

ADHESIVE FOR BONDING SEBS AND PVC

Ultra Light-Weld® 111-MSK

APPLICATIONS

- Facemasks
- Respiratory Devices
- Resuscitator Bags

FEATURES

- Fluorescing
- Solvent Free
- Moisture Resistant
- Fast Curing
- Flexible

BONDS

- SEBS
- PVC
- Polyurethane
- Polystyrene
- TPE's

BIO APPROVALS

- ISO 10993 Cytotoxicity

DYMAX MD® Medical Device 111-MSK adhesive is designed for rapid bonding of plastics including SEBS and PVC typically used in the manufacture of facemasks and similar respiratory devices found in breathing circuits. This product dispenses easily and cures quickly for precise quantity and placement of adhesive. DYMAX MD adhesives are solvent-free and cure only upon exposure to UV and/or visible light. Their ability to cure in seconds enables faster processing, greater output, and lower assembly costs. Dymax 111-MSK fluoresces for in-line inspection under low intensity "black" light (365nm). When cured with DYMAX UV light curing spot lamps, focused beam lamps, or flood lamps, they deliver optimum speed and performance for medical device assembly. DYMAX lamps offer the optimum balance of UV and visible light for the fastest, deepest cures. This product is in full compliance with the RoHS Directives 2002/95/EC and 2003/11EC.

TYPICAL UNCURED PROPERTIES *

Property	Value	Test Method
Solvent Content	No Non-reactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Clear/Light Amber Liquid	N/A
Flash Point	>93°C (200°F)	N/A
Density (g/ml)	1.05	ASTM D-1875
Viscosity (20 rpm)	280 cP (nominal)	ASTM D-1084

OTHER CURED PROPERTIES *

Property	Value	Test Method
Linear Shrinkage (%)	0.5	ASTM D-2566
Boiling Water Absorption, 2 hr (%)	0.1	ASTM D-570
Water Absorption @ 25°C, 24hr (%)	0.1	ASTM D-570

CURED MECHANICAL PROPERTIES *

Property	Value	Test Method
Durometer Hardness	D50	ASTM D-2240
Tensile at Break (psi • MPa)	900 • 6.2	ASTM D-638
Elongation at Break (%)	200%	ASTM D-638
Modulus of Elasticity (psi • MPa)	10,000 • 70	ASTM D-638

ADHESION

Substrate	Recommendation
ABS	✓
Aluminum	✓
C-Flex	st
Polyester (PET)	o
PETG	✓
Polyurethane	✓
Polyvinyl Chloride	✓
SEBS	✓

✓ Recommended Adhesive o Limited Applications
 st Requires Surface Treatment (e.g., plasma, corona treatment, etc.)

* Not Specifications



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CURING GUIDELINES

Fixture Time is defined as the time to develop a shear strength of 10 psi (0.1 N/mm²) between glass slides. Actual cure time is typically 3 to 5 times fixture time.

DYMAX Curing System Intensity	Fixture Time/Speed ^B
2000-EC (50 mW/cm ²) ^A	1 sec
5000-EC (200 mW/cm ²) ^A	<1 sec
BlueWave™ 200 (10 W/cm ²) ^A	0.2 sec
BlueWave™ 50 AS (3.0 W/cm ²) ^A	<0.2 sec
UVCS Conveyor with one 5000-EC (200 mW/cm ²) ^A	24 ft/min
UVCS Conveyor with Fusion F300S (2.5 W/cm ²) ^C	27 ft/min

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

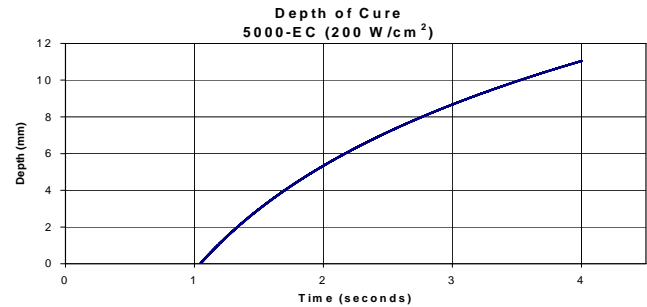
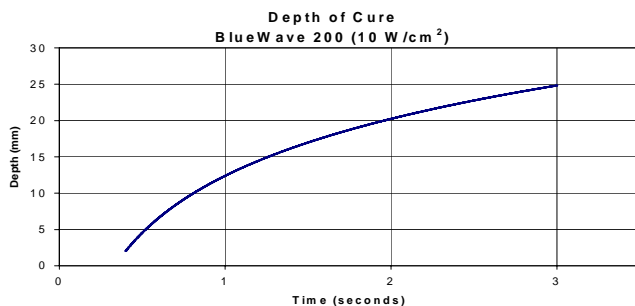
^B Curing through light blocking substrates may require longer cure times if they obstruct wavelengths used for light curing (320-450 nm for UV light+visible light curing and 320-400 nm for UV light-only curing). These fixture times/speeds are typical for curing thin films through 100% light transmitting substrates.

