

1. What is rubber compression molding?

It is the manufacturing process of rubber parts and products that involves molding rubber materials by placing rubber into a heated mold and compressing it. At the same time, the mold contains two halves that can be opened to place the rubber and compressed to ensure the flow inside the mold. Both halves of the die (top and bottom) are connected to a compression mechanism (hydraulic, mechanical or any other type).

However, things are not as simple as they seem. Compression forces, mold temperatures, and even the weight of the rubber material all need to be precise to complete the process.

Temperature control is essential to ensure that the rubber placed inside the mold is activated and flowing, and compression allows the melted rubber to take shape. In addition, you might think that the material is splattered from the position where the two half molds meet. You are right, which is why placing the exact weight on the mold can only minimize material waste.

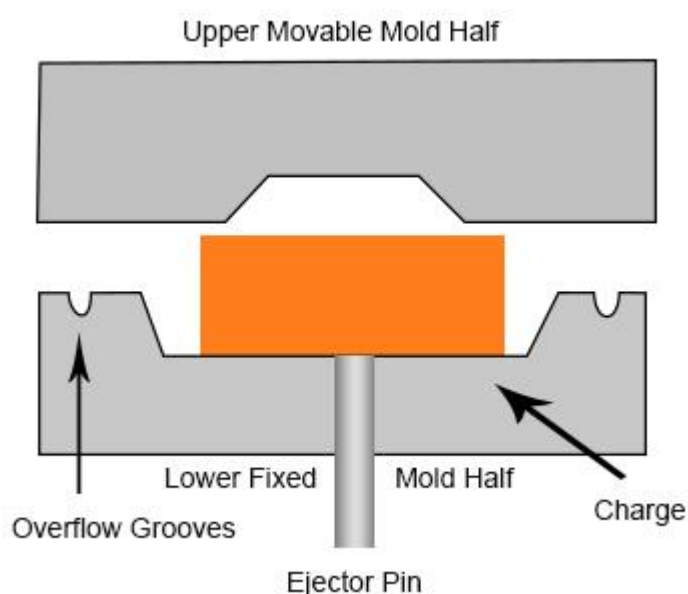
2. What type of rubber can be molded?

Now, what type of rubber material is compatible with compression molding? The basic requirement is that rubber properties should support the flow of rubber in the mold during processing.

You can utilize a variety of rubber types in compression molding depending on which rubber best suits your application requirements. Common natural rubber, nitrile rubber, silicone rubber, butyl rubber and so on. However, silicone molding is the most popular due to its flexibility and a range of properties.

3. Rubber compression molding process

The rubber material forming process requires precise control of temperature and pressure. In addition, the correct tool setup and curing are equally important.



Let's break down the process of rubber compression molding into separate steps. Well, then, it's easy to understand.

1). Mold making

The first step is to design and manufacture the compression molding mold. The design contains all the information such as dimensions, tolerances and other specifications. At the same time, EDM or CNC machining prepares mold according to design.

2). Machines and tooling

Machine setup includes laying out the mold in the machine and setting up the appropriate compression system for the mold. The clamping plate can be provided with a hydraulic system, and the clamping plate is connected with the lower half, which can be opened and closed as required.

3). Put the rubber into the mold

Next, place the appropriate size of rubber into the open mold, which can be done manually or automatically. Here, the mold and rubber are preheated. Another thing is that the material should be weighed before it is put into the mold.

4). Compression and curing

Mold temperature is maintained between 140°C and 200°C. During the game. The compressive force depends on different factors;

Next, the curing time is 3-5 minutes, and after pressure is applied to the heated rubber, the material flows into the cavity to fill in the details.

5). Parts ejection and post-processing

Once the rubber part has solidified in the compression mold. Ejector mechanism opens half die. Advanced machines consist of automatic ejecting, while traditional compression molding requires manual and careful ejecting of parts.

The flash and excess material at the junction of the half die are then removed by machining or other processes. Therefore, further processing (such as polishing) helps to achieve the desired aesthetic requirements.

4. Advantages of rubber compression molding

First, rubber parts or products made by compression molding show good strength, durability and cost advantages. Secondly, it is also suitable for a variety of batches, from small batches to large batches. In fact, the cost per part is reduced for each subsequent batch.

Large size parts

First, compression molding can make large size and weight rubber parts while keeping the original properties unchanged. It can also make thicker parts than injection molding.

Simple tool

The tool is also simple and cost-effective. The reason is simple and cheaper mold making and other tool arrangements. At the same time, the compression molding machine is not too complicated.

Minimum material waste

The correct weight of raw materials significantly reduces material waste, which also helps to reduce overall costs. On a small run, it may seem insignificant, but you can see the impact on a large run.

Suitable for rubber prototypes

Rubber compression molding offers cost advantages in product development for a wide range of rubber components. At the same time, it provides the required precision.

5. Disadvantages of rubber compression molding

There are some limitations to this approach. The disadvantages of common rubber compression molding are the complexity of the parts and the content containing complex features such as long corners, short corners or bottom cuts.

Another disadvantage is its cycle time. Compression and curing help extend production time.

In addition, spillage or excess rubber at the parting line requires further treatment to remove excess material.

***Limited complex features**

***The production speed is slow**

***Post-processing is required in many cases**

6. Is there an alternative to rubber compression molding?

Yes, we do! There are two other popular rubber material molding methods: rubber injection molding and custom extrusion. Each of these processes has its own advantages in specific scenarios.

1). Rubber injection molding

The process involves injecting a mixture of molten rubber polymers, additives, catalysts and pigments into an injection mold under high pressure.

Fast cycle time

The finish of molded rubber parts

The ability to complex features and shapes

High cost efficiency in mass production

If you need complex rubber parts, injection molding may be a better choice. In addition, it is also suitable for liquid silicone rubber molding.

2). Custom extrusion

Next, the extrusion method works by pressing the rubber material into the extrusion mold to form it. It can create custom shapes (mostly linear) and can also extrude multiple types of rubber to produce a single item. Therefore, it is very popular in different applications. For example, custom silicone extrusion plays an important role in medical pipes.

7. Molded rubber parts play an important role in sealing parts of different equipment or systems. They are also used for vibration reduction. The reason behind countless applications is the flexibility and durability of rubber materials.

The following are common applications of rubber compression molding;

- *Rubber gaskets and seals**
- *Rubber bushing**
- *O-ring**
- *diaphragm**
- *Anti-vibration support**
- *Bumper and shock absorbers**
- *Electronic keyboard**
- *Handle and grip**
- *Electrical insulator**
- *Rubber roll**
- *Foot pad**
- *Battery seal**
- *Medical equipment component**

