Getting into Liquid Silicone Rubber? How to Choose the Right Mold Maker?

Rick Finnie, President
M.R. Mold & Engineering Corp.

Liquid silicone rubber has very distinct qualities. Designing and building molds for LSR cannot be compared to plastic injection molds. Choosing a mold maker who has experience with LSR is imperative. The mold maker you choose must have extensive design experience with LSR, modern equipment and technology. As most projects require creative problem solving, the mold maker must be able to meet this challenge. Having in-house equipment to test and sample the LSR mold prior to shipment is critical in saving you time and money. This paper will explain all that is necessary to find the right mold maker for your LSR project in order to maximize your production process.

1. A Reputable mold maker must have a number of years in business under their belt. Important factors a mold maker must possess are:
    a. Cooperation with the customer means understanding their needs, processes, specific requirements and equipment.
    b. Customer Service equates to brainstorming ideas, troubleshooting problems and on time delivery.
    c. The mold maker must take responsibility for their actions. If the mold maker has not done something correctly, either a design issue or dimensionally, they are obligated to make things right, at their expense. In all fairness to the mold maker, problems must be able to be verified with documentation or be a traceable issue.
    d. Timely communication in response to their questions/inquiries, quote turnaround and project updates.
    e. A mold manual should be provided with each mold. The mold manual is a comprehensive overview of the mold and includes mold design drawings, QC reports on critical dimensions and mold maintenance instructions.
2. Any mold maker building a silicone tool must understand the important differences between building a mold for plastic vs LSR
    a. Heated vs. cooled
    b. Runner and gates are much smaller
    c. Silicone is a thermoset material. Once its cured there is no regraining or reusing
    d. Venting is more challenging
    e. Vacuum is used
3. A desired mold maker MUST have a good amount of experience with LSR who as are familiar with the removal of silicone part, in addition to how silicone behaves and flows.

4. Design staff MUST have vast experience in designing molds for LSR. LSR molds require heat, insulation, vacuum and venting. Side action and ejection are definite design considerations for liquid silicone. The LSR designer has to know the ins and outs of silicone, understanding how it flows and cures. Plastic mold designers do not know this.
5. A mold shop needs highly trained staff that understands how to build a mold for LSR. The mold needs to mirror the design, holding close tolerances and critical dimensions. Verification of critical dimensions is standard procedure. As an example, we have a employee who comes in early to work undisturbed because his part of the mold build is critical.
6. A mold shop should have modern high-speed mills, EDMs, wire EDMs, surface grinders and inspection equipment. Solid modeling software and flow analysis software are an important part of an LSR mold build.
7. State of the art inspection equipment such as a video microscope, coordinate measuring machines are routinely used for cavity and core components qualifications. It is important that inspection equipment has capabilities of measuring up to .0001 because silicone flashes so easily. Video actual parts (?)
8. An innovative mold shop must stay informed on the latest technology, equipment, software and inspection equipment. The use of mold flow analysis is becoming an integral part of the mold building process.
10. The cold runner system for LSR is the counterpart to a hot runner in plastic. A cold runner system keeps the silicone cold until it is injected into a hot mold. The cold runner system for LSR eliminates the waste of runners and sprues which subsequently improves cycle times. It also makes automation easier.
11. The last and most important entity a LSR mold shop but have is the ability to test and sample a mold prior to shipment. Sampling the mold ensures the quality of the molded parts. A mold shop should have quality molding machines and auxiliary equipment, the knowledge of silicone properties and processing.