

CASE STUDY: SOUNDOFF SIGNAL

Emergency vehicle LED lighting gets more visible — and more rugged — with co-molded silicones from Dow



The challenge

One rainy night, a motorist calls 9-1-1 for help after getting into a “fender bender” accident with another vehicle. An unmarked police cruiser is the first to arrive on the scene at the dark intersection of two country roads. Suddenly, the plain-looking police vehicle lights up the night. Its previously “invisible” lights send bright warning lights far down the road to alert other motorists of the hazard ahead. The lighting also helps the officer see the accident scene and helps other motorists see the officer.

SoundOff Signal takes its job of manufacturing emergency vehicle lighting and warning electronics seriously. Already a global leader in this type of lighting, the company wanted to create a new, next-generation design to add to their popular lighting options for law enforcement, emergency and amber vehicles.

This employee-owned company in Hudsonville, Michigan, set out to create a new light with a smaller footprint, intense lighting, high quality and long life. The light would need the overall durability to withstand dirt, wet and extreme weather, gravel impacts and other road conditions. In addition to being rugged, the light’s materials must offer good photothermal stability to avoid yellowing from intense UV exposure.

SoundOff Signal turned to the team of LED lighting silicone experts at Dow for recommendations and support for their new design ideas.

The solution

SoundOff Signal created its first-generation optical design called ClearDuty technology. This technology and moldable silicone materials allow for the optic (lens) design and the housing to be molded — all in one piece. SoundOff Signal branded this new light as the mPOWER Fascia Light. It is the first extremely compact, tri-color line of lighting on the market.

When compared with a traditional polycarbonate lens, the new mPOWER Fascia Light has several advantages:

- A small footprint with maximized candela output
- Greater resistance to damage, such as gravel pitting, scratching or cracking
- Improved sealing performance to prevent water from entering the light
- Higher UV and photothermal stability to prevent lens yellowing over time

Smaller and lighter weight, the mPOWER Fascia Light can be mounted multiple ways and almost anywhere on a vehicle, including in grills and along tight areas on the sides of vehicles. The size, low profile and flat front make it easy to “disappear” and be unobtrusive.

The three- and four-inch lights have the ability to provide bright head-on and off-angle coverage with configurations of six to 18 LEDs — and up to three colors of LEDs from the same unit.



The success

For the mPOWER Fascia Light project, SoundOff Signal used silicones for the first time. The unique properties of the selected silicones, such as good elongation, enable this one-piece, combined lens and housing design. It features a three-part seal that stretches, “snaps” and protects the circuit board and back plate, making adhesives unnecessary. Fewer parts make assembly easier, too.

To make this mPOWER Fascia Light, the specially designed clear lens is molded from SILASTIC™ MS-1002 Moldable Silicone. This lens is then over-molded with SILASTIC™ MS-0002 Moldable Silicone to form the housing.

Both of these moldable silicones are very flexible, helping with assembly and later with durability — on the unforgiving road and in unrelenting weather conditions. SILASTIC™ MS-0002 Silicone is silica-filled and translucent, which helps with the coloring added.

SoundOff Signal successfully put Dow’s silicone materials and prototypes to the test before heading into production in early 2016.

“Working with Dow was an excellent experience,” said Weston Harness, lead mechanical engineer at SoundOff Signal. “From a design perspective, Dow was helpful in reviewing and then validating the design. They helped us by running the prototype parts in their validation lab. Given our close proximity, we had several onsite visits, and, of course, there were phone and email discussions. We were extremely impressed with Dow’s engagement with us on this project.”



mPOWER Fascia Light from SoundOff Signal is the first extremely compact, tri-color line of lighting on the market for emergency vehicles. The clear lens is molded with SILASTIC™ MS-1002 Moldable Silicone. Then the lens is over-molded with colored SILASTIC™ MS-0002 Moldable Silicone to seamlessly form the housing onto the lens.

About moldable silicones

SILASTIC™ moldable optical silicone elastomers are designed to meet the challenging needs of the optical market, including the need for high purity, good transmission, optical reflectivity, moisture resistance and photothermal stability.

These two-part, heat-cure silicone resins are especially suitable for precision molding applications because micrometer-sized features can be replicated on the lens surface to direct light output. Silicone optical molding materials can be molded into complex shapes, withstand heat better than plastic, resist yellowing better than plastic and are lighter than glass.

SILASTIC™ MS-1002 Moldable Silicone is a medium viscosity, fast curing, optical molding resin for producing fine detail. It has good transparency, good resistance to environmental aging and is UL 94 rated.

SILASTIC™ MS-0002 Moldable Silicone is a high viscosity, fast curing, liquid silicone rubber that has good translucency and good mechanical properties.

Learn more

We bring more than just an industry-leading portfolio of optics materials. As your dedicated innovation leader, we bring proven process and application expertise, a network of molding and optical experts, a reliable global supply base and world-class customer service.

To find out how Dow can support your lighting applications, visit consumer.dow.com/lighting.

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