**Product Information**
Lighting

DOW CORNING

# *Dow Corning*® OE-6450 Optical Encapsulant

## FEATURES & BENEFITS

- Two part LED gel
- No by-product
- Solventless
- Low viscosity
- Low moisture absorption
- High reflactive index
- High transparency
- Excellent thermal stability
- Excellent dielectric properties
- Excellent stress reduction
- Low Young's modulus

## COMPOSITION

- Methylphenyl Siloxane

Two-part, solventless, high purity, heat cure, protective silicone coating

## APPLICATIONS

- *Dow Corning*® OE-6450 Optical Encapsulant is suitable for encapsulation of LEDs

## TYPICAL PROPERTIES

Specification Writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

| Property | Unit | Result |
|---|---|---|
| One or Two-Part | - | Two |
| Mix Ratio | - | 1 to 1 |
| Viscosity (Part A) | cP | 2,700 |
| | Pa-sec | 2.7 |
| Viscosity (Part B) | cP | 1,200 |
| | Pa-sec | 1.2 |
| Viscosity (Mixed) | cP | 1,700 |
| | Pa-sec | 1.7 |
| Specific Gravity Cured | - | 1.12 |
| Heat Cure Time at 100 °C | minutes | 60 |
| Pot Life | hours | 3 |
| Penetration | 1/10 mm | 45 |
| Youngs Modulus | psi | 4 |
| | MPa | 0.003 |
| | kg/cm2 | 0.3 |
| Impurity (Na+) | ppm | 0.2 |
| Impurity (K+) | ppm | 0.2 |
| Impurity (Cl-) | ppm | 1 |
| Volume Resistivity | ohm*cm | 2E+15 |
| Dielectric Strength | volts/mil | 1000 |
| | kV/mm | 39 |
| Dielectric Constant at 1 MHz | - | 1.7 |
| Dissipation Factor at 1 MHz | - | 4E-03 |
| Refractive Index | - | 1.54 |
| Hardening Transition by DSC | ºF | -9 |
| | ºC | -23 |
| Flash Point | ºF | 471 |
| | ºC | 244 |
| Transparency at 450 nm, 1 mm thick | % | 99 |

## DESCRIPTION

*Dow Corning*® brand silicone LED (light emitting diode) encapsulants are designed to meet the challenging needs of the LED market, including high adhesion, high purity, moisture resistance, thermal stability and optical transmittance. Silicone materials can absorb stresses caused by thermal cycling inside the package, protecting the chip and the bonding wires. And with the electronics industry quickly

moving toward lead-free processing, silicone encapsulants, with their demonstrated, excellent stability at reflow temperatures, are a natural fit for LED applications.

## APPLICATION METHODS

- Compatible with commercially available equipment and industry standard processes

## PREPARING SURFACES

Surfaces should be clean and dry. Recommended cleaning methods include *Dow Corning*® brand OS Fluids, naphtha, mineral spirits, methyl ethyl ketone (MEK) or other suitable solvent. Rougher surfaces tend to promote adhesion of silicones to other surfaces.

## PROCESSING/CURING

These products are also compatible with commercially available equipment and industry standard processes. These materials can be dispensed or molded depending on the product and application. *Dow Corning* OS Fluids are recommended to clean cured or uncured silicone residue from application equipment.

## ADHESION

*Dow Corning* LED materials are specially designed for adhesion to commonly used LED substrates. Surface treatments such as chemical etching or plasma treatment may provide a reactive surface and improve adhesion to these types of substrates. In general, increasing the cure temperature and/or cure time will improve the ultimate adhesion.

## USEFUL TEMPERATURE RANGES

For most uses, silicone encapsulants and resins should be operational over a temperature range of -45 to 200 °C (-49 to 392 °F) for long periods of time. However, at both the low- and high-temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations. For low-temperature performance, thermal cycling to conditions such as -55 °C (-67 °F) may be possible, but performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history. At the high-temperature end, the durability of the cured silicone elastomer is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

## COMPATIBILITY

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of addition cure adhesives. Most notable of these include: organotin and other organometallic compounds, silicone rubber containing organotin catalyst, sulfur, polysulfides, polysulfones or other sulfur containing materials, unsaturated hydrocarbon plasitcizers, and some solder flux residues. If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a small scale compatibility test be run to ascertain suitability in a given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

## HANDLING PRECAUTIONS

**PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE ON THE DOW CORNING WEB SITE AT DOW CORNING.COM, OR FROM YOUR DOW CORNING SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CORNING CUSTOMER SERVICE.**

## USABLE LIFE AND STORAGE

Shelf life is indicated by the "Use Before" date found on the product label. Dow Corning two-part products should be stored at or below 25 °C (77 °F). Containers should be kept tightly closed at all times to extend shelf life. Check the product label for specific storage conditions.

## LIMITATIONS

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

## HEALTH AND ENVIRONMENTAL INFORMATION

To support Customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, dowcorning.com or consult your local Dow Corning representative.

## LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

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