^C At 2.1" focal distance. Maximum speed of conveyor is 27 feet per minute (fpm). Intensity was measured over the UVA range (310-395nm) using the Dymax ACCU-CAL™ 100 Radiometer.

Full cure is best determined empirically by curing at different times and/or 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 UV exposure no longer improves cured properties. Higher intensities or longer cures (up to 5x) will generally not degrade DYMAX UV curing adhesives. DYMAX recommends that customers employ a safety factor by curing longer and/or at higher intensities than required for full cure. Although DYMAX Applications Engineering can help, each customer must ultimately determine the curing parameters required for their unique application.

DEPTH OF CURE

The following graphs show the increase in depth of cure of a 0.375" (9.5 mm) diameter slug cured in a polypropylene mold with different light sources.


OPTIMIZING PERFORMANCE AND HANDLING

1. This product cures with exposure to UV and/or visible light. Exposure to UV, 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 bond surfaces should be clean and free from grease, mold release, or other contaminants prior to dispensing the adhesive.
3. Cure speed is dependent upon many variables, including lamp intensity, distance from the light source, required depth-of-cure, bond gap and transmission of the substrate through which the energy must pass.
4. Oxygen may inhibit surface cure. Surfaces exposed to air may require high intensity UV (> 100 mW/cm²) to produce a tack-free cure. Flooding the bond area with an inert gas, such as nitrogen, can also reduce the affects of oxygen inhibition.
5. Parts should be allowed to cool after cure before testing and subjecting to any loads.
6. For rare applications, stress cracking may occur in assembled parts. Three options may be explored to minimize this problem from occurring. One option is to heat anneal the parts to remove molded-in stresses. A second option is to open the gap between mating parts to reduce stress caused by an interference fit. The third option is to minimize the amount of time the liquid adhesive remains in contact with the substrate(s) prior to curing.
7. UV curing generally produces some heat. If necessary, cooling fans can be placed in the curing area to reduce heat.
8. A good practice is to utilize an air exhaust system at the point of curing. This will dissipate the heat and vapors formed during the curing process.

DISPENSING THE ADHESIVE

This material may be dispensed with a variety of automatic bench-top syringe applicators or other equipment as required. Direct questions relating to dispensing and curing systems for specific applications, should be referred to the DYMAX Applications Engineering at (860) 482-1010.

BIOCOMPATIBILITY & STERILIZATION

DYMAX MD[®] Medical Device adhesives are subjected to various biocompatibility tests in accordance with USP Class VI and/or ISO 10993 recommendations for disposable medical devices. The completed tests are identified on each Product Data Sheet (PDS). Copies of the test reports are available upon request. Unless otherwise noted on the PDS, these adhesives have not been tested for prolonged or permanent implantation. In all cases, it is the user's responsibility to determine and validate the suitability of these adhesives in the intended medical device.

SME Technical Paper #AS91-397, 1991, advises that "All adhesives are toxic in their raw or uncured state. Complete cure...is required to retain Class VI certification status." It is recommended that biocompatibility testing of the completed device be done following sterilization. The sterilization methods of choice are gamma irradiation and ethylene oxide. Sterilization by autoclaving may be limited to certain applications. It remains the user's obligation to ascertain the effect of sterilization on the cured adhesive.

STORAGE AND SHELF LIFE

Store the material in a cool, dark place when not in use. Do not expose to visible or UV light. This product may polymerize upon prolonged exposure to ambient light. Keep covered when not in use. This material has a one-year shelf life 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. Clean up of cured material may require mechanical methods of removal.

GENERAL INFORMATION

This product is intended for industrial use only. Keep out of 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 Material Safety Data Sheet before use.

RECOMMENDED DYMAX LITERATURE

Lit010A	Guide to Selecting and Using UV Light Curing Systems
Lit012B	MD [®] Adhesives for Medical Device Assembly
Lit077	Chemical Safety
Lit133	UV Light Curing System Safety Considerations
Lit159	ACCU-CAL™ 50 Radiometer
Lit206	Flood and Focused Beam UV Light Curing Systems
Lit218	BlueWave™ 200 UV Light Curing Spot Lamp

Literature is available through sales partners, www.dymax.com or by calling any DYMAX location.

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