Birefringence

Birefringence is common in many clear polymers. If you have ever looked through a pair of polarized sunglasses at a Pontiac windshield, you may have seen the purple haze caused by resin laminated between layers of glass. This optical property is defined by how light refracts through a material and is tied with the term 'polarization'. Essentially, a ray of light may travel at a faster speed thru one path of a material, and slower speeds through another path. How light passes through an object is referred to as refraction. This can be seen when we look at larger PC headlamps that appear to have a 'rainbow effect' under intense sunlight. This display of color is directly related to 'molded-in-stress' and molecular orientation. The PC lens in the image below shows a ray of purple stemming from high stress at the gate. Areas of lower stress appear more yellow. In the near future, automotive quality standards will not accept this condition in molded optical product.

LSR is molded with much lower pressures, exhibit a constant light transmission, and have an excellent refractive index for optical applications.

Injection Molding LSR

The process of injection molding LSR has some distinct differences to that of molding thermoplastic polymers. LSR cures through a chemical reaction, meaning that an A component and B component are mixed 1:1 to trigger the curing process. Curing is accelerated by heating of the injection mold. The injection molding equipment also has some distant differences. The image below shows a metering unit that conveys the A and B components to a mix head for injection into the mold. The mixing unit is cooled to stifle the chemical reaction. This equipment can be equip with stand injection barrels as well for use in two shot over-molding applications.

The Future of Lighting

Automotive OEM's are on the hunt for the next innovative technology. One of our primary lighting customers Hella, has already started the movement. Below is a rendered image of the next generation headlamp with LSR inner lens components, and the first to hit production in the automotive headlamp market space. The demand for this technology is moving at an incredible pace.

Proper Group is working diligently to stay 'ahead of the curve' to be a major player in this incredible technology. The future is at our fingertips. Challenge accepted!

Mike Tabbert
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