

## See-Cure™ 1201-M-SC FLEXIBLE ADHESIVE FOR PLASTICS

**APPLICATIONS**

- Tube Sets
- Reservoirs
- Catheters

**FEATURES**

- Blue to Clear upon Exposure to UV/Visible Light
- UV/Visible Light Cure
- Flexible

**RECOMMENDED SUBSTRATES**

- PC
- PVC
- PU
- ABS
- PET
- PEBA

**BIOCOMPATIBILITY**

- ISO 10993 Hemolysis
- ISO 10993 Cytotoxicity
- ISO 10993 Implantation (14 days)
- ISO 10993 Intracutaneous
- ISO 10993 Systemic Toxicity

DYMAX MD<sup>®</sup> Medical Device Adhesive, 1201-M-SC, is designed for rapid bonding of a variety of rigid and flexible plastics typically used in the manufacture of medical devices. The blue color of DYMAX See-Cure™ products disappears when they are fully cured. DYMAX MD<sup>®</sup> Medical Device Adhesives 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. When cured with DYMAX 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.

UNCURED PROPERTIES *		
Property	Value	Test Method
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Blue Transparent Liquid	N/A
Soluble in	Organic Solvents	N/A
Density, g/ml	1.00	ASTM D1875
Viscosity, cP (20 rpm)	450 nominal	ASTM D1084

CURED MECHANICAL PROPERTIES *		
Property	Value	Test Method
Durometer Hardness	D60	ASTM D2240
Tensile at Break, MPa [psi]	14 [2,000]	ASTM D638
Elongation at Break, %	170	ASTM D638
Modulus of Elasticity, MPa [psi]	120 [17,000]	ASTM D638

OTHER CURED PROPERTIES *		
Property	Value	Test Method
Appearance	Clear	N/A
Refractive Index (20°C)	1.50	ASTM D542
Boiling Water Absorption, % (2 hr)	4.3	ASTM D570
Water Absorption, % (25°C, 24 hr)	4.8	ASTM D570
Linear Shrinkage, %	2.4	ASTM D2566

\* Not Specifications  
 N/A Not Applicable

ADHESION	
Substrate	Recommendation
ABS Acrylonitrile-butadiene-styrene: Lustran <sup>®</sup> , Terluran <sup>®</sup>	✓
PA Polyamide: Nylon 6/6, 12	o
PC Polycarbonate: Makrolon <sup>®</sup> , Lexan <sup>®</sup> , Apec <sup>®</sup> , Calibre <sup>®</sup>	✓
PEBA Polyether-block-amide: PEBAX <sup>®</sup>	✓
PET Polyester Homopolymer: Vectra <sup>®</sup> , Celanex <sup>®</sup>	✓
PMMA Poly (methyl methacrylate): Acrylic, Plexiglass <sup>®</sup> , Perspex <sup>®</sup> , Cyrolite <sup>®</sup>	o
PU Polyurethane: Pellethane <sup>®</sup> , Estane <sup>®</sup>	✓
PVC Polyvinyl chloride	✓

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



**CURING GUIDELINES**

The blue color of DYMAX See-Cure™ products disappears when they are fully cured. Full cure is achieved when additional light exposure does not improve cured properties. The charts below provide information on how long it takes to complete the transition from blue to clear, using different light sources and adhesive thicknesses.

DYMAX Curing System (Intensity)	5000-EC (200 mW/cm <sup>2</sup> ) <sup>A</sup>
Adhesive Thickness, mm [mil]	Time to complete transition, sec <sup>B</sup>
0.10 [4.0]	9
0.20 [8.0]	9
0.41 [16]	10
0.81 [32]	12

DYMAX Curing System (Intensity)	BlueWave <sup>®</sup> 200 (10.0 W/cm <sup>2</sup> ) <sup>A, C</sup>
Adhesive Thickness, mm [mil]	Time to complete transition, sec <sup>B</sup>
0.10 [4.0]	1.5
0.20 [8.0]	1.5
0.41 [16]	1.5
0.81 [32]	1.9

DYMAX Curing System (Intensity)	UVCS Conveyor with Fusion F300 (2.5 W/cm <sup>2</sup> ) <sup>D</sup>
Adhesive Thickness, mm [mil]	Belt speed to complete transition, m/min [ft/min] <sup>B</sup>
0.10 [4.0]	2.1 [7]
0.20 [8.0]	2.1 [7]
0.41 [16]	2.1 [7]
0.81 [32]	1.8 [6]

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

**B** Curing through light blocking substrates may limit the ability of See-Cure™ adhesives to transition from blue to clear and may require longer light exposure at critical wavelengths (320-400 nm for UV light curing; 320-450 nm for UV/visible light curing). These times/speeds are typical for curing through 100% light transmitting substrates.

