



FP4323

February 2012

PRODUCT DESCRIPTION

FP4323 provides the following product characteristics:

Technology	Epoxy
Appearance, Resin (Component A)	Black
Appearance, Hardener (Component B)	beige
Appearance (Mixture)	Black
Product Benefits	<ul style="list-style-type: none"> • Low CTE for improved thermal cycling • High purity • Thixotropic • Excellent moisture resistance • Excellent chemical resistance
Filler Weight, %	65
Filler Type	Silica
Mixing Ratio, by weight Component A: Component B	100 : 100
Cure	Heat cure
Application	Encapsulant - glob top
Typical Assembly Applications	Chip-on-board and Plastic PGA applications
Substrates	Plastic

FP4323 liquid epoxy encapsulant glob top is designed with flow capabilities that allows encapsulation without flowing beyond the chip.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A Properties

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 7, speed 2 rpm	172,500
Spindle 7, speed 20 rpm	115,000
Specific Gravity @ 25 °C	1.7
Shelf Life @ 25°C, months	12
Flash Point - See MSDS	

Part B Properties

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 7, speed 2 rpm	250,000
Spindle 7, speed 20 rpm	72,500
Specific Gravity @ 25 °C	1.7
Shelf Life @ 25°C, months	12
Flash Point - See MSDS	

Mixed Properties

Mixed Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 7, speed 2 rpm	220,000
Spindle 7, speed 20 rpm	100,000
Specific Gravity @ 25 °C	1.67
Gel Time @ 121°C, minutes	11
Pot Life @ 25 °C, days	2
Shelf Life @ -40 °C, months	9
Working Life @ 25 °C, hours	48
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

4 hours @ 150°C or
1 hour @ 170°C

Alternative Cure Schedule

2 hours @ 125°C + 4 hours @ 150°C

Substrate Temperature

Temperature, °C 90

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.

A two-step cure will minimize stress.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion ASTM D-3386, ppm/°C:	
Below Tg (40 to 120°C)	28
Glass Transition Temperature (Tg) by TMA, °C	174
Thermal Conductivity, W/mk	0.63
Shore Hardness, ISO 868, Durometer D	97
Linear Shrinkage, %	0.43
Extractable Ionic Content, ppm:	
Chloride (Cl-)	20
Sodium (Na+)	20
Potassium (K+)	20
Water Absorption, ISO 62, %:	
8 hours @ 100°C	0.25

Electrical Properties:

Dielectric Constant / Dissipation Factor, IEC 60250:	
1kHz	3.7 / 0.004
100 MHz	3.59 / 0.085
1 GHz	3.44 / 0.075
Volume Resistivity, IEC 60093, Ω·cm	6.2×10 ¹⁴
Surface Resistivity, IEC 60093, Ω	1.6×10 ¹⁴

GENERAL INFORMATION

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

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be used with chlorine or other strong oxidizing materials.

DIRECTIONS FOR USE

1. For best results, dispense onto substrate warmed to 90°C.
2. FP4323 may settle upon storage. Each container must be thoroughly mixed before combining.
3. Mix Part A and Part B separately for about 5 to 10 minutes on a standard paint shaker to ensure complete dispersion of the filler.



4. Stir with a large spatula to check for lumps.
5. Cold storage will minimize filler settling.
6. Part B may form a crust if exposed to moist air for an extended period of time. Keep in a well sealed container. For best results, do not use Part B which contains this crust caused by moisture contamination.
7. Thorough mechanical mixing of Part A and Part B together is required for best results. Hand mixing alone is not recommended.

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 (Mixed): -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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Reference 0.2