Compression Molding

The oldest and simplest method of processing thermoset-molding materials is Compression Molding. The mold consists of a cavity side, with one or more cavities and a force side.

The mold is heated by either electric cartridge heaters, steam, or oil.

Typical temperature ranges are:

- 330°F - 360°F (165°C - 182°C) for PLENCO phenolic molding compounds
- 300°F - 350°F (150°C - 177°C) for PLENCO melamine-phenolic molding compounds
- 310°F - 350°F (154°C - 177°C) for PLENCO granular polyester molding compounds
- 290°F - 340°F (143°C - 171°C) for PLENCO BMC polyester molding compounds

The phenolic or melamine-phenolic materials may be in the form of loose unheated granules called **cold powder**, or compacted into tablets/pills called **preforms.** They can be used cold but normally are heated to a state of flux. Another method is to use a screw preplasticizer to **extrude a preheated slug** that is handled just like a heated preform. PLENCO granular thermoset polyester material be processed using a screw preplasticizer. When it is used in the form of cold powder or preheated preforms, there is a strong tendency to obtain a poor surface appearance. BMC materials are used in the form of logs or bulk and while they can be preheated, generally they are molded cold. Once the material is loaded into the cavity or cavities, the mold is closed using the clamping force dictated by the size and number of the parts being molded. The mold is held closed long enough to cure the parts. Generally, this means the parts are held in the mold until they can be removed without blistering subsequent to removal. The **length of cure** is primarily determined by the thickest cross-section in the part, the temperature of the material loaded into the cavity and the temperature of the mold.

Advantages of Compression Molding

- Typically, the shrinkages are less in compression molding. Stiffer flow materials are used and they do not shrink as much as softer flow materials. Because of lower shrinkages, warpage is lessened and dimensional accuracy is improved over transfer and injection molded parts.
- Mold costs tend to be lower because the molds are typically less complex.
- Low volume jobs are better suited to compression molding because start up is usually quicker, easier and generates less scrap.

Advantages of Compression Molding continued

- Cycle times for compression molded parts using preheated preforms can be less than for injection-molded parts.
- Round parts usually have better concentricity than injection molded parts and may have better properties.

Disadvantages of Compression Molding

- Compression molded parts usually are more labor intensive. Preforms must be made, heated and loaded into the mold by an operator or a robot.
- Cold Powder Compression Molding can reduce the labor costs to equal those of automatic injection molding, however cycle times will be longer than parts molded with preheated preforms or injection molded. The surface finish may not be as good, and parts may not have the same properties as with preheated preforms.
- Parting line flash may be heavier and more difficult to remove. Removal of the heavier flash may yield chipping of the parting line.

Printed: April 28, 2026
Revised: April 28, 2026
Supersedes: October 6, 2015