SpeedMask® 9-7001

PCB Protective Maskant - Color Change on Cure & Blue Fluorescing Tracer

APPLICATIONS

- Masking for most Solvent-Based Conformal Coating Applications
- Masking for Wave Solder or Reflow Processes

FEATURES

- UV/Visible Light Cure
- One Layer Protection
- Compatible with Gold and Copper Connector Pins
- Visibile Pink Color in Uncured State
- Non-slumping When Dispensed
- Halogen Free
- Resistance to most Solvent-Based Conformal Coatings and Primers

OTHER FEATURES

- Thixotropic for Manual or Automated Dispensing
- Fast Curing
- Tack free with Depth of Cure up to 0.5"
- Lower Shrinkage

SpeedMask® 9-7001 cures upon exposure to light and is designed to provide protection of connectors and board surfaces during most solvent-based or light-curable conformal coating applications in PCB assembly. The maskant is easily removable by peeling, eliminating the concern of ionic contamination or silicone left behind by other masking methods. This 100% organic resin cures quickly upon exposure to light and contains no nonreactive solvents. The ability of SpeedMask resins to cure in seconds enables faster processing, greater output, and lower processing costs. When cured with Dymax light-curing spot lamps, focused-beam lamps, or flood lamps, they deliver optimum speed and performance for many masking applications. Dymax lamps offer the ideal balance of UV and visible light for the fastest, deepest cures. This product is in full compliance with RoHS directives 2015/863/EU.

UNCURED PROPERTIES *

Property	Value	Test Method
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Pink Translucent Gel in Uncured State	N/A
Soluble in	Organic Solvents	N/A
Density, g/ml	1.14 g/ml	ASTM D1875
Viscosity, cP	40,000 (nominal)	DSTM 502‡
Shelf Life at Recommended Conditions from Date of Manufacture	12 months	N/A

CURED MECHANICAL PROPERTIES *

Property	Value	Test Method
Durometer Hardness	A70	ASTM D2240
Tensile at Break, MPa [psi]	3.8 [560]	ASTM D638
Elongation at Break, %	180	ASTM D638
Modulus of Elasticity, MPa [psi]	1.9 [275]	ASTM D638

OTHER CURED PROPERTIES *

Property	Value	Test Method
Boiling Water Absorption, % (2 hr)	9.8	ASTM D570
Water Absorption, % (25°C, 24 h)	16.6	ASTM D570
Linear Shrinkage, %	1.9	ASTM D2566
Glass Transition Tg, °C	15	ASTM D5418

DISPENSE EQUIPMENT RECOMMENDATIONS *

Application	Manual	Semi-Automated	Fully Automated
Keep Out Areas	SD-200	Model 400 Needle Valve	eco-PEN450

CURING EQUIPMENT RECOMMENDATIONS *

Process Method	Spot Lamp	Flood Lamp	Conveyor
LED Curing/Wavelength	BlueWave® MX-150 PrimeCure® (385 nm)	BlueWave® AX-550 PrimeCure® (385 nm)	UVCS Conveyor with LED Floods
Broad Spectrum	BlueWave® 200	5000-ECE or PortaRay 400	UVCS Conveyor with Fusion F300S

* Not Specifications
N/A Not Applicable
‡ DSTM Refers to Dymax Standard Test Method

Technical Data Collected April 2016 Rev.02/15/2024

CURING GUIDELINES

Cure rate is dependent upon many variables including lamp intensity, distance from the light source, and required depth of cure. The cure times below are based on lab results and are intended for reference only. Testing was performed using a 0.38 mm [0.015 in] coating thickness. Time/belt speed was determined by a complete, tack-free cure.

Dymax Curing System (Intensity)	Cure Time or Belt Speed
5000-EC (200 mW/cm^2)[A]	3 s
BlueWave® LED Prime UVA, QX-4 Spot (10 W/cm^2)[B]	1 s
BlueWave® LED Flood (675 mW/cm^2)[B]	2 s
BlueWave® 200 (10 W/cm^2)[A]	1 s
Porta-Ray 400 (400 mW/cm^2)[A]	1 s
UVCS Conveyor with Fusion F300S (2.5 W/cm^2)[C]	6.1 m/min20 [ft/min]

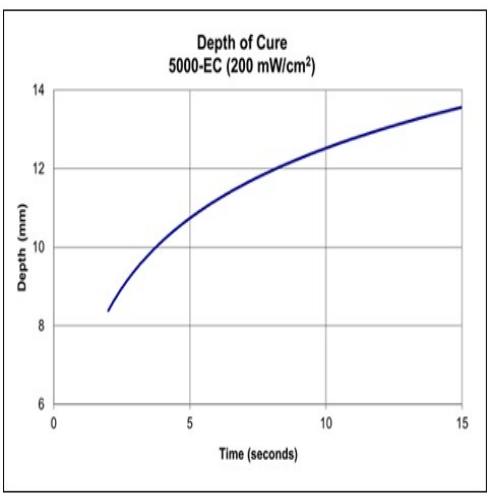
A Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 50 Radiometer.
B Intensity was measured over the light range of 350-450 nm using a Dymax ACCU-CAL™ 50-LED Radiometer.
C At 53 mm [2.1 in] focal distance. Maximum speed of conveyor is 8.2 m/min [27 ft/min]. Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 160 Radiometer.

