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LOCTITE

Technical Data Sheet

# LOCTITE ECCOBOND FP4531

March 2019

## PRODUCT DESCRIPTION

LOCTITE ECCOBOND FP4531 provides the following product characteristics:

| | |
|---|---|
| **Technology** | Epoxy |
| Appearance | Black |
| Product Benefits | • Snap curable<br>• Fast flow<br>• Passes NASA outgassing |
| **Cure** | Heat cure |
| **Application** | Underfill |
| Typical Applications | Flex applications |

LOCTITE ECCOBOND FP4531 underfill is designed for flip chip on flex applications with a 1mil gap.

LOCTITE ECCOBOND FP4531 passes NASA outgassing standards.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

| | |
|---|---|
| Viscosity, Brookfield - Cone & Plate, CP52, 25 °C, mPa·s (cP): | |
| Speed 20 rpm | 10,000 |
| Filler Content, % Ignition | 62 |
| Pot Life : | |
| @ 25ºC, hours (Time required to double viscosity), hours | 24 |
| Under typical dispensing conditions, hours | 8 |
| Shelf Life @ -40°C, days | 270 |
| Flash Point - See SDS | |

## TYPICAL CURING PERFORMANCE

### Gel Time

| | |
|---|---|
| Gel Time@ 121ºC, minutes | 6 |

### Recommended Snap Cure Schedule

7 minutes @ 160°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

| | | |
|---|---|---|
| Coefficient of Thermal Expansion, ppm/°C: | | |
| Below Tg | | 28 |
| Above Tg | | 104 |
| Glass Transition Temperature (Tg) by TMA, °C | | 161 |
| Extractable Ionic Content, : | | |
| Chloride (Cl-) | | 20 |
| Sodium (Na+) | | 5 |
| Potassium (K+) | | 5 |
| Flexural Modulus | N/mm² (psi) | 7,600 (1,102,000) |
| Thermal Conductivity , W/(m-K) | | 0.61 |

### Electrical Properties

| | |
|---|---|
| Volume Resistivity, ohm-cm | $1.71\times10^{+16}$ |
| Surface Resistivity, ohms | $1.87\times10^{+16}$ |
| Dielectric Strength, volts/mil | 1,470 |
| Dielectric Constant / Dissipation Factor @ 25ºC: | |
| @ 100KHz | 3.34/0.0088 |
| @ 1MHz | 3.29/0.0071 |
| @ 2MHz | 3.3/0.0073 |

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

### DIRECTIONS FOR USE

1. For best flow rates, a preheat temperature of 90 °C is recommended.
2. For best results in dispensing a 21 gauge needle should be used at 10 psi pressure.

### 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.

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**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**
(°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

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**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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