



HYSOL®FP4321

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PRODUCT DESCRIPTION

Hysol® FP4321 is a high purity, third generation liquid epoxy encapsulant. It is designed for protection of bare semiconductor devices used in chip on board assemblies. It is suggested for assemblies with moderate reliability requirements. It is not suggested for use on ceramic substrates, aluminum bonding wire or large IC's (greater than 100 x 100 mils).

TYPICAL APPLICATIONS

Encapsulant for bare semiconductor devices used in chip on board assemblies.

PROPERTIES OF UNCURED MATERIAL

Color	Black
Filler content, %, Ash (ASTM D2584)	63
Specific Gravity (ASTM D1475))	1.79
Shelf Life @-40°C, (-40°F), months	6
Typical Value	
Viscosity @ 25°C, (77°F) (ASTM D2393)	
Brookfield RVF	
Spindle 7, Speed 2, Cp	100,000
Spindle 7, Speed 20, Cp	40,000

PHYSICAL PROPERTIES, CURED MATERIAL

Color	Black
Glass Transition (Tg), °C (ASTM D3386)	150
Coefficient of Thermal Expansion, In/in/°C, (ASTM D3386)	
α_1 (40-140°C)	37×10^{-6}
Extractable Ionic Content, (ITM107B)	
Chloride (Cl-), ppm	40
Sodium (Na+), ppm	20
Potassium (K+), ppm	20
Hardness, Shore D, (ASTM D2240)	95
Flexural Strength, psi, (ASTM D790)	9,500
Linear Shrinkage, %, (ASMT D2566)	.62
Moisture Absorption, % (ASTM D570)	
Immersion @ 100°C	
2 hrs	0.07
4 hrs	0.15
6 hrs	0.20
8 hrs	0.23

Electrical Properties

Volume Resistivity, Ohms-cm (ASTM D257)	5.0×10^{13}
Surface Resistivity, Ohms, (ASTM D257)	9.0×10^{14}
Dissipation Factor (D), ASTM D150	
1 KHz	0.005
10 KHz	0.007
100 KHz	0.010
Dielectric Constant (K), (ASTM D150)	
1 KHz	4.67
10 KHz	4.60
100 KHz	4.50

Handling

Gel Time @ 121°C, (250°F), minutes, (ITM10N)	13
Pot Life @ 25°C, (77°F), days, (ITM10T), Time to double Viscosity	4
Frozen storage at -40°C or lower is required for maximum shelf life. Frozen packages must be completely thawed before use. Warm at room temperature until no longer cool to the touch (normally 20-60 minutes). Do not thaw in an oven.	

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	1 hour @ 120°C plus 4-8 hours @ 160°C
Alternate Cure	6 to 10 hours @ 150°C

Use suggested cure conditions as general guidelines. Other cure conditions may yield satisfactory results. A two-step cure will minimize stress and warpage on large substrates. Curing below 140°C is not recommended. User should gel devices immediately after dispensing to prevent moisture degradation of ultimate cure properties. For best results FP4321 should be dispensed onto a substrate warmed to approximately 90°C. This will help minimize air entrapment under bonding wire.

Note

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Loctite Electronics

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