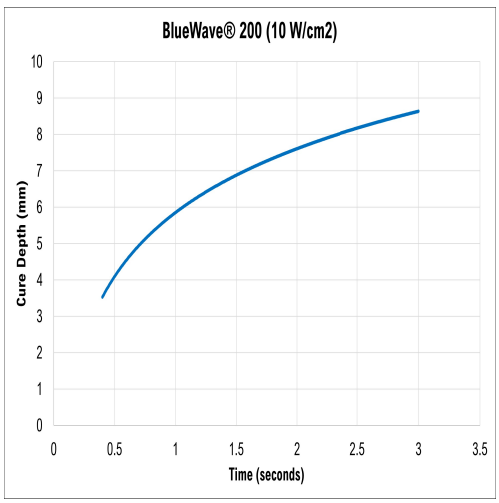
Full cure is best determined empirically by curing at different times and intensities, and measuring the corresponding change in cured properties such as tackiness, adhesion, hardness, etc. Full cure is defined as the point at which more light exposure no longer improves cured properties. Higher intensities or longer cure times may degrade Dymax light-curable maskants.

Dymax recommends that customers employ a safety factor by curing longer and/or at higher intensities than required for full cure. Although Dymax Application Engineering can provide technical support and assist with process development, each customer must ultimately determine and qualify the appropriate curing parameters required for their unique application.

DEPTH OF CURE

The graph below shows the increase in depth of cure as a function of exposure time. A 9.5 mm [0.37 in] diameter specimen was cured in a polypropylene mold and cooled to room temperature. It was then released from the mold and the cure depth was measured.





OPTIMIZING PERFORMANCE AND HANDLING

1. This product cures with exposure to UV and visible light. Exposure to ambient and artificial light should be kept to a minimum before curing. Dispensing components, including needles and fluid lines, should be 100% light blocking, not just UV blocking.
2. All surfaces to be masked should be clean and free from grease, mold release, or other contaminants prior to dispensing the resin.
3. Oxygen in the atmosphere may inhibit surface cure. Surfaces exposed to air may require higher intensity UV (>100 mW/cm^2) to produce a tack-free cure. Flooding the bond area with an inert gas, such as nitrogen, can also reduce the effects of oxygen inhibition.
4. Cured part should be allowed to cool before testing.
5. Light curing generally produces some heat. If necessary, cooling fans can be placed in the curing area to reduce the heating effect on components.
6. At the point of curing, an air exhaust system is recommended to dissipate any heat and vapors formed during the curing process.
7. Cure speed is dependent upon many variables, including lamp intensity, distance from the light source, required depth of cure, bond gap, and percent light transmission of the substrate.

DISPENSING SUPPORT

The Dymax Application Engineering team is ready to discuss your application requirements to provide the most appropriate dispensing and/or spraying solution. Visit our current dispensing equipment portfolio here or consult our global contact phone numbers and online chat feature (available in North America only) during normal business hours for instant support.

STORAGE AND SHELF LIFE

Store the material in a cool, dark place when not in use. Do not expose to light. This product may polymerize upon prolonged exposure to ambient and artificial light. Keep covered when not in use. This material shelf life is noted on page 1 of this document, when stored between 10°C (50°F) and 32°C (90°F) in the original container.

CLEAN UP

Uncured material may be removed from dispensing components and parts with organic solvents. Cured material will be impervious to many solvents and difficult to remove.

The removal of the cured maskant can be aided with the use of a hand tool (plastic, anti-static or metal), heat aided to localize area, an ultrasonic bath, dry ice blast or embrittlement, water jet blast, or automated grippers.

GENERAL INFORMATION

This product is intended for industrial use only. Keep out of the reach of children. Avoid breathing vapors. Avoid contact with skin, eyes, and clothing. Wear impervious gloves. Repeated or continuous skin contact with uncured material may cause irritation. Remove material from skin with soap and water. Never use organic solvents to remove material from skin and eyes. For more information on the safe handling of this material, please refer to the Safety Data Sheet before use.

The data provided in this document are based on historical testing that Dymax performed under laboratory conditions as they existed at that time and are for informational purposes only. The data are neither specifications nor guarantees of future performance in a particular application. Dymax does not guarantee that this product's properties are suitable for the user's intended purpose.

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