**C** Due to the distance between the end of the light guide and adhesive, intensity at the curing area was measured as 4.0 W/cm<sup>2</sup>.

**D** 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 the DYMAX ACCU-CAL™ 100 Radiometer.

**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 bond surfaces should be clean and free from grease, mold release, and other contaminants prior to dispensing the adhesive.
3. Cure and color transition speed are 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.
4. Oxygen in the atmosphere may inhibit surface cure. Surfaces exposed to air may require high intensity (>150 mW/cm<sup>2</sup>) UV light to produce a dry surface cure. Flooding the bond 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.
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 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. 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 THE ADHESIVE**

This material may be dispensed with a variety of manual and automatic applicators, or other equipment as required. Questions relating to dispensing and curing systems for specific applications should be referred to DYMAX Applications Engineering.

**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.

**PERFORMANCE AFTER TEMPERATURE EXPOSURE**

DYMAX light curing materials typically have a lower thermal limit of -54°C [-65°F] and an upper limit of 150°C [300°F]. Many DYMAX products can withstand temperatures outside of this range for short periods of time. Please contact DYMAX Applications Engineering if you need further assistance.

**BIOCOMPATIBILITY**

Polymerized DYMAX MD<sup>®</sup> Medical Device adhesives are biocompatibility tested in accordance with ISO 10993 and/or USP Class VI. The completed tests are listed on each product data sheet. Copies of the test reports are available upon request. In all cases, it is the user's responsibility to determine and validate the suitability of these adhesives in the intended medical device. These adhesives have not been tested for prolonged or permanent implantation, and are only intended for use in short-term (<29 days) or single use disposable device applications. DYMAX does not authorize their use in long term implant applications. Customers using these materials for such applications do so at their own risk and take full responsibility for ensuring product safety and biocompatibility.

**STERILIZATION**

Compatible sterilization methods include 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 light. This product may polymerize upon prolonged exposure to ambient and artificial 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.

**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 Material Safety Data Sheet before use.

**RECOMMENDED DYMAX LITERATURE**

<b>LIT010A</b>	Guide to Selecting and Using UV Light Curing Systems
<b>LIT012B</b>	MD <sup>®</sup> Adhesives for Medical Device Assembly
<b>LIT077</b>	Chemical Safety
<b>LIT133</b>	UV Light Curing System Safety Considerations
<b>LIT159</b>	ACCU-CAL™ 50 Radiometer
<b>LIT206</b>	Flood and Focused Beam UV Light Curing Systems
<b>LIT218</b>	BlueWave <sup>®</sup> 200 UV Light Curing Spot Lamp

Literature is available through DYMAX Sales Partners, [www.dymax.com](http://www.dymax.com), or by calling any DYMAX location.

**©2008 DYMAX Corporation**

The data contained in this bulletin is of a general nature and is based on laboratory test conditions. DYMAX does not warrant the data contained in this bulletin. Any warranty applicable to the product, its application and use is strictly limited to that contained in DYMAX's standard Conditions of Sale. DYMAX does not assume responsibility for test or performance results obtained by users. It is the user's responsibility to determine the suitability for the product application and purposes and the suitability for use in the user's intended manufacturing apparatus and methods. The user should adopt such precautions and use guidelines as may be reasonably advisable or necessary for the protection of property and persons. Nothing in this bulletin shall act as a representation that the product use or application will not infringe a patent owned by someone other than DYMAX or act as a grant of license under any DYMAX Corporation Patent. DYMAX recommends that each user adequately tests its proposed use and application before actual repetitive use, using the data contained in this bulletin as a general guide. Rev. 06-24-08