Multi-Cure® 9452-FC
Very Low Viscosity Conformal Coating

APPLICATIONS
- Thin Conformal Coating
- Film Coating/Flow Coating Dispensing

FEATURES
- UV/Visible Light Cure
- Secondary Heat Cure
- LED Curable
- Flammability (V0 Internal)

OTHER FEATURES
- Blue Fluorescing
- Shadow Area Cure
- Very Good Thermal Shock Resistance
- Excellent Wettability
- 100% Solids

Dymax Multi-Cure® 9452-FC is a thin 100% solids conformal coating that cures upon exposure to light and is designed for applications using film coating/flow coating or similar dispensing methods. Dymax 9452-FC is a Multi-Cure material specially formulated to cure with secondary heat in applications where shadowed areas exist. Dymax Multi-Cure materials contain no nonreactive solvents and cure upon exposure to light. Their ability to cure in seconds enables faster processing, greater output, and lower processing costs. In addition, Dymax 9452-FC is LED curable at wavelengths of 365 nm, 385 nm and 405 nm. 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 RoHS directives 2015/863/EU.

UNCURED PROPERTIES *

Property	Value	Test Method
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylic/Epoxy	N/A
Appearance	Clear to Yellow	N/A
Soluble in	Organic Solvents	N/A
Density, g/ml	1.06 g/ml	ASTM D1875
Viscosity, cP (20 rpm)	20 (nominal)	DSTM 502
Shelf Life at Recommended Conditions from Date of Manufacture	7 months	N/A

CURED MECHANICAL PROPERTIES *

Property	Value	Test Method
Durometer Hardness	D60	ASTM D2240
Tensile at Break, MPa [psi]	34 [4,950]	ASTM D638
Elongation at Break, %	6	ASTM D638
Modulus of Elasticity, MPa [psi]	1,137 [165,000]	ASTM D638
Glass Transition Tg, °C	80	ASTM D5418
CTEα_1, µm/m/°C	105	ASTM E831
CTEα_2, µm/m/°C	225	ASTM E831
Linear Shrinkage, %	0.40	ASTM D2566

ELECTRICAL PROPERTIES *

Property	Value	Test Method
Dielectric Constant (1 MHz)	2.77	ASTM D150
Dissipation Factor (1 MHz)	0.03	ASTM D150
Dielectric Breakdown Voltage, kV/mm [V/mil]	40 [1,000]	ASTM D149
Volume Resistivity, ohm-cm	3.55E +14	ASTM D257
Surface Resistivity, ohm	1.50E +12	ASTM D257

ADHESION

Substrate	Recommendation
PCB Solder Masks (most common)	Good

✔ Recommended o Limited Applications

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

THERMAL SHOCK

Thickness @ 2 mils (300 cycles of -35°C to 135°C, 30 minutes dwell at each temperature.)	Pass

* Not Specifications

N/A Not Applicable

‡ DSTM Refers to Dymax Standard Test Method

Technical Data Collected 2018 Rev.02/10/2023

CURING GUIDELINES

UV-curing guidelines for 9452-FC at 0.001-0.002 in (0.0254-0.0508 mm)

Dymax Curing System (Intensity)	Fixture Time or Belt Speed [A]
5000-EC (225 mW/cm^2)[A]	25 s
UVCS Conveyor with Fusion D lamp (2.5 W/cm^2)[B]	1.8 m/min [6 ft/min]
BlueWave® 365 nm Flood (300 mW/cm^2)[C]	20 s
BlueWave® 385 nm Flood (300 mW/cm^2)[C]	30 s
BlueWave® 405 nm Flood (300 mW/cm^2)[C]	30 s

A Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 50 Radiometer.

B Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 160 Radiometer.

C Intensity was measured over the UVA/Visible range (350-450 nm) using a Dymax ACCU-CAL™ 50-LED Radiometer.

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:

120°C [250°F] 30 minutes
150°C [300°F] 20 minutes

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

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 ultimately must determine and qualify the appropriate curing parameters required for their unique application.

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.

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. Cleanup of cured material may require mechanical methods of removal 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.

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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