



Mold Standards & Classifications

Molders and Mold makers can build a mold in a wide variety of ways - ranging from the quick & economical prototype mold to the super high quality, long lasting production mold. The issue is to ensure that when a mold is quoted everyone involved is "on the same page". For this purpose Tetra Mold & Tool has listed our "Standard" mold specifications below. This is the way we quote our standard production mold. In addition to our own specifications, we have also listed below the industry standard "Mold Classifications" prepared by the Mold Makers Division of the **Society of the Plastics Industry, Inc.**

TETRA MOLD & TOOL: STANDARD MOLD BUILD

- Detailed Mold designs featuring a full Bill of Materials, Assembly drawings, and Detail drawings
- A-Series DME Standard Mold Bases, #2 Steel (28-30R/C).
- Cavity & Core Machined in P-20 Steel Inserts (30-32 R/C) [*However, about 50% of the molds we build utilize hardened H-13, S-7, or 420SS (48-58 R/C). We try to recommend core & cavity materials based upon what we know about the project - part material, production amounts, life of the program, cycle requirements, expected maintenance, etc.*].
- SPI #3 Cavity Finish.
- Water/Cooling lines in Cores and Cavities (*and in sub-inserts & slide bodies if feasible*) with Jiffy-Plug connectors.
- Guided Ejection system with Spring Loaded Return & Tapped Knock-out holes
- All Slides have: Lamina Wear Plates, Hardened Gibs, Hardened Heel Blocks, and Slide Retainers
- Lifters typically have a Core and a separate lifting rods, Lifter guide bushings, and replaceable gib/couplings.
- Tunnel (sub) gate, if possible (Edge/Chisel gate if Tunnel gate is not feasible).
- Eyebolt holes in 4 sides of mold each half.
- All Parting lines are either ground or hand blue fit (NOT swaged down with fit press tonnage).
- All Vents are machine cut or machine ground (NOT done by hand grinding).
- Hot Runner Systems are typically built in-house with Standard DME components OR purchased from a recommended hot runner supplier.
- Mold is stamped with Customer Name, Part Name, Part Number, Approximate Weight, and Manufacture Date. Inserts and Details are stamped with Material type and Detail Number. "0" corner is stamped in all mold plates.
- If Plating is needed for wear resistance, corrosion resistance, or lubricity/release we typically use Armoloy pure *chromium plating*).
- We are careful NOT to use like-steels on details that wear against each other and typically observe the rule of having 10 points R/C hardness difference as well as using good shutoff angles.
- We are mindful of vulnerable shapes and high wear areas and we try to sub-insert these portions when feasible.
- Also, we try to recommend Parting Line Locks, Switches, Early Ejector