



# HYSOL® FP4450

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## PRODUCT DESCRIPTION

Hysol® FP4450 is high purity, low stress liquid encapsulant with good moisture resistance and an extended working life. It is designed for protection of bare semiconductor devices. Pressure pot performance on live devices is up to 500 hours with no failures, depending upon device and package type. This material is designed for temperature cycling ranges up to -65°C to 150°C. Pot life or working life has been extended to approximately 3 days. This liquid epoxy exhibits relatively high flow. A cavity or a potting dam is required for flow control. Hysol® FP4450 may be suitable for bare chip protection in a variety of advanced packages such as IC memory cards, chip carriers, hybrid circuits, chip-on-board, multi-chip modules, ball grid arrays and pin grid arrays. The high temperature performance and excellent resistance to chemicals, moisture and handling damage, are also advantageous for automotive applications.

## TYPICAL APPLICATIONS

Semiconductor encapsulant

## PROPERTIES OF UNCURED MATERIAL

Color	Black	
Filler Content, %, (ITM3A)	73	
Specific Gravity, (ITM9A)	1.77	
Shelf Life @ -40°C (-40°F), months	9	
		<b>Typical Value</b>
Viscosity @ 25°C, (77°F) (ITM2A) Brookfield RVF Spindle 7, Speed 20, Cp	43,900	

## PHYSICAL PROPERTIES, CURED MATERIAL

Color	Black
Coefficient of Thermal Expansion, in/in/°C (ITM65B) (40°C-120°C)	18 x 10 <sup>-6</sup>
Glass Transition, (Tg), °C, (ITM65B)	162
Alpha particle emissions, cts/cm <sup>2</sup> /hr	0.005
Extractable Ionic Content (ITM107B)	
Chloride (Cl-), ppm	5
Sodium (Na+), ppm	1
Potassium (K+), ppm	2

## Handling

Pot Life @ 25°C, 77°F, days, (200 gram mass), (ITM10T),	3
Gel Time @ 121°C, (250°F), minutes (ITM10N)	12

Frozen packages must be completely thawed before use. Warm at room temperature until no longer cool to the touch (normally 20-60 minutes). For best results, FP4450 should be dispensed onto a substrate, warmed to approximately 80°C. This will help minimize air entrapment. Do not thaw in an

oven. Elevated temperatures reduce working life. Do not store above -40°C.

## 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 their strong oxidizing materials**

## Cure Schedule

Recommended Cure	30 minutes @ 125°C plus 90 minutes @ 165°C
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Designed to be used with packages which are affected by higher levels of stress. This cure will give optimum properties.

Alternate Cure 1 hour @ 165°C  
Designed for robust packages which are not sensitive to stress.

Use suggested cure schedules as general guidelines; other cure schedules may yield satisfactory results.

## Note

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## Loctite Electronics

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