Consumer Solutions

Silicone Assembly Sealant Speeds Up Production of Automotive Lighting Systems

Case Study

Customer

Our customer is recognized worldwide for innovating in the development and production of lighting systems for the transportation industry.

Challenge

To meet customer needs for improved production of lamp assemblies, two years of performance validation are required to gain vehicle-OEM acceptance of a new sealing solution.

Solution

DOWSIL™ HM-2510 Assembly Sealant, with instant green strength, helps shorten production cycle time, improve productivity, and save labor and material.

SMART SCIENCE DRIVES MOBILITY INNOVATION™

Moving toward becoming the largest manufacturer of automotive lighting systems in its region, one Dow customer is meeting an industry challenge for faster, higher-quality and more economical lamp production with the help of DOWSIL™ HM-2510 Assembly Sealant. On the company's automated lamp-assembly lines, the silicone sealant provides immediate adhesion between the lamp housing and lens. Its high green strength allows assembly air-pressure leak testing without process interruption for additional cure time.

The Opportunity

Located in the heart of its country's automotive manufacturing region, our customer provides just-in-time production for the country's largest vehicle OEMs, even making hourly deliveries. The company's main products include headlamps, flashers, tail lamps and brake lights for passenger cars, light-duty trucks, and heavy commercial vehicles such as buses and trucks. In addition, it supplies the serviceparts market nationally and internationally.

For many years, the company used DOWSIL 7091 Adhesive Sealant, as well as other silicone and polyurethane options, for lamp assembly sealing. These sealants required up to 12 hours of curing before pressure-leak testing. The additional steps lengthened production cycle times, required inventory space, and impacted costs and cashflow.

The Challenge

Our customer needed a sealant that would shorten the production cycle but also would meet the stringent technical requirements of their vehicle-OEM customers. Up to two years of performance validation were required to gain approval for using a different sealing solution. This included comprehensive laboratory tests on materials; field tests on assembly performance; and numerous customer presentations and technical meetings on the options, test results and potential advantages.

Our customer's application engineers conducted the needed validation work, comparing the properties and performance of DOWSIL HM-2510 Assembly Sealant with other adhesives, polyurethane sealants and the OEM-approved silicone sealants.

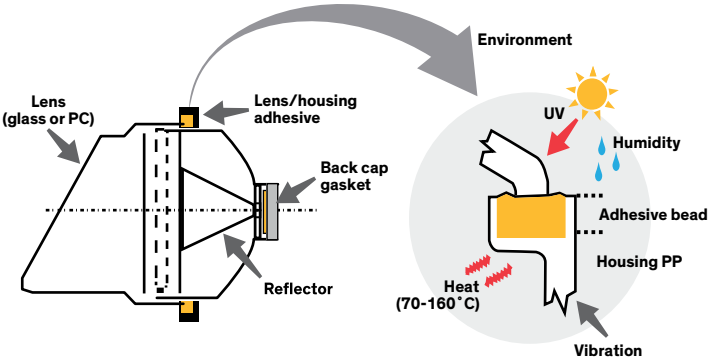
The Solution

As validation work proved, DOWSIL HM-2510 Assembly Sealant outperformed other adhesives on initial and long-term adhesion, as well as service temperature range. Polyurethanes provided acceptable adhesion, but they fell short on high temperature adhesion and usually needed curing before testing.

DOWSIL™ HM-2510 Assembly Sealant provided immediate green strength to allow in-line air-pressure leak testing for quality control. Fully cured, the waterclear silicone sealant withstands heat up to 150°C (300°F) and cold down to -45°C (-50°F). It has advantages in processability and resistance to ultraviolet (UV) light, humidity and vibration.

"This change in sealants shortens our customer's assembly production cycle time, improves process productivity, and helps with gains in both labor and material savings," said Alexandre Lembi, Application Engineering and Technical Services for Dow. "Our customer also can eliminate several assembly screws because of the long-term adhesion strength of the silicone sealant."

Weathering: Adhesives for Headlamps



Silicone Assembly Sealant Advantages

DOWSIL HM-2510 Assembly Sealant offers:

- Immediate green strength to allow parts processing without delays
- Durable, strong adhesion to most substrates
- Easy application with long open time, pot life and moderate heat [121°C (250°F)]
- High viscosity at room temperature to resist flow, reducing sealant squeeze-out and cleanup
- Low volatile organic compounds (VOCs), low odor and nonhazardous by-products
- Use with standard automated dispensing equipment
- Moisture curing at ambient temperatures
- Low specific gravity of 1.07, versus 1.3 to 1.4 for polyurethane
- Good physical properties and long-term weathering resistance
- May result in lower material use requirements based on application design and manufacturing process

Learn More: Contact Us

To learn more about using DOWSIL HM-2510 Assembly Sealant for automotive applications, contact your Dow Technical Representative, visit **consumer.dow.com/auto** or send an email via **consumer.dow.com/contactus**.

Images: Front – dow_40268223746; Back – dow_40387235187

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