

Molding One Part liquid silicone rubber

Molding of liquid silicone rubber (LSR) has been shown to be a very cost-effective method for making large quantities of small silicone rubber parts. LSR machine manufacturers, in conjunction with toolmakers and raw material suppliers, have developed systems that can run automatically with little operator support. But, while these systems are cost-effective for large production runs such as parts for consumer and automotive markets, they are not cost-effective for short runs of a few hundred or thousand parts. They are also difficult to adapt to running very large parts.

Laur designed a system that offered both low investment costs and ease of use. At the recent Rubber Division Mini Expo, Laur Silicone demonstrated a simple rubber molding system that was designed to overcome some of these problems. The system is comprised of half of a standard two-part LSR pumping system, a metering system and a Carver jack type lab press (figure 1). The pump was used to deliver a pre-programmed quantity of Laur One Part LSR with Easy Cure technology onto a heated mold. The system, as configured, was able to provide shot sizes that were within ± 2 grams for four different molds that were used during the show. The controller used on the system can be programmed to deliver nine different shot sizes for making nine different parts. It is possible to have molds with multiple cavities.

The One Part LSR that was featured during the show is Laur LS-7010-63 (Blue), which is a 61 durometer A LSR.

Table 1 and figure 2 show the actual physical properties and rheometer curve for this specific lot of material. This highlights a major advantage of the One Part LSR system. Because there is no mixing of part A and part B, the Certificate of Analysis represents the actual material that a customer will receive and process. There is little chance of off-ratio mixing or need to purge mixing lines during production interruption.

The proprietary cure system of LS-7010-63 offers several advantages over standard two-component LSR. While the One Part LSR pumps and processes like the normal two-part LSR, it has the distinct advantage of having a very long pot life, reduced risk of cure inhibition, and longer scorch time similar to the peroxide cured heat cure rubber. It can be processed in environments where other types of organic rubbers are being processed without fear of catalyst inhibition.

The One Part cure system does require slightly longer cure times than standard, two-part LSR, and is subject to cure inhibition if exposed to air during cure. However, these disadvantages are more than off-set by the advantages listed above.

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Figure 1 - rubber molding system

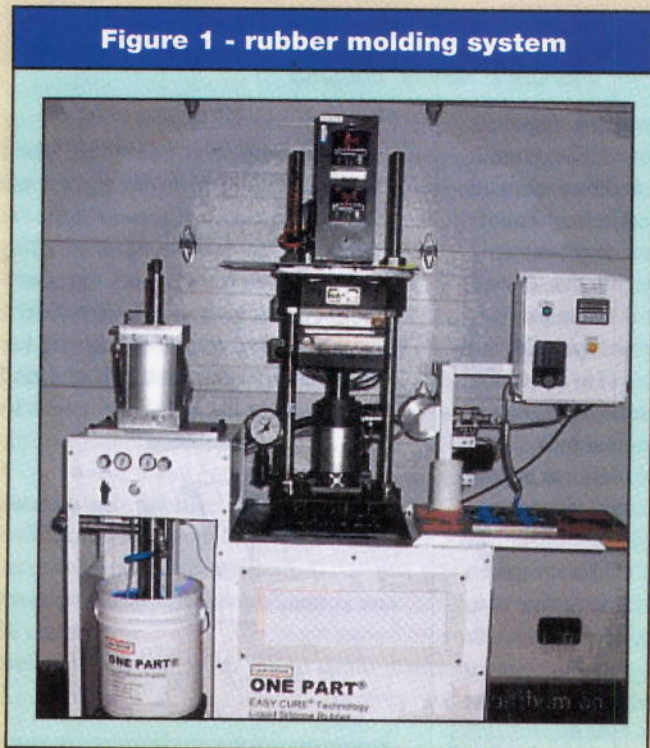


Table 1 - LS-7010-63 Blue

Property tested	Result
Hardness, durometer A	61
Tensile strength, MPa	7.3
Elongation, %	290
Tear, die B, kN/m	31
Specific gravity	1.14

Figure 2 - rheometer curve of LS-7010-63 (Blue) at 190°C

