

RESILIENT, CLEAR ENCAPSULANTS

Multi-Cure[®] 9001-E-V3 SERIES

DESCRIPTION

9001-E-V3 Series encapsulants are performance upgrades of the flexible "instant curing" Dymax 9001 UV/visible light curing encapsulant, with improved moisture, thermal cycle resistance and adhesion to various component substrates. Curing completely in as little as five seconds upon exposure to longwave UV and visible light, these materials are environmentally resistant with good ionic and electrical properties. Multi-Cure[®] 9001-E-V3 Series encapsulants display excellent adhesion to printed circuit boards and electronic components and are especially well suited for chip on board, chip on flex, and multi-chip modules.

UNCURED PROPERTIES (not specifications)

Solvent Content		None, 100% Solids	
Isocyanate Content		None	
Chemical Class		Modified Urethane	
Appearance		Liquid	
Color		Clear	
Solubility		Alcohols/Chlorinated Solvents/Ketones	
Viscosity (20 rpm)	9001-E-V3.1	4,500 cP (nominal)	ASTM D-2556
	9001-E-V3.5	17,000 cP (nominal)	ASTM D-2556
	9001-E-V3.7	50,000 cP (nominal)	ASTM D-2556

CURED PROPERTIES (not specifications)

PHYSICAL

Durometer Hardness	D45 (nominal)	ASTM D-2240
Elongation at Break	150%	ASTM D-638
Tensile at Break	750 psi	ASTM D-638
Modulus of Elasticity	2,500 psi	ASTM D-638
Water Absorption (24 h)	1.0%	ASTM D-570
Boiling Water Absorption (2 h)	2.6%	ASTM D-570
Thermal Limit	150°C	DSTM D-200*
Glass Transition, T _g	30°C	ASTM E-831
Coefficient of Thermal Expansion, α ₁	95 x 10 ⁻⁶ in/in/°C	ASTM E-831
Coefficient of Thermal Expansion, α ₂	180 x 10 ⁻⁶ in/in/°C	ASTM E-831
Linear Shrinkage	2%	ASTM D-2556

*DSTM Refers to Dymax Standard Test Method

Thermal Shear Stress (-55°C to 125°C) on:

Aluminum	16.4 psi
FR-4	16.9 psi
Gold	17.0 psi
Silicon	17.5 psi
Solder	16.0 psi

Ionic Purity:

Extractable Chloride	<10 ppm
Sodium	<10 ppm
Potassium	<10 ppm
Fluoride	<10 ppm

RELIABILITY

Thermal Shock (0.25 mil wire)	>2,000 cycles (-40°C to 125°C)
Humidity	>1,000 h, 85°C/85% RH
Autoclave	>1,000 h

ELECTRICAL

Dielectric Strength	500 Volts/Mil	ASTM D-1304
Volume Resistivity	555×10^{12} ohm cm	ASTM D-1304
Surface Resistivity	$6,300 \times 10^{12}$ ohm	ASTM D-1304
Dissipation Factor, 1 MHz	0.046 (23°C)	ASTM D-1304
Dielectric Constant, 1 MHz	3.27 (23°C)	ASTM D-1304

HOW TO CURE WITH UV/VISIBLE LIGHT & IR:**I. Clear adhesive completely exposed to UV/Visible light:**

<u>Exposure Time</u>	<u>UV/visible Lamp</u>	<u>Light Intensity</u>	<u>Distance</u>	<u>Spectral Output</u>
30 sec	Light-Welder [®] 5000-EC	150 mW/cm ²	3 inches	300-500 nm

Multi-Cure[®] 9001-E-V3 Series encapsulants cure upon exposure to high intensity UV/Visible light in wavelengths between 300-500 nm in 10-30 seconds. The speed of light cure depends on the thickness of the encapsulant layer and the intensity from the light source.

II. Heat cure shadowed areas following UV exposure:

Heat may be used as a secondary cure mechanism when some encapsulant is shielded from light. Light cure must be done prior to heat cure. Any of the following schedules may be used:

<u>Minimum Adhesive Temperature</u>	<u>Time</u>
110°C (225°F)	60 Minutes
120°C (250°F)	30 Minutes
150°C (300°F)	15 Minutes

DISPENSING AND HANDLING ADHESIVE

Avoid prolonged exposure to ambient fluorescing lighting. Failing to do so may cause the 9001-E-V3 Series encapsulants to polymerize prematurely.

Multi-Cure[®] 9001-E-V3 Series encapsulants may be dispensed from a variety of automatic bench-top syringe applicators or other equipment. Skin contact should be avoided. Use barrier hand cream. Wear impervious gloves. Do not wear absorbent gloves. Adhesive may be removed with basic soap and water. Avoid eye contact. Wipe excess adhesive with paper towels and remove residue with isopropanol.

STORAGE AND SHELF LIFE

Store material in a cool, dark place when not in use. Do not expose to UV light or sunlight. Material may polymerize upon prolonged exposure to ambient light. Replace lid immediately after use. Product has a one-year shelf life when stored below 90°F in the original, unopened container. These products do not support fungal or bacterial growth.

CAUTION

For industrial use only. Avoid breathing vapors. Avoid contact with eyes and clothing. In case of skin contact, immediately flush with water for at least 15 minutes; for eyes, get medical attention. Wash clothing before reuse. Keep out of reach of children. Do not take internally. If swallowed, vomiting should be induced at once and a physician called. For specific information, refer to the product's Material Safety Data Sheet before use.

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The data contained in this bulletin which represents typical results, is furnished for information only, and is believed to be reliable. We cannot assume responsibility for results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any product or method mentioned herein and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use thereof. Nothing in this bulletin is to be interpreted as a representation of freedom from domination of patents owned by others or a license under a Dymax Corporation patent. We recommend that each prospective user test the proposed application before repetitive use, using the data as a guide. For specific information, refer to Material Safety Data Sheet before use. REV 09-21-09

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