

HEADLAMP ADHESIVE TECHNOLOGY



From Product Design
Through Assembly Systems,
Loctite Leads The Industry
In Headlamp Bonding

LOCTITE





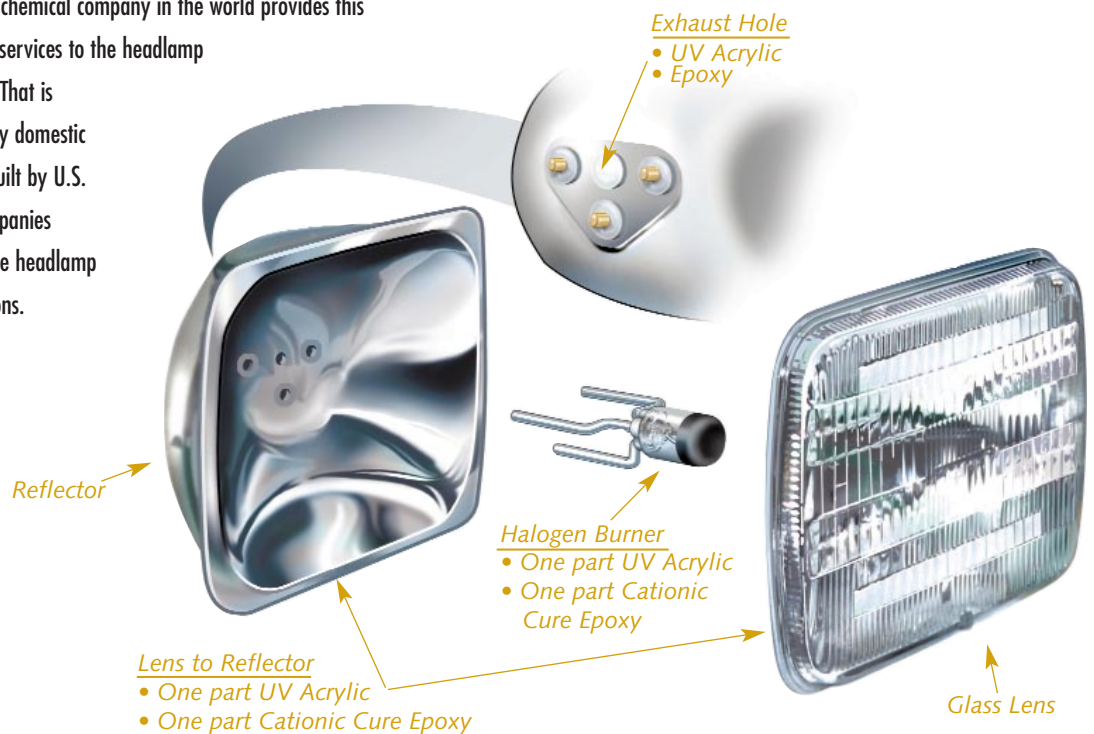
Design and Assembly Solutions

Headlamps are complex components that make a design statement in the modern automobile. Composed of versatile, high strength plastics and intricate electronic systems, they must withstand high operating temperatures, and harsh exterior environments.

To meet these requirements, headlamp manufacturers rely on Loctite® speciality materials and design and assembly processes for a full spectrum of solutions in bonding and sealing headlamp assemblies.

As the world leader in speciality materials for headlamps, Loctite collaborates with customers to formulate speciality adhesives, sealants, and potting compounds for virtually every headlamp component. These partnerships begin with component design, proceed through testing and validation, and culminate with custom-designed assembly systems that apply materials consistently and reliably.

No other chemical company in the world provides this range of services to the headlamp industry. That is why every domestic vehicle built by U.S. auto companies has Loctite headlamp applications.



Specific Materials For Specific Requirements

Most headlamps contain a wide range of Loctite® materials, each designed for a specific task in a demanding environment. These materials bond:

- Glass lenses to reflectors
- Seal exhaust holes
- Bond halogen burners
- Pot halogen insertion lamps

Loctite Technology Used In Headlamp Bonding Include:

- UV acrylics
- Two-part urethanes
- Hot melts
- UV room temperature-vulcanizing (RTV) silicones
- Anaerobics
- Cyanoacrylates
- Epoxies

Principle members of this versatile family of materials include:

Loctite® Nuva-Sil® the material of choice since 1986 for potting halogen headlamp sockets. Since that time, there have been more than 250 million applications of this one-part UV/RTV silicone in headlamp assemblies.

