



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 to a temperature range of 330°F - 360°F (165°C - 182°C) for phenolic molding compounds, 300°F – 350°F (150°C - 177°C) for melamine-phenolic molding compounds, 325°F - 360°F (163°C - 182°C) for PLENCO granular polyester molding compounds or 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 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** which 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.

What are the 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. As a result of lower shrinkages, warpage is lessened and dimensional accuracy, other than across parting lines, is better.
- Mold costs tend to be lower because the molds are less complex.
- Low volume jobs are better suited to compression molding because start up is usually quicker, easier and generates less scrap.
- 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.

What are the 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 harder to remove and chipping can occur as a result of its removal.
- Across parting line dimensions can be more difficult to control.
- It can be more difficult to mold metal inserts into the parts without flashing them.
- Cored holes should not have a depth greater than 2½ times the diameter.

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This information is suggested as a guide to those interested in processing Plenco Thermoset molding materials. The information presented is for your evaluation and may or may not be compatible for all mold designs, press configurations, and material rheology. Please feel free to call Plenco with any questions about PLENCO molding materials or processing and a Technical Service Representative will assist you.