9310 Preliminary

Light-Cure BGA, CSP Reinforcement Adhesive with Heat-Cure Technology

APPLICATIONS

- Reinforcement of Fine-Pitch or Leadless Components on Printed Circuit Boards
- Shock Absorption
- Underfill Alternative

FEATURES

- UV/Visible Light Cure
- Heat-Cure Technology

OTHER FEATURES

- High Viscosity
- Highly Thixotropic
- Adhesion to Various PCB Substrates
- Reduces Stress on Components

Dymax 9310 cures upon exposure to light and is designed for rapid ruggedization of circuit board components. Dymax 9310 adhesive is specially formulated to cure with heat in applications where shadow areas exist. Dymax Multi-Cure® materials contain no nonreactive solvents. Their ability 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. Dymax lamps offer the ideal balance of UV and visible light for the fastest, deepest cures. This product is in full compliance with the 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	Translucent Gel	N/A
Soluble in	Organic Solvents	N/A
Density, g/ml	1.05	ASTM D1875
Viscosity, cP	51,000 (nominal)	ASTM D2556
Shelf Life at Recommended Conditions from Date of Manufacture	6 month	N/A

CURED MECHANICAL PROPERTIES *

Property	Value	Test Method
Durometer Hardness	D60	ASTM D2240
Tensile at Break, MPa [psi]	12 [1,700]	ASTM D638
Elongation at Break, %	145.5	ASTM D638
Modulus of Elasticity, MPa [psi]	103 [15,000]	ASTM D638
Glass Transition Temperature (Tg), °C	48	ASTM D5418
CTEα1, µm/m/°C	117	ASTM E831
CTEα2, µm/m/°C	180	ASTM E831

OTHER CURED PROPERTIES *

Property	Value	Test Method
Boiling Water Absorption, % (2 h)	5	ASTM D570
Water Absorption, % (25°C, 24 h)	5	ASTM D570
Linear Shrinkage, %	2.1	ASTM D2566

ADHESION

Substrate	Recommendation
PVC poly(vinyl chloride) , rigid	✔
SAN styrene-acrylonitrile	✔
GL glass (borosilicate, quartz, mica)	✔

✔ Recommended o Limited Applications

st Requires Surface Treatment (e.g. plasma, corona treatment, etc.)

* Not Specifications

N/A Not Applicable

Technical Data Collected 7/14/2023 Rev.04/03/2024

SECONDARY HEAT CURE

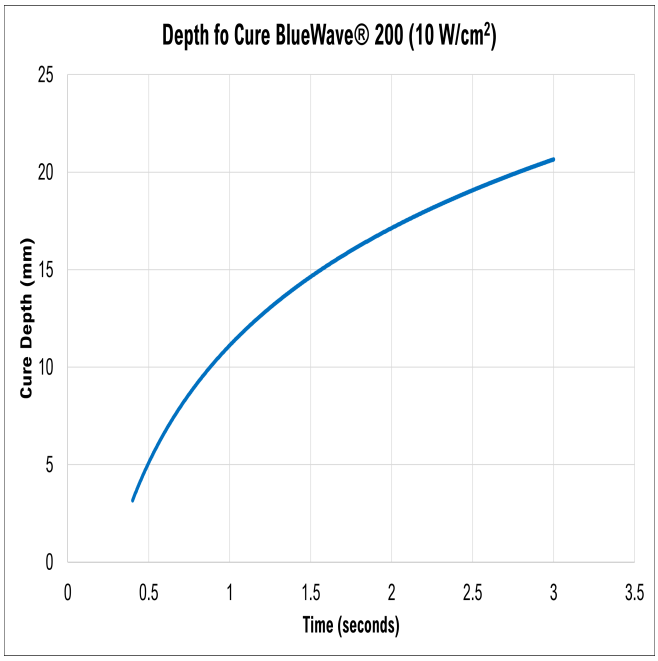
Heat can be used as a secondary cure mechanism where the adhesive cannot be cured with light. Light curing must be done prior to heat cure. The following heat-cure schedule may be used:

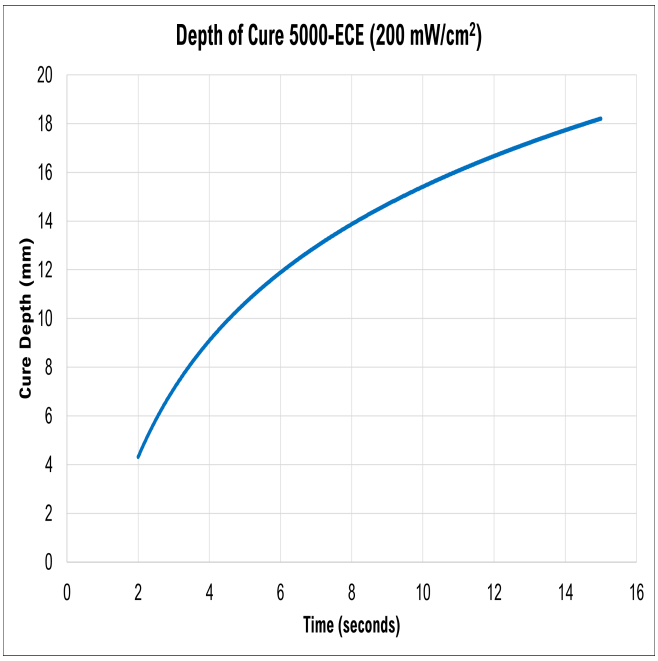
Temperature	Time*
110°C [230°F]	60 minutes
120°C [250°F]	30 minutes
150°C [300°F]	15 minutes

*Note: Actual heat-cure time may vary due to part configuration, volume of adhesive applied, and oven efficiency.

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 in contact with the material should be clean and free from flux residue, grease, mold release, or other contaminants prior to dispensing the material.
3. Cure speed is dependent upon many variables, including lamp intensity, distance from the light source, required depth of cure, thickness, and percent light transmission of components between the material and light source.
4. Oxygen in the atmosphere may inhibit surface cure. Surfaces exposed to air may require high-intensity (>100 mW/cm^2) UV light to produce a dry surface cure. Flooding the curing area with an inert gas, such as nitrogen, can also reduce the effects of oxygen inhibition.
5. Parts should be allowed to cool after cure before testing and subjecting to any loads or electrical testing.
6. In rare cases, stress cracking may occur in assembled parts. Three options may be explored to eliminate this problem. One option is to heat anneal the parts to remove molded-in stresses. A second option is to open any gap between mating parts to reduce stress caused by an interference fit. The third option is to minimize the amount of time the liquid material remains in contact with the substrate(s) prior to curing.
7. Light curing generally produces some heat. If necessary, cooling fans can be placed in the curing area to reduce the heating effect on components.
8. At the point of curing, an air exhaust system is recommended to dissipate any heat and vapors formed during the curing process.

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 noted on page 1 of this document, when stored between 10°C (50°F) and 32°C (90°F) in the original, unopened container.

CLEANUP

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. Cleanup of cured material may require mechanical methods such as ultrasonic bath, water jet, vacuum tweezers, air knife and/or warming to aid in the removal.

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.

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