

LSR for Added Value Industrial Applications

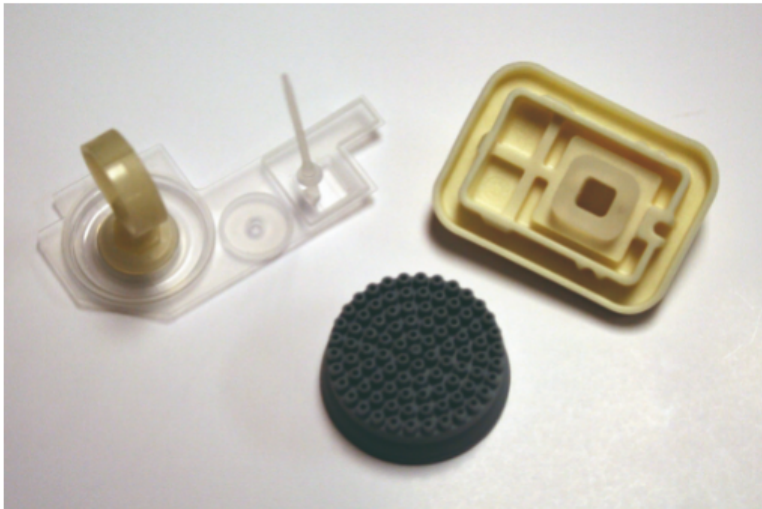
With global engineering and production facilities, state-of-the-art cleanrooms and advanced automated processes, Trelleborg Sealing Solutions already offers its medical device, biotech and pharmaceutical customers specialized custom molded solutions that enhance their product offerings.

However, a significant increase in demand for Liquid Silicone Rubber (LSR) components from key industrial OEMs and suppliers to the automotive industry has now been noted – especially for electronics, safety and driver comfort, where high volume production, full traceability and lack of manual handling are key benefits.



Automotive electronics need to be free of contamination to work effectively. Food and beverage products are also subject to FDA, 3-A and other standards

Complex LSR components for food and beverage equipment are also being produced as well as an expanding production of parts for high-end sanitary equipment, such as luxury rain and steam shower systems.



Liquid Silicone Rubber (LSR) components for various industrial applications

'Industrial' Cleanroom Requirements

Cleanroom facilities are not just for life sciences. Many customers from other industries also need parts produced or finished and packed in a clean environment.

Automotive electronics need to be free of any contamination to work effectively. Food and beverage products sometimes have similar regulations to life sciences, also being subject to FDA, 3-A and other standards.

LSR molding is also ideal for production of complex geometries and to consolidate assemblies combining numerous components into single parts – a process known as 'value engineering'.

Customers are increasingly requesting manufacturers to 'value engineer' their assemblies. Suppliers can offer tangible benefits to customers in terms of improved performance, prevention of contamination, the opportunity for automating their production lines, elimination of risk of misassembly, lower inventories and ultimately, lower overall costs.



Industrial end users increasingly turn to suppliers for micro-molded components

Two-Colored LSR Components

Trelleborg Sealing Solutions has now achieved a technical breakthrough in the injection of colored liquid silicone rubber components.

Utilizing an innovative proprietary tool construction, Trelleborg Sealing Solutions now has the capability to add color pigment to part of the silicone material stream just prior to its injection into the tool cavity. In this way, Trelleborg Sealing Solutions is able to produce two-colored liquid silicone rubber (LSR) components in a single shot, from a single tool.

The first application of this revolutionary technology is for a leading automotive tier-one supplier. The company was looking for a solution to visually differentiate geometrically identical parts that Trelleborg produces from a single tool for various vehicle platforms, without impacting the overall aesthetics of the finished product. This new process offers an ideal solution that is both practical and cost-effective.

The advantage of the two-colored LSR components to original equipment manufacturers is that it gives, without adding significant extra cost, product traceability. The tool design will allow an unlimited number of color combinations from a single machine, in a single tool and in one single shot.

2-Component Parts

In a proprietary co-injection process, a technical thermoplastic and a silicone are formed into a fully bonded high-precision composite, creating the 2-component part. This fully automated process makes Trelleborg Sealing Solutions a market leader in LSR 2-shot processing capabilities. If requested, 2-Component parts can be produced in state-of-the-art cleanrooms which offer completely flashless parts for use within safety critical applications – such as car airbag sensor covers.

Benefits of 2-Component part solutions include:

Greater design latitude
Feasibility of complex and micro components
Excellent sealing function of the composite
Elimination of the risk and costs associated with secondary assembly
Significantly reduced TCO (Total Cost of Ownership)

Flash-Free Molding

Trelleborg's LSR manufacturing facilities aim for flash-less and waste-less production. Using cold runner systems means that the injection material is not cured as the parts are molded in the tool. Virtually no runner is produced, so there is little overflow and due to the accuracy of the tooling, there is literally no flash.



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Closed Loop Automation

At Trelleborg Sealing Solutions, Liquid Silicone Rubber and Liquid Injection Molding processing is fully automated. This provides many advantages including:

A closed loop system ensures that no external impurities can be introduced through either the process or human contact
In-process quality control avoids extra control steps
Automation guarantees repeatability and reliability of process across millions of parts produced every year
Closed loop manufacturing set-ups in Class 7 and 8 cleanrooms guarantee the highest level of cleanliness

Precision Micro-Molding

Tiny precision tooling can produce big results in the life sciences industry and Trelleborg Sealing Solutions has the capability of producing miniature components through micro-molding. The smallest piece manufactured is a septum, the membrane in the cap of a medicine bottle through which one can insert and withdraw a syringe. This weighs just 0.003 grams and standard molding burrs are bigger than the object itself.

Manufacturing micro-components is achieved by:

Extreme accuracy in tool construction
Control of shot weight and the molding process
Automatic handling of the product after molding is done by unique, specially developed robot gripper arms
Accuracy maintained reliably for millions of shots

Key Benefits of LSR Component Manufacture

Pure – Silicone is one of the most extensively tested materials with a long history of safe use

Precise – Flashless, wasteless tool design concepts for parts from 0.002 grams to several hundred grams in weight

Reliable – Using latest technology in machinery, tooling and automation

Quality – '0' Defect Quality Level through in-process controls

Fast – Able to produce quantities from several thousand to millions

Clean – Utilizing state-of-the-art processing techniques and production in Class 7 and 8 cleanrooms

Cost Effectiveness – Lowest Total Cost of Ownership (TCO)

Trelleborg Sealing Solutions has decades of experience using injection molding technology with many proprietary and specialized elastomer materials. It is at the forefront of the latest developments and innovation in Liquid Silicone Rubber and two-component injection molding, as well as over-molding, pushing tool design and process engineering to new heights.

To discuss how Liquid Silicone Rubber components can enhance your industrial design process, contact your local Trelleborg Sealing Solutions Marketing Company.