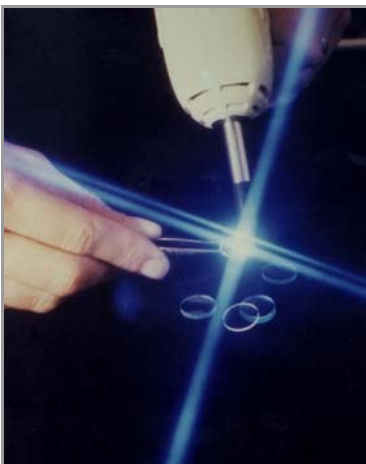


# UV Light Curing Lens-Bonding Adhesives

## Precision Bonding, Mounting, and Fixturing

DYMAX OP Series of optically clear, high-strength, low-stress optical assembly adhesives cures in seconds upon exposure to UV/Visible light. DYMAX optical adhesives are single component, low outgassing, low shrinkage, and have a gap filling capability to 6.4 mm ( $\frac{1}{4}$  inch) or more, as well as long room-temperature shelf life. UV-curing optical adhesives are ideal for applications such as lens mounting, fiber optic bonding and splicing, lens laminating, optoelectronic assembly, and the attachment of ceramic, glass, quartz, metal, and plastic components.



Lens Curing



Lens Positioning

### FEATURES and BENEFITS

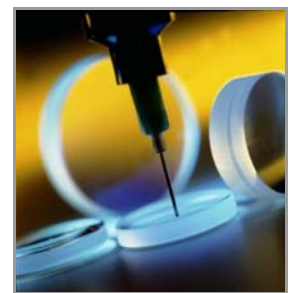
- Higher strength with low stress
- Low shrinkage/no movement
- Environmentally resistant
- Fast UV/Visible curing
- Low odor
- Single component, no mixing is required
- Cure only when exposed to light
- Room temperature storage
- Low outgassing
- Gap filling to 6.4 mm [0.25 in] or more
- No VOCs

DYMAX offers a complete line of high-performance UV adhesives and light curing equipment for optical applications for the industrial, commercial, medical, military, aerospace, and electro-optical markets. With a library of over 3,000 formulations, we can match adhesive characteristics to particular application needs. Over 25 years of experience in this industry has led to a superior product line of adhesives, applicators, and UV-curing sources.

Visit [www.dymax.com](http://www.dymax.com) to register to download the white paper "Advances in Light-Curing Adhesives"



Diode Curing



Lens Bonding



Prism Curing



Lens Laminating

# Product Selector Guide

Products	Characteristics	Recommended Substrates			Additional Uses			ASTM D542
		Metal	Glass	Plastic	Doublets	Lens Mounting	Fiber Optic Splicing	Refractive Index (cured)
<b>Doublet (glass to glass) Bonding/Excellent Transmission</b>								
<b>OP-29*</b>	Multi-purpose	✓	✓	✓	✓	✓	✓	1.504
<b>OP-29V*</b>	Multi-purpose, visible light curing	✓	✓	✓	✓	✓	✓	
<b>OP-29V-Gel</b>	Multi-purpose, visible light curing	✓	✓	✓	✓	✓	✓	
<b>OP-30*</b>	Low stress, flexible, multi-purpose; visible light curing	✓	✓		✓	✓	✓	1.507
<b>OP-21*</b>	Multi-purpose plastic bonder; high viscosity		✓	✓	✓	✓	✓	1.501
<b>OP-21G</b>			✓	✓	✓	✓	✓	
<b>Lens, Prism, Optic Mounting</b>								
<b>OP-29V*</b>	Multi-purpose; visible light curing	✓	✓	✓	✓	✓	✓	1.504
<b>OP-30*</b>	Low stress; flexible; multi-purpose	✓	✓		✓	✓	✓	1.507
<b>OP-61-LS*</b>	Metal/glass bonding; low shrinkage, low outgassing for alignment stability	✓	✓			✓		White Opaque
<b>OP-67-LS</b>	Low shrinkage for alignment stability	✓	✓	✓		✓		Beige Opaque
<b>OP-24-Rev.B (501-E)</b>	Multi-cure; UV/light/heat/activator; tack and bond with UV or with heat or activator where light won't reach	✓	✓			✓		1.502
<b>Flexible Laminating</b>								
<b>OP-40</b>	Eyeglass lens laminating; potting in metal mounts; glass/metal, CR-39	✓	✓	✓				1.495
<b>OP-44</b>	Plastic sunglass lens laminating; bonds to PVA, CR-39 & CAP		✓	✓				1.477
<b>OP-45</b>	Flexible lens bonder; provides UV blocking to 410 nm.		✓	✓				1.478
<b>Fiber Optic Adhesives</b>								
<b>OP-52</b>	Medium viscosity grade for butt bonding, bundling and splitting	✓	✓				✓	1.520
<b>OP-54*</b>	Low viscosity wicking grade for butt bonding, bundling and splitting	✓	✓				✓	1.506
<b>Temporary Fixturing</b>								
<b>OP-18</b>	Temporary fixturing; peels off easily; replaces tape, waxes for blocking or fixturing	✓	✓	✓		✓		1.501
<b>OP-19</b>	Water soluble for temporary fixturing and polishing	✓	✓	✓	✓	✓		N/A
<b>OP-19G</b>								

