



FP4585

June 2011

PRODUCT DESCRIPTION

FP4585 provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Product Benefits	• Low CTE • High purity • Improved toughness • Forms a rigid, low stress seal • Dissipates stress on solder joints • Extends thermal cycling performance • Improved crack and fracture resistance • No-clean flux compatible
Filler Weight, %	60
Components	One-component
Cure	Heat cure
Application	Underfill
Typical Applications	Encapsulant for flip chip devices

FP4585 is a high purity, liquid epoxy encapsulant designed as an underfill for high-lead and lead-free bumped large die flip chip devices.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield - Cone & Plate, 25 °C, mPa·s (cP):

Speed 52/25 rpm	80,000
Specific Gravity	1.65
Pot Life @ 25 °C, hours	12
Gel Time @ 121°C, minutes	40
Shelf Life @ -40°C, months	9

Flash Point - See MSDS

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

120 minutes @ 165°C

Alternative Cure Schedule

120 minutes @ 150°C

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	35
Above Tg	102
Glass Transition Temperature (Tg) by TMA, °C:	
(Tg) by TMA	100
(Tg) by DMA	110
Storage Modulus, 25°C, MPa	7,300

GENERAL INFORMATION

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

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. Warm at room temperature until no longer cool to the touch (normally 60 to 90 minutes).
3. DO NOT thaw in an oven.

Directions for use

1. To encapsulate flip chips by capillary action, the chip and substrate must be thoroughly cleaned.
2. A bead of FP4585 is then applied to one or two sides (L-shape) of the chip perimeter.
3. For best results, the material should be dispensed onto a substrate that has been preheated to approximately 100 to 120°C and held at that temperature until flow stops.
4. After the material has completely flowed under the chip, the device must be promptly cured according to suggested cure to achieve full properties.
5. Devices with wet encapsulant should not be exposed to humidity in the air.
6. If the material cannot be initially gelled to a hard finish within 1 hour after dispensing, storage in desiccator cabinet is suggested until full curing is possible.

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

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

Note

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 and its affiliates ("Henkel") specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel products. Henkel 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 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.

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