Ames Rubber Manufacturing
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Rubber Molding Guide

Which type of molding process is right for your application?

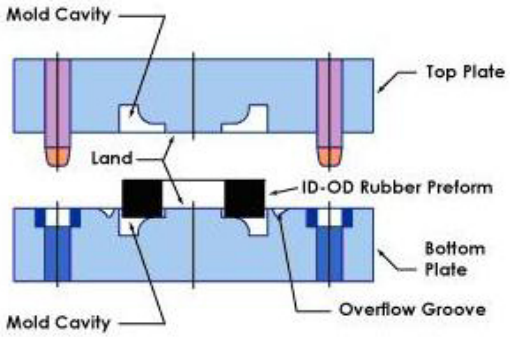
There are a number of factors to consider when determining the type of molding process required. Some of these include:

- The size and geometry of your part
- The weight of your part
- The Material required
- The volume of parts required

Whether your parts require commercial or precision tolerances, At **Ames Rubber Manufacturing**, We offer our customers cost effective molded rubber solutions.

Rubber Compression Molding

Compression Molding is the original production method for molding rubber. It is ideal for low to medium production volumes and is a particularly useful molding process for molding gaskets, seals, O-rings, and large, bulky parts. It is a widely used, efficient and economical production method for many products, particularly low production volumes of medium to large parts and higher cost materials.



Compression Mold - Open

Processes

Compression molding involves taking rubber compound or mixed raw material and making "pre-forms" that are close to the shape of the end product. These shapes are then loaded, typically by hand, into an open mold. The mold is closed, the rubber cured, and then de-molded.

Compression molding can be cost effective if one or more of the following is true:

- Compression molding tooling already exists
- The quantity required is low
- The cross-section of the part is very large and requires a long cure time
- It has a Rubber to Metal Bonding application
- Extreme material hardness is required
- Larger Parts required - Our Molding Platen sizes range from 12” x 12” to 45” x 45”

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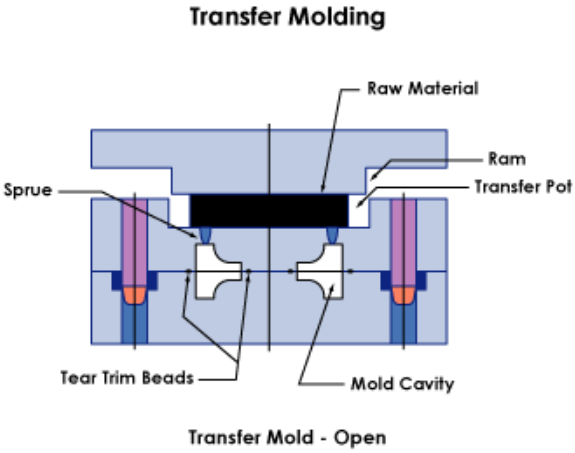
Rubber Transfer Molding

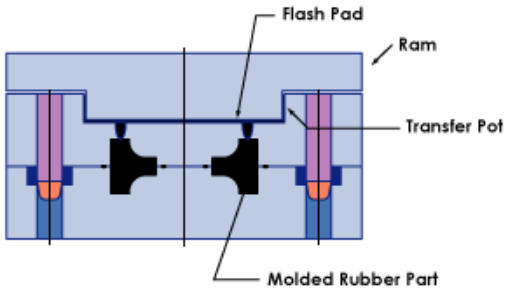
Transfer Molding combines the advantages of injection molding with the ease of compression molding. Rubber transfer molding is an ideal process for molding parts that require multiple cavities, intricate parts that require a closed mold, bonding rubber to metal parts and if the geometry of the part might cause mold cavities to trap air.



Transfer Mold - Open

Processes

Similar to compression molding, transfer molding requires secondary raw material preparation into "pre-forms" that are loaded into a "pot." When the mold is closed, a "piston" compresses the rubber in the "pot" and forces it through holes or sprues into the cavity to fill the part cavity.