\*Available in Adhesive Assortment Kit. Cyanoacrylates are available upon request. See Product Data Sheets for curing suggestions.

# Typical Adhesive Properties

Products	Viscosity (cP)	Linear Shrinkage	Durometer (hardness)	ASTM E595-77 Outgassing Data 85°C at 5x10 <sup>6</sup> Torr for 24 hours TWL <sup>1</sup> /CVCM <sup>2</sup>	ASTM D638 Adhesive Film % Elongation	ASTM D638 Adhesive Film Tensile (psi)	ASTM D638 Adhesive Film Modulus (psi)	DSTM 251 Lap Shear glass-to-glass compression/ **tensile (psi)	DSTM 251 Lap Shear glass-to-metal compression /**tensile (psi)	ASTM D-1002 Lap Shear steel-to-steel tensile (psi)
<b>Doublet (glass to glass) Bonding/Excellent Transmission</b>										
OP-29* OP-29V* OP-29V-Gel	2,500 2,500 110,00	2.8%	D60	3.66% 0.25%	120%	3,000	35,000	2,300	1,700	2,100 <sup>‡</sup>
OP-30*	300	2.3%	D25	nm	100%	900	3,000	925	600	1,200
OP-21* OP-21G	600 25,000	2.7%	D55	nm	175%	1,700	26,000	1,200 **2,700 (Polycarbonate)	900 **1,400 (Acrylic; PMMA)	900 <sup>‡</sup>
<b>Lens, Prism, Optic Mounting</b>										
OP-29V*	2,500	2.8%	D60	nm	120%	3,000	35,000	2,300	1,700	2,100 <sup>‡</sup>
OP-30*	300	2.3%	D25	nm	100%	900	3,000	925	600	1,200
OP-61-LS*	60,000	<0.1%	D85	1.22% <0.02%	0.4%	7,300	2,000,000	3,800	nm	nm
OP-67-LS	135,000	<0.1%	D80	nm	6.5%	4,000	83,000	nm	nm	nm
OP-24-Rev.B (501-E)	800	3.7%	D80	5.2% 0.04%	35%	5,200	320,000	4,000	5,000	2,900
<b>Flexible Laminating</b>										
OP-40	135	3.4%	D40	nm	160%	1,300	3,000	1,950	1,330	2,200 <sup>‡</sup>
OP-44	190	2.9%	D65	nm	62%	2,300	23,000	2,900	nm	nm
OP-45	1,200	3.2%	A20	nm	150%	325	19,000	702	nm	nm
<b>Fiber Optic Adhesives</b>										
OP-52	5,000	1.9%	D85	3.72% 0.05%	4.5%	11,000	500,000	800	3,000	3,200 <sup>‡</sup>
OP-54*	100	1.8%	D82	nm	3%	7,500	500,000	2,900	570	3,100 <sup>‡</sup>
<b>Temporary Fixturing</b>										
OP-18	48,000	2.0%	A75	N/A	100%	500	850	N/A	N/A	300 <sup>‡</sup>
OP-19 OP-19G	6,000 20,000	N/A	D70	N/A	100%	N/A	N/A	N/A	N/A	N/A

N/A = data not applicable    nm = data not measured    1 TWL=Total Weight Loss    2 CVCM = Volatile Condensable Material

<sup>‡</sup> = These products are commercially available for UV/Visible light curing only. Test data for comparative purposes via ASTM D-1002 was achieved by addition of a thermal initiator for activator and heat cure (15 minutes at 130°C [270°F]).

