



HYSOL FP4502

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PRODUCT DESCRIPTION

HYSOL FP4502 provides the following product characteristics:

Technology	Epoxy
Appearance	Gray
Product Benefits	• One component • Low CTE • Improved toughness • Forms a rigid, low stress seal • Dissipates stress on solder joints • Extends thermal cycling performance • No-clean flux compatible • Improved crack and fracture resistance
Filler content, ignition (ITM3A), %	65
Cure	Heat cure
Application	Underfill
Typical Applications	Encapsulant for flip chip devices

HYSOL FP4502 is a high purity, liquid epoxy designed as an underfill for flip chip devices.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield CP52, ASTM D2393, mPa·s (cP):

Speed 20 rpm, @ 25°C 35,000

Flow Rate, @ 500mil flow, 2mil gap @ 100 °C, seconds 30

Specific Gravity 1.68

Pot life (Time required to double viscosity), @ 25 °C, hours 24

Gel Time @ 121°C, minutes 21

Shelf Life @ -40°C (from date of manufacture), months 9

Flash Point - See MSDS

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

30 minutes @ 165°C

Alternative Cure Schedule

2 minutes, hours @ 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:

Glass Transition Temperature (T_g) by TMA, °C 115

Coefficient of Linear Thermal Expansion :

Alpha 1, ppm/°C 22

Alpha 2, ppm/°C 84

Extractable Ionic Content, , ppm:

Chloride (Cl-) 20

Sodium (Na+) 10

TYPICAL PERFORMANCE OF CURED MATERIAL

Miscellaneous:

Flexural Modulus, ASTM D790 N/mm² 9,500
(psi) (1,377,859)

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 HYSOL FP4502 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

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