



## OP-60

### Precision Positioning Optical Adhesive

#### APPLICATIONS

- Optical Alignment Where Minimal or No Movement is Required

#### FEATURES

- High-Strength Positioning Adhesive
- Low Outgassing
- Low Shrinkage
- Low Moisture Absorption
- Opaque
- Heat-Cycle Stable
- Non-Movement During Cure or Thermal Excursions
- Complete Cure in Seconds

#### RECOMMENDED SUBSTRATES

- Glass
- Metal
- Ceramic
- FR-4
- Polycarbonate

Dymax OP-60 is a low-shrinkage, low-outgassing, low-CTE adhesive designed for the precise positioning of lenses, prisms, and other optical components. OP-60 cures by exposure to ultraviolet and/or visible cure light. 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. This product is in full compliance with RoHS directives 2015/863/EU.

#### TYPICAL UNCURED PROPERTIES \*

| Property  | Value              | Test Method |
|---|--------------------|-------------|
| Solvent Content   | None - 100% Solids | N/A         |
| Appearance  | Light Yellow Paste | N/A         |
| Viscosity, cP (20 rpm)  | 150,000 (nominal)  | ASTM D2556  |
| Chemical Class  | Acrylated Urethane | N/A         |
| Soluble in  | Organic Solvents   | N/A         |
| Density, g/ml   | 1.59               | ASTM D1875  |
| Shelf Life at Recommended Conditions from Date of Manufacture | 18 months          | N/A         |

#### OTHER CURED PROPERTIES \*

| Property                             | Value | Test Method |
|--------------------------------------|-------|-------------|
| Total Weight Loss (TWL)              | 1.66% | ASTM E595   |
| Volatile Condensable Material (CVCM) | 0.10% | ASTM E595   |

#### TYPICAL CURED PROPERTIES \*

| Property                              | Value                                   | Test Method |
|---------------------------------------|---|-------------|
| Linear Shrinkage During Cure          | 0.8%                                    | ASTM D-2566 |
| Durometer Hardness                    | D80                                     | ASTM D-2240 |
| Elongation at Break                   | 2.4%                                    | ASTM D-638  |
| Tensile at Break                      | 4,900 psi                               | ASTM D-638  |
| Modulus of Elasticity                 | 146,250 psi                             | ASTM D-638  |
| Water Absorption (24 h)               | 2.8%                                    | ASTM D-570  |
| Coefficient of Thermal Expansion, CTE | 58 X 10 <sup>-6</sup> in/in/°C (58 ppm) | ASTM D-696  |
| Dielectric Strength                   | 600 V/mil                               | ASTM D-149  |
| Volume Resistivity                    | 76.4 x 10 <sup>12</sup> ohm-cm          | ASTM D-257  |
| Dissipation Factor, 1 MHz             | 0.02                                    | ASTM D-150  |
| Dielectric Constant, 1 MHz            | 4.6                                     | ASTM D-150  |

\* Not Specifications

N/A Not Applicable

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Technical Data Collected PRIOR TO 2003 Rev. 02/10/2023





## CURING GUIDELINES

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm<sup>2</sup> [10 psi] between glass slides. Actual cure time typically is 3-to-5 times fixture time.

| Dymax Curing System (Intensity)                                       | Fixture Time or Belt Speed <sup>A</sup> |
|---|---|
| 2000-EC (50 mW/cm <sup>2</sup> ) <sup>B</sup>                         | 2 s                                     |
| 5000-EC (200 mW/cm <sup>2</sup> ) <sup>B</sup>                        | 1 s                                     |
| BlueWave® 200 (10 W/cm <sup>2</sup> ) <sup>B</sup>                    | 1 s                                     |
| UVCS Conveyor with Fusion F300S (2.5 W/cm <sup>2</sup> ) <sup>D</sup> | 7.9 m/min [26 ft/min]                   |

<sup>A</sup> Fixture times/belt speeds are typical for curing thin films through 100% UV and light-transmitting substrates. Light-obstructing substrates may require longer cure times.

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

<sup>D</sup> 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™ 6 Radiometer.

Full cure is best determined empirically by curing at different times and intensities, and measuring the corresponding change in cured properties such as tackiness, adhesion, hardness, etc. Full cure is defined as the point at which more light exposure no longer improves cured properties.

Dymax recommends that customers employ a safety factor by curing longer and/or at higher intensities than required for full cure. Although Dymax Application Engineering can provide technical support and assist with process development, each customer must ultimately determine and qualify the appropriate curing parameters required for their unique application.

## DISPENSING SUPPORT

The Dymax Application Engineering team is ready to discuss your application requirements to provide the most appropriate dispensing and/or spraying solution. Visit our current dispensing equipment portfolio [here](#) or consult our [global contact](#) phone numbers and online chat feature (available in North America only) during normal business hours for instant support.

## 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. This material shelf life noted on page 1 of this document, 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 Safety Data Sheet before use.

The data provided in this document are based on historical testing that Dymax performed under laboratory conditions as they existed at that time and are for informational purposes only. The data are neither specifications nor guarantees of future performance in a particular application. Dymax does not guarantee that this product's properties are suitable for the user's intended purpose.

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