

3 December 2004

UV CURING POSITIONING Low Shrink™ OPTICAL ADHESIVE OP-61-LS

INTRODUCTION

DYMAX high performance optical adhesives cure upon exposure to UV or visible light in seconds. Because of their solvent-free and rapid cure features, they increase productivity, lower assembly cost and enhance worker safety. When cured with DYMAX spot, beam or flood lamps, they deliver optimum speed and performance for a variety of optical applications.

DESCRIPTION

DYMAX "Low Shrink™" adhesives are from a patented technology that significantly reduces shrinkage and movement of positioning adhesives both during UV curing and during service life conditions. DYMAX OP-61-LS offers very low shrinkage, low outgassing, low CTE adhesives improvements OP-61, suggesting its use in the accurate positioning of lenses, prisms, fibers and other optical components. OP-61-LS was designed not to move or shrink during UV curing. Laboratory tests show minimal movement during heat cycles and to return to original position at room temperature. DYMAX OP-61-LS cures completely in seconds upon exposure to either UV or visible (blue) light.

- SUBSTRATES BONDED:** • Glass • Metal • Plastics
- FEATURES:** • Low-to-No Movement from Curing • Low Movement During Thermal Excursions
- APPLICATIONS:** • Low Outgassing
- Lens and Prism Positioning

TYPICAL UNCURED PROPERTIES

	<u>OP-61-LS</u>	
Solvent Content	None - 100% Solids	
Composition	Urethane (Meth) Acrylate	
Appearance	White To Off-White Paste	
Solubility	Alcohols/Ketones	
Toxicity	Low	
Flash Point	>93.3°C (200°F)	
Density	1.2 g/mL	ASTM D-1875
Viscosity (Brookfield, 25°C, 20 rpm)	60,000 cP (nominal)	ASTM D-2556

TYPICAL CURED PROPERTIES

Linear Shrinkage	< 0.1% (during UV Cure)	ASTM D-2566
	< 0.1% (after 24 hr, 120°C)	ASTM D-2566
Tensile at Break	7,300 psi	ASTM D-638
Compression/shear, glass to glass	3,800 psi	
Elongation at Break	0.4%	DSTM D-250*
Modulus of Elasticity	2,000,000 psi	ASTM D-638
Glass Transition, T _g	65°C	ASTM E-831
CTE α ₁ (below T _g)	27 x 10 ⁻⁶ in/in/°C	ASTM E-831
CTE α ₂ (above T _g)	120 x 10 ⁻⁶ in/in/°C	ASTM E-831
CTE (-50°C to 200°C)	74 x 10 ⁻⁶ in/in/°C	ASTM E-831
Durometer Hardness	D90	ASTM D-2240
Water Absorption (24 hr)	1.3%	ASTM D-570
Thermal Limit (brittle/degrades)	-45° to 180°C (-50° to 350°F)	DSTM D-200*

* DSTM refers to DYMAX Standard Test Method

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DYMAX CORPORATION

PRODUCT DATA SHEET

OP-61-LS, 3 December 2004

RECOMMENDED CURING SYSTEMS

Lamp	Bond Box	5000-EC	BlueWave200	Cure Spot 50
Light Type	UV/Visible	UV/Visible	UV/Visible	UV/Visible
Lamp Type	8" Rotating stage	5" x 5" Flood	3/16" Spot	3/16" Spot
Maximum Lamp Intensity @ 365 nm	150 mW/cm ²	300 mW/cm ²	20000 mW/cm ²	5000 mW/cm ²
Intensity @ time of test @ 365 nm	50 mW/cm ²	150 mW/cm ²	18000 mW/cm ²	2500 mW/cm ²
Adhesive Absorption Range (nm)	300-500	300-500	300-500	300-500
Equipment Output Range (nm)	300-500	300-500	300-500	300-500
Typical Cure speed (seconds)				
Fixture between glass slides	2	1	<1	1
1/16 inch bead	10	<5	<5	7
Tack free surface cure	10	<5	1	3

The required intensity and cure time should be determined during the initial process validation stage. Factors that should be considered during process validation which can affect the adhesive cure rate and depth of cure include: part geometry, bond-gap size, percent light transmittance through the substrate at 365 nm and/or 436 nm, distance from the light source to the adhesive bond area, UV and visible light intensity and spectral output of the light source, the desired margin of safety to be built into the process, etc. For specific technical recommendations relating to the application, please call the DYMAX Technical Center at (860) 482-1010.

STORAGE AND SHELF LIFE

Store material in a cool, dark place when not in use. Do not expose to UV light or sunlight. Material may polymerize upon prolonged exposure to ambient light. Replace lid immediately after use. When stored below 90°F in the original, unopened container, the shelf life is six-months except for 3-mL and 5-mL package sizes which have a one-year shelf life.

DISPENSING AND HANDLING ADHESIVE

DYMAX OP-61-LS is available in 3-mL, 5-mL, 10-mL, and 30-mL manual or machine ready syringes. They 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 to the DYMAX Technical Center at (860) 482-1010.

SAFETY

Wear impervious gloves and/or barrier cream. Repeated or continuous skin contact with liquid adhesive will cause irritation and should be avoided. Do not wear absorbent gloves. Remove adhesive from skin with soap and water. Never use solvents to remove adhesive from skin or eyes.

CAUTION

For industrial use only. Avoid breathing vapors. Avoid contact with eyes and clothing. In case of contact, immediately flush with water for at least 15 minutes; get medical attention. Wash clothing before reuse. Keep out of reach of children. Do not take internally. If swallowed, induce vomiting at once and call a physician. Repeated or continuous skin contact with liquid adhesive will cause irritation and should be avoided. For specific information, refer to the product's Material Safety Data Sheet.

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