

## See-Cure 1405-M-UR-SC LED-Curable Adhesive for Plastics and Metals

### APPLICATIONS

- Needle Bonding
- Dialyzers
- Winged Infusion Sets
- Collection Sites
- Point of Care Devices
- Safety Sharps
- Combination Devices

### FEATURES

- UV/Visible Light Cure
- Red Fluorescing
- 385-405 nm Cure
- Deeper section cure
- Low Viscosity for Tight Tolerance Applications

### RECOMMENDED SUBSTRATES

- SS
- PC
- PMMA
- ABS

### BIOCOMPATIBILITY

- ISO 10993-5 Cytotoxicity

Dymax MD® Medical Device Adhesive 1405-M-UR-SC is designed to be cured with either 385 nm or 405 nm UV wavelength light sources for very fast bonding of multiple substrates typically used in the manufacture of medical device assemblies. The blue color of Dymax See-Cure products disappears fully when the bond line has been exposed to the proper amount of energy. This product also fluoresces bright red under low-intensity black light (365 nm). The bright red color contrasts extremely well on plastic substrates like PVC and greatly assists with visual inspection of the bond line post cure. Dymax MD® 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 2003/11/EC.

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	1.05	ASTM D1875
Viscosity, cP (20 rpm)	150 (nominal)	DSTM 502

CURED MECHANICAL PROPERTIES *		
Property	Value	Test Method
Durometer Hardness	D70	ASTM D2240
Tensile at Break, MPa [psi]	18.6 [2,700]	ASTM D638
Elongation at Break, %	150	ASTM D638
Modulus of Elasticity, Mpa [psi]	397 [57,600]	ASTM D638

OTHER CURED PROPERTIES *		
Property	Value	Test Method
Appearance	Colorless	N/A
Refractive Index (20°C)	1.51	ASTM D542
Boiling Water Absorption, % (2 h)	4.4	ASTM D570
Water Absorption, % (25°C, 24 h)	3.2	ASTM D570
Linear Shrinkage, %	0.4	ASTM D2566
Glass Transition T <sub>g</sub> , °C	99	DSTM 256 <sup>‡</sup>

\* Not Specifications

N/A Not Applicable

‡ DSTM Refers to Dymax Standard Test Method

ADHESION	
Substrate	Recommendation
ABS acrylonitrile-butadiene-styrene	✓
PC polycarbonate	✓
PCTG poly(cyclohexylene dimethylene terephthalate)glycol	✓
PEI polyetherimide	✓
PETG poly(ethylene terephthalate)glycol	✓
PMMA poly(methyl methacrylate)	✓
PS polystyrene	✓
SAN styrene-acrylonitrile	✓
TPU thermoplastic polyurethane	o
SS stainless steel	✓

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



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## 1405-M-UR-SC Product Data Sheet

## 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>B</sup>
Adhesive Thickness, mm [mil]	Time to complete transition, s <sup>A</sup>
0.10 [4.0]	20
0.20 [8.0]	25
0.41 [16]	30
0.81 [32]	30

Dymax Curing System (Intensity)	BlueWave® 200 (10 W/cm <sup>2</sup> ) <sup>B, E</sup>
Adhesive Thickness, mm [mil]	Time to complete transition, s <sup>A</sup>
0.10 [4.0]	0.6
0.20 [8.0]	0.8
0.41 [16]	1.0
0.81 [32]	1.0

Dymax Curing System (Intensity)	BlueWave® LED DX-1000 (385 nm) Spot or Prime UVA (10 W/cm <sup>2</sup> ) <sup>C, E</sup>
Adhesive Thickness, mm [mil]	Time to complete transition, s <sup>A</sup>
0.10 [4.0]	2
0.20 [8.0]	3
0.41 [16]	4
0.81 [32]	4

Dymax Curing System (Intensity)	BlueWave® LED DX-1000 VisiCure™ (405 nm) Spot (10 W/cm <sup>2</sup> ) <sup>C, E</sup>
Adhesive Thickness, mm [mil]	Time to complete transition, s <sup>A</sup>
0.10 [4.0]	30
0.20 [8.0]	25
0.41 [16]	25
0.81 [32]	4

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>A</sup>
0.10 [4.0]	10
0.20 [8.0]	5
0.41 [16]	3
0.81 [32]	3

**A** 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.

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

**C** Intensity was measured over the UVA/Visible range (250-450 nm) using a Dymax ACCU-CAL™ 50-LED Radiometer.

**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™ 150 Radiometer.

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

## 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 Application Engineering.

## 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 of removal.

## PERFORMANCE AFTER TEMPERATURE EXPOSURE

Dymax light-curable 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 Application Engineering if you need further assistance.

**BIOCOMPATIBILITY**

Polymerized Dymax MD® 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 six-month shelf life from date of shipment, unless otherwise specified, 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.