Proper innovation

Liquid Silicone Rubber - The Automotive Frontier

Introduction to LSR

Liquid silicone rubber (LSR) is a two component polymer that falls under the 'elastomer' family. This material has similar characteristics to that of rubber, but can be produced in a multitude of colors, including crystal clear. This elastomer has been used in medical and consumer products for decades including catheters, medical tubes, pacifiers, baby bottle nipples, and kitchen spatulas to name a few. The automotive industry is currently using this technology for under hood and electrical applications due to high thermal resistance. LSR can be over-molded to thermoplastic resins and chemical bond with polymers such as nylon to create structural components with a chemically resistant soft seal.

The automotive lighting industry is finding innovative ways to make use of this technology, and it starts with polymer chemistry.

Optical Grade LSR

New optical grade LSR materials are being produced to compete with polymers such as PC and PMMA (acrylic). Interesting enough, PC and PMMA replaced traditional materials such as glass due to processing cost advantages, reduced weight, and design flexibility. These materials are now facing some competition of their own with advancements in LSR chemistry that provide benefits in areas where PC and PMMA (thermoplastic polymers) are restricted. LED lighting technology is creating a demand for highly engineered materials that are resistant to high temperatures, UV light, and blue light radiation. Optical clarity is also an important factor in polymer selection for optical engineers. LED grade PC for example has an average optical clarity transmission percentage of 90% (at 2mm thick). While new grades of optical grade LSR are pushing the boundaries with transmission of 94% under the same testing methods. The image below is an example of an LSR lens. LSR suppliers are claiming this material can be molded as thick as 45mm.