Transfer Mold - Closed

The advantages of transfer molding over compression molding can include:

- Fewer and simpler pre-forms because one pre-form can fill many of cavities.
- Tighter dimensional tolerance control because the mold is closed, therefore it is not held open by excess material spilling out of the cavity parting line during molding. This keeps part geometry more exact and parting lines smaller and less noticeable.
- Colored rubber parts benefit because pre-forms can be cut by hand from raw material sheets, significantly reducing the chance of contamination that can come from mechanical prep for compression molding or the injection screw and barrel in injection molding.
- Material in the "pot" pre-heats before being forced into the cavities. This decreases the viscosity of the material, allowing it to flow more easily into the cavities for reduced cure time.

The primary disadvantage is increased waste; the "flash pad" or rubber left in the pot after transfer is typically cured and has to be discarded.

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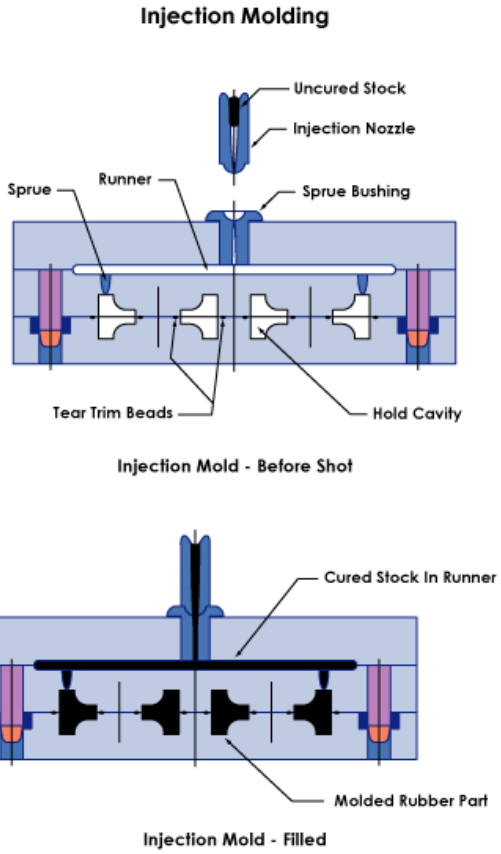
Injection Molding



Injection molding of rubber was originally an offshoot from the plastics industry in the early 1960s. After overcoming the initial issues of temperature, (plastics are cooled when molding and rubber is heated) and pressure (rubber injection molding requires significantly more pressure per square inch of cavity surface), the process has become an efficient way to mold rubber in many cases.

There are 3 main types of rubber injection molding:

Organic Rubber Injection

Organic rubber injection starts with more efficient material preparation. The material is mixed, and then stripped into continuous strips and fed into a screw which charges a barrel as needed with a pre-defined amount of material. When the mold is closed, the material in the barrel is injected into the mold cavities and cured. Benefits of injection molding include:

- Complete elimination of operator placement of pre-forms
- The injection screw pre-heats the material before forcing it into the cavities. This decreases the viscosity of the material, allowing it to flow more easily into the cavities.
- Moderately quicker cycle times than compression and transfer molding

Liquid Injection Molding (LIM) or (LSR) Injection

is the process where a two part liquid silicone compound (A & B parts) are delivered at a fixed ratio into a static mixer. The LSR mixture blends with a platinum cure system and is delivered into the injection unit where it is injected through a runner and gate system into the closed mold until cured. At the end of the cycle the parts are removed or ejected from the cavities and the next cycle begins. Benefits of LIM molding include:

- Automated closed-loop systems limit contamination
- Nearly “flash-less” parts
- Optimized cycle times
- LIM is well suited to the unique needs of the medical product industry

- LIM materials are biocompatible, inert and stable, flexible, have a low compression set with a wide range of Durometers, and offer superior heat resistance.
- High quality components with complex shapes can be repeated in high quantities in a cost effective manner.

Thermoplastic Rubber (TPR) Injection utilizes thermoplastic elastomers (TPE) that have the properties and performance of rubber, but are processed like plastic. Benefits of choosing TPE over thermoset rubber can include:

- Simplified processing — no mixing or vulcanization involved
- Lower part costs through lower density and thinner wall sections
- TPEs are colorable
- Recyclable scraps and part

Remember — the very thing that allows TPEs to be processed as thermoplastics will also restrict the use of these materials in high temperature applications.