Hysol

FP4470

July 2010

PRODUCT DESCRIPTION

FP4470 provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Filler Weight, %	75
Product Benefits	• High purity • 260ºC reflow capability for Pb-free applications • Green product • Excellent flow properties
Cure	Heat cure
Application	Encapsulant
Typical Package Application	BGA, Chip scale packages, PBGA and Full arrays on LTCC
Operating Temperature	-65 to 150 °C

FP4470 liquid encapsulant features excellent flow properties allowing it to penetrate fine pitch wires and deep cavities without entrapping voids. This product can withstand solder reflow after being exposed to JEDEC level 2A (30°C/60% RH, 168 hours) preconditioning. A cavity or potting dam is required for flow control.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 6, speed 10 rpm	48,000
Specific Gravity @ 25 °C	1.8
Gel Time @ 121ºC, minutes	12
Pot Life @ 25ºC, days	3
Shelf Life @ -40°C, months	9
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Cure Schedule

30 minutes @ 125°C + 90 minutes @ 165°C

Substrate Temperature

Temperature, °C	75

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 (40 to 80°C)		18
Above Tg (170 to 210°C)		65
Glass Transition Temperature (Tg) by TMA, °C		148
Extractable Ionic Content, ppm:		
Chloride (Cl-)		<2
Sodium (Na+)		<2
Potassium (K+)		1
Flexural Modulus , ASTM D790	N/mm² (psi)	12,700 (1,841,500)
Flexural strength , ASTM D790	N/mm² (psi)	137 (19,865)

Electrical Properties:

Dielectric Constant / Dissipation Factor, IEC 60250:	
1MHz	3.5 / 0.01
Volume Resistivity, IEC 60093, Ω·cm	5×10^{16}

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 selected as a sealant for chlorine or other strong oxidizing materials.

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 results, dispense onto substrate warmed to 75°C.
2. Once dispensed, material should be cured within 30 minutes to prevent moisture contamination.
3. The cured properties of moisture contaminated material will be poorer than those described.
4. **NOTE:** Elevated temperatures reduce working life.

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. Storage below -40°C or greater than -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.

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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
N/mm^2 x 145 = psi
MPa x 145 = psi
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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Reference 0.1