



Hysol® FP4322

December 2002

PRODUCT DESCRIPTION

Hysol® FP4322 is a high purity liquid epoxy encapsulant designed for semiconductor encapsulation. It is a high flow material which requires a cavity or flow control barrier to prevent excessive flow. Hysol FP4322 is suitable for encapsulation of bare chips mounted to plastic substrates as well as potting of small hybrid circuit modules. Spot encapsulation of bare chips on ceramic substrates is not suggested in most cases.

TYPICAL APPLICATIONS

Semiconductor encapsulation.

PROPERTIES OF UNCURED MATERIAL

Color	Black
Filler Content, % (ASTM D2584)	65
Specific Gravity @25°C, (77°F) (ASTM D1475)	1.69
Shelf Life @-40°C (-40°F), months	9
Typical Value	
Viscosity @ 25°C, (77°F) (ITM2A) (ASTM D2393)	
Brookfield RVF	
Spindle 7, Speed 2, Cp	92,500
Spindle 7, Speed 20, Cp	52,500

PHYSICAL PROPERTIES, CURED MATERIAL

Color	Black
Coefficient of Thermal Expansion, in/in/°C (ASTM D3386) (40°-120°C)	30 x 10 ⁻⁶
Linear Shrinkage, % (ASTM D2566)	.43
Density, gm/cc (ASTM D792)	1.7
Glass Transition, (T _g), °C, (ASTM D3386)	160
Hardness, Shore D (ASTM D2240)	97
Moisture Absorption, % (ASTM D570) Immersion @ 100°C, 8 hrs	0.25
Extractable Ionic Content (ITM107B)	
Chloride (Cl ⁻), ppm	25
Potassium (K ⁺), ppm	25
Sodium	25

Cured Electrical Properties

	25°C	
	K	D
1kHz	3.18	0.005
10kHz	3.15	0.006
100kHz	3.04	0.11

Volume Resistivity	6.2 x 10 ¹⁴
Surface Resistivity	1.6 x 10 ¹⁴
K	= Dielectric constant by ASTM D150
D	= Dissipation Factor by ASTM D150

Vol. Res.= Volume Resistivity in ohm-cm by ASTM D257

Surf.Res.= Surface Resistivity in ohm by ASTM D257

Handling

Pot Life @ 25°C, 77°F, days, 1
(ITM10T), time to double in viscosity

Gel Time @ 121°C, (250°F), minutes,
(ITM10N) 11

Shelf life at room temperature is approximately 2 days. Product may be stored at -40°C for greater than 6 months. Frozen packages must be thawed before use. Warm at room temperature until no longer cool to the touch (normally 20-60 minutes). Do not thaw in an oven or water bath. For best results FP4322 should be dispensed onto a substrate warmed to approximately 90°C. This will help minimize air entrapment under bonding wire.

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 2-3 hours @ 170°C or
3-6 hours @ 150°C

Alternate Cure 1 hour @ 125°C plus
(Low Stress) 4 hours @ 150°C
(Designed for packages which are effected by high levels of stress.)

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

Note

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