5.5 (N/mm ²) (5,500) (psi) (798,000)

TYPICAL PERFORMANCE OF CURED MATERIAL**Miscellaneous:**

Flexural Strength, 3 points bend, psi	17,000
Tensile Strength @ 23°C, psi	10,000

GENERAL INFORMATION

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

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.

THAWING:

1. Frozen packages must be completely thawed before use.
2. DO NOT thaw in an oven.

Directions for use

1. Allow material to reach room temperature before use.
2. For best results in dispensing, a 21 gauge needle should be used with approximately 10 psi pressure.
3. Optimum preheat temperature for the part is 90 to 100°C.

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

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 2