



Classifications of Molds for Thermoplastic and Thermoset Materials:

A Guide for the Purchaser or Manufacturer of Molds

Customary business practices of the moldmaking industry when specifying or purchasing a mold; classifications for different types of molds (and their approximate lifespans) to minimize confusion when quoting or placing an order for a mold

General Notes by the [Plastics Industry Association](#):

The following classifications are guidelines to be used in obtaining quotations and placing order for uniform types of molds. It is our desire through these classifications to help eliminate confusion in the mold quote system and increase customer satisfaction.

It is strongly recommended that mold drawings be obtained before construction is started on any injection mold. Even though parts may seem simple enough not to warrant a mold design, a drawing shows sizes and steel types will pay for itself in the event of mold damage.

As the applications of plastics become more sophisticated, so must mold designs.

When designing a mold for a difficult part there are resources available to the moldmaker and molder to confirm the best mold design. For these designs, it is recommended that a computer aided flow and or/cooling analysis be performed.

These programs may help determine the best mold design, saving time and cost of design work.

These classifications are for mold specifications only and in no way guarantee workmanship. It is very important that purchasers deal with vendors whose workmanship standards and reliability are well proven.

Mold life, because of variations in part design and molding conditions, cannot be guaranteed. This guide will attempt to give approximate cycles for each type of mold excluding wear caused by material abrasion, poor mold maintenance and improper technique.

Normal maintenance such as replacement of broken springs, broken ejector pins, worn rings, or the rework of nicks and scratches should be borne by the molder. Mold rework costs should be closely considered when deciding which classification of mold is required.

This document does not constitute a warranty or guarantee by the Plastics Industry Association, or its members for the classifications or specifications set forth herein.

The following pages contains a brief synopsis of the various mold classifications and the detailed descriptions of each mold class up to 400 Tons.

Class 101 Mold

- Cycles: 1 Million or more
- Built for extremely high production, this is the highest priced mold and is made with only the highest quality materials.
- Detailed mold design required.
- Mold base to be minimum hardness of 280BHN.
- Molding surfaces (cavities and cores) must be hardened to a minimum of 48 R/C range. All other details should also be hardened tool steels.
- Steels moving against one another should be dissimilar and have a hardness differential of at least 4 Rockwell "C".
- Ejection should be guided.
- Slides must have wear plates.
- Temperature control provisions to be in cavities, cores and slides wherever possible.
- It is recommended that plates and inserts containing cooling channels be of a corrosive resistant material or treated to prevent corrosion. Corrosion in the cooling channels decreases cooling efficiency thus degrading part quality and increasing cycle time.

Class 102 Mold

- Cycles: Not exceeding one million
 - Built for medium to high production, good for abrasive materials and/or parts requiring cost tolerances. This is a high quality, fairly-high quality, fairly-high priced mold.
 - Detailed mold design is required.
 - Mold base to be minimum hardness of 280BHN.
 - Molding surfaces (cavities and cores) must be hardened to minimum of 48 R/C range. All other details should be made and heat treated.
 - Temperature control provisions to be directly in the cavities, cores and slides wherever possible.
 - Parting line blocks are recommended for all molds.
 - The following may or may not be required depending on the production quantities anticipated. It is recommended that the production quantities be made a firm requirement for quoting purposes.
- Guided Ejection, Slide Wear Plastics, Corrosive Resistant Temperature Control Channels, Plated Cavities

Class 103 Mold

- Cycles: Under 500,000
- Built for medium production. This is a very popular mold for low to medium production needs. Most common price range.
- Detailed mold design recommended.
- Mold base must be minimum hardness of 165BHN.
- Cavity and cores must be 280BHN or higher.
- All other extras are optional.

Class 104 Mold

- Cycles: Under 100,000
- Built for low production. Used only for limited production preferably with nonabrasive materials. Low to moderate price range.
- Mold design recommended.
- Mold base can be of mild steel or aluminum.
- Cavities can be of aluminum, mild steel or any other agreed upon metal.
- All other extras are optional.

Class 105 Mold

- Cycles: Not exceeding 500
- Built for prototype mold only. This mold will be constructed in the least expensive manner possible to produce a very limited quantity of prototypes.
- May be constructed from cast material or epoxy or any other material offering sufficient strength to produce minimum prototype pieces.