



FP4531

January 2014

PRODUCT DESCRIPTION

FP4531 provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Product Benefits	• Snap curable • Fast flow
Cure	Heat cure
Application	Underfill
Typical Applications	Flex applications

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

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 :	
@ 25°C, hours (Time required to double viscosity), hours	24
Under typical dispensing conditions, hours	8
Shelf Life @ -40°C, days	274
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Gel Time

Gel Time @ 121°C, minutes	6
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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, ppm:	
Chloride (Cl-)	20
Sodium (Na+)	5
Potassium (K+)	5
Flexural Modulus	N/mm ² 7,600 (psi) (1,102,000)

GENERAL INFORMATION

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

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.

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. Storage below -40°C or greater than minus -40°C can adversely affect product properties.

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

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

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Reference 0.2