

### HIGH $T_g$ LIGHT PATH ADHESIVES Fiber Optical Assembly OP-4-20632 SERIES

#### INTRODUCTION

DYMAX high performance optical adhesives cure upon exposure to UV light in seconds and are designed to increase productivity, lower assembly cost and enhance worker safety. These results were obtained using very high speed DYMAX spot, beam and flood lamps. DYMAX lamps deliver optimum speed and performance for a variety of optical applications.

#### DESCRIPTION

Ultra Light-Weld® OP-4-20632 Series are clear, UV-curable adhesives designed for durable bonding of fiber optic couplings. OP-4-20632 Series were designed for maximum resistance to yellowing and maintain its dimensions when thermally cycled. OP-4-20632 Series have high bond strength to optical glass and most metals. Although the product fully cures in seconds upon UV or visible light exposure, heating the UV cured product to 150°C for 1 hour will increase the  $T_g$  to 100°C and may further improve bond strength.

<b>FEATURES:</b>	<ul style="list-style-type: none"> <li>• Low Shrinkage UV Cure (&lt;0.2%) With High Optical Clarity 300-1800 nm</li> <li>• High Strength Bond Resists Yellowing</li> <li>• High Glass Transition Temperature (<math>T_g</math>)</li> <li>• Good Thermal Cycling With Minimal Degradation of Optics or Strength</li> </ul>
<b>APPLICATIONS:</b>	<ul style="list-style-type: none"> <li>• Bonding, Fiber Optic Couplings and Prisms</li> </ul>

#### TYPICAL UNCURED PROPERTIES (not specifications)

Solvent Content	None-100% Reactive Solids	
Composition	Acrylate	
Appearance	Optically Clear	
Solubility	Alcohols/Ketones/Chlorinated Solvents	
Toxicity	Low	
Flash Point	Over 93°C (>200°F)	
Refractive Index, $n_D^{20}$	1.522	ASTM D-1218
Viscosity, (Brookfield, 25°C, 20 rpm)	OP-4-20632 500 cP	ASTM D-1084
	OP-4-20632-GEL 50,000 cP (thixotropic gel)	ASTM D-2556
	OP-4-20632-H 500 cP	ASTM D-2556

#### TYPICAL CURED PROPERTIES (not specifications)

Linear Shrinkage, after UV cure	0.2%	ASTM D-2566
Refractive Index, $n_D^{20}$	1.554	ASTM D-1218
Glass Transition, $T_g$	100°C (UV cure and heat)	ASTM E-831
Glass Transition, $T_g$	50°C (UV cure without heat)	ASTM E-831
CTE $\alpha_1$ (below $T_g$ )	45 x 10 <sup>-6</sup> in/in/°C	ASTM E-831
CTE $\alpha_2$ (above $T_g$ )	110 x 10 <sup>-6</sup> in/in/°C	ASTM E-831
CTE (-50°C to 200°C)	91 x 10 <sup>-6</sup> in/in/°C	ASTM E-831
Durometer Hardness	D75	ASTM D-2240
Tensile at Break	8,900 psi	ASTM D-638
Modulus of Elasticity	800,000 psi	ASTM D-638
Elongation at Break	2%	ASTM D-638
Tensile Compression Shear, glass to glass	2,200 psi (exceeds glass strength)	DSTM D-250*
Thermal Range (brittle/degrades)	-55° to +200°C (-65 to 400°F)	DSTM D-200*
24 hr Water Absorption	1.0 %	ASTM D-570
2 hr Boiling Water Absorption	1.2%	ASTM D-570

\*DSTM Refers to DYMAX Standard Test Method

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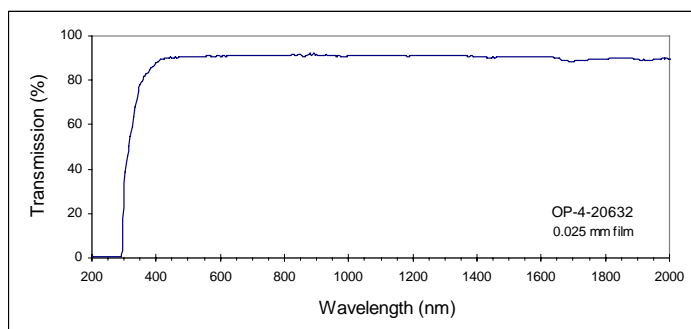
# DYMAX CORPORATION

## PRODUCT DATA SHEET

OP-4-20632 Series, 5/15/06

### CURE DATA

Lamp	DYMAX <sup>®</sup> 2000-EC	DYMAX <sup>®</sup> 5000-EC	DYMAX <sup>®</sup> Bond Box	DYMAX <sup>®</sup> Blue Wave 50	ADAC 50
Light Type	UV/Visible	UV/Visible	UV/Visible	UV/Visible	UV/Visible
Lamp Type	8" x 8" Flood	5" x 5" Flood	8" Rotating stage	3/16" Spot	3/16" Spot
Maximum Lamp Intensity @ 365 nm	50 mW/cm <sup>2</sup>	300 mW/cm <sup>2</sup>	150 mW/cm <sup>2</sup>	4,000 mW/cm <sup>2</sup>	4,000 mW/cm <sup>2</sup>
Intensity @ time of test @ 365 nm	20 mW/cm <sup>2</sup>	150 mW/cm <sup>2</sup>	50 mW/cm <sup>2</sup>	2,500 mW/cm <sup>2</sup>	2,500 mW/cm <sup>2</sup>
Adhesive Absorption Range (nm)	300-400	300-400	300-400	300-400	300-400
Equipment Output Range (nm)	300-500	300-500	300-500	300-500	300-500
Typical Cure speed (seconds)					
Fixture between glass slides	1	1	1	1	1
Tack-free surface cure	1	1	1	1	1
1/16-inch bead	3	3	3	3	3



### STORAGE & 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. Product has a one-year shelf life when stored below 90°F in the original, unopened container.

### DISPENSING & HANDLING ADHESIVE

DYMAX OP-4-20632 Series adhesives are available in 3-mL, 5-mL, 10-mL and 30-mL manual or machine ready syringes and 170-mL cartridges. Machine ready syringes may be dispensed from a variety of automatic bench-top syringe applicators or other equipment as required. Any questions relating to dispensing and curing systems for specific applications should be referred 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; for eyes, get medical attention. Wash clothing before reuse. Keep out of reach of children. Do not take internally. If swallowed, vomiting should be induced at once and a physician called. For specific information, refer to the Material Safety Data Sheet before use.

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