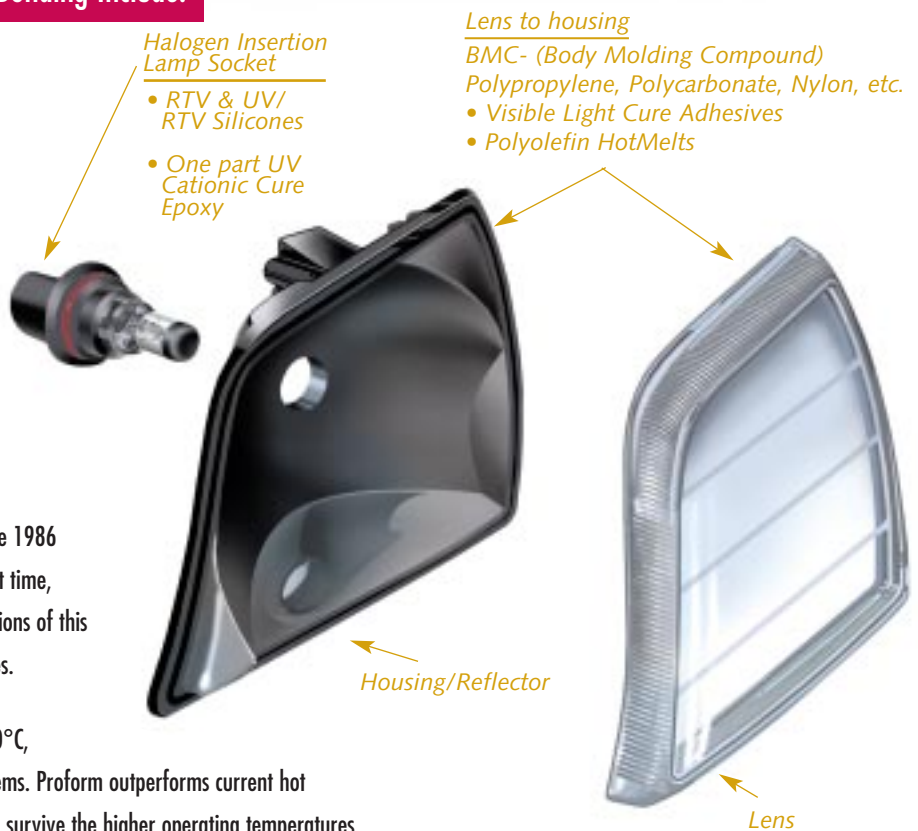
Proform™ Hot Melt Adhesives thrive at 120°C, providing a welcome solution to warranty problems. Proform outperforms current hot melts, which peak around 100°C, not enough to survive the higher operating temperatures generated by modern headlamps. One of the latest additions to the Loctite headlamp family of materials includes **Proform™ Polyolefin Hot Melt Adhesives**. These adhesives bond lenses to polypropylene plastic housings, and offer high operating process temperatures while affording sufficient open-time.

Loctite® UV Cationic Cure Epoxies, a one-component material with no outgassing, and temperature resistance up to 200°C, replace heat-cure epoxies in lens-to-reflector bonding. These materials simplify and reduce production costs, eliminating the need for large heat-curing ovens, freeing up valuable manufacturing space.

Loctite® Optically clear, UV room-temperature-cure epoxies rapidly pot LEDs in deep sections which allows for faster processing, and a minimized work-in-process.

Loctite® Visible Light Curing Acrylic Adhesives (VLA) deliver solutions for bonding polycarbonate lenses to plastic housings. Traditionally, two-component urethane adhesives, or silicone adhesives with mechanical clips were used, presenting problems in cure rates while creating excessive work in process.

Loctite VLA adhesives cure only when parts are mated and passed under a high-intensity curing lamp. The entire process takes only a minute, allowing pressure checks on-line, eliminating the need for curing ovens.



Worldwide Resources and Partnerships

To ensure a continuous stream of solutions for OEM and Tier I customers, Loctite operates a 200,000-square-foot research, development and engineering center at its North American headquarters in Rocky Hill, Connecticut. The largest RD&E operation in the world devoted to adhesives, sealants, and coatings. The center is QS-9000 certified, as are all Loctite facilities.

The new Loctite Automotive Technology Center, north of Detroit, operates advanced laboratories and sophisticated test equipment dedicated to developing and validating headlamp materials for the most demanding applications. In the 40,000-square-foot facility clearinghouse, Loctite collaborates with OEM and Tier I suppliers designing applications for future generations of cars, trucks, and off-road vehicles.

The Loctite Center For Expertise in Dublin, Ireland, develops materials for long-range automotive, industrial, electrical, and electronic applications.

The 200,000 square-foot manufacturing complex performs three separate processes: Chemical synthesis, precision formulation and packaging. Altogether, the plant produces 350 different products for Loctite. Products include Chipbonder® adhesives, pre-applied threadlockers, flange sealants, retaining compounds and porosity sealing resins.

For more information on Loctite Headlamp Bonding Systems and Materials, contact the Loctite Automotive Technology Center at (248) 828-8000, or visit us on the web: www.loctite.com; e-mail headlamps@loctite.com.



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• **Loctite Automotive Technology Center**
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• **Loctite Center For Expertise**
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For more information on Headlamp Adhesive Technology and the full line of Loctite® products, call the Loctite Automotive Technology Center at (248) 828-8000, or visit us on the web.

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