# UV Light Curing Systems for Optical Adhesives

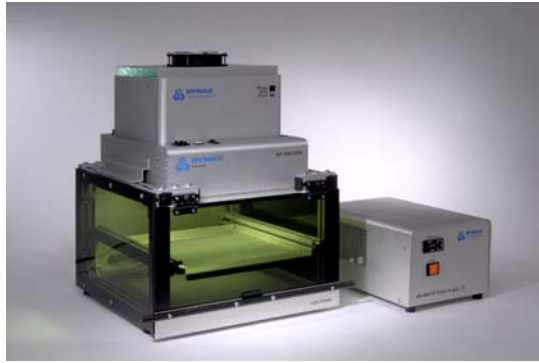
Tired of short storage and shelf life, of mixing two components, and waiting for adhesives to thaw? DYMAX UV light curing adhesives and systems cure completely in seconds. **Make automation easier!**



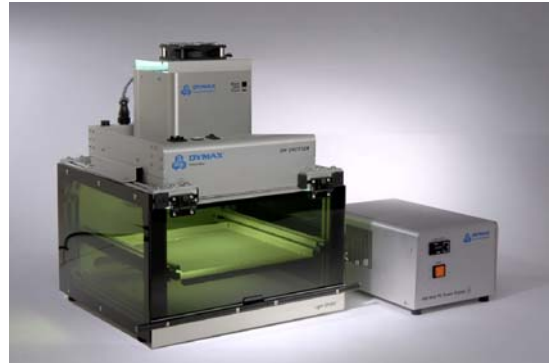
**DYMAX BlueWave® 200 UV Curing Spot Lamp** with patent-pending intensity adjustment feature provides high-intensity UV/Visible light in a concentrated area. Ideal for integration with automated equipment and multiple-output lightguides. **CE Marked.**



**DYMAX BlueWave® 50 UV Curing Spot Lamp** provides the optimal combination of low operating cost with sufficient intensity output to accommodate a majority of bonding applications. **CE Marked.**



**DYMAX 2000-PC UV Curing Flood Lamp System** Shown with Light Shield protective enclosure and manual shutter. Ideal for single-component or batch-curing processes requiring moderate intensity and an 8" x 8" (20.3 cm x 20.3 cm) cure area. **CE Marked.**



**DYMAX 5000-PC UV Curing Flood Lamp System** Shown with Light Shield protective enclosure and ZIP™ shutter. Ideal for single-component or batch-curing processes requiring moderate intensity and a 5" x 5" (12.7 cm x 12.7 cm) cure area. **CE Marked.**

For further assistance with adhesive and equipment selection, contact your DYMAX Applications Engineer.



In Europe Call: +49 (0) 69 / 7165-3568  
In the U.S. Call: 877.396.2988  
In North and South America Call: 860.482.1010  
In Asia Call: +852.2460.7038

[www.dymax.de](http://www.dymax.de)  
[www.dymax.com](http://www.dymax.com)  
[www.dymax.com.cn](http://www.dymax.com.cn)

**DYMAX Europe GmbH** - Trakehner Strasse 3 - D-60487 Frankfurt am Main - Germany - Phone: +49 (0) 69 / 7165-3568 - Fax: +49 (0) 69 / 7165-3830 - E-mail: [dymaxinfo@dymax.de](mailto:dymaxinfo@dymax.de) - [www.dymax.de](http://www.dymax.de)

**DYMAX Corporation** - 318 Industrial Lane - Torrington, CT 06790 - Phone: 860-482-1010 - Fax: 860-496-0608 - E-mail: [info@dymax.com](mailto:info@dymax.com) - [www.dymax.com](http://www.dymax.com)

**DYMAX UV Adhesives & Equipment (Shenzhen) Ltd** - Unit 807, Talfook Building, No. 9 Shi Hua Road, Futian Free Trade Zone, Shenzhen, China 518038 - Phone: +86.755.83485759 - Fax: +86.755.83485760 - E-mail: [dymaxasia@dymax.com](mailto:dymaxasia@dymax.com) - [www.dymax.com.cn](http://www.dymax.com.cn)

**DYMAX Asia (HK)** - Unit 1006, 10/F., Carnarvon Plaza, No. 20, Carnarvon Road, T.S.T., Kowloon, Hong Kong - Phone: +852-2460-7038 - Fax: +852-2460-7017 - E-mail: [dymaxasia@dymax.com](mailto:dymaxasia@dymax.com) - [www.dymax.com.cn](http://www.dymax.com.cn)

© 2001, 2007, 2009 DYMAX Corporation. All rights reserved. All trademarks in this guide, except where noted, are the property of, or used under license by DYMAX Corporation, U.S.A.

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 test its proposed use and application before actual repetitive use, using the data contained in this bulletin as a general guide. LIT163EU Rev. 2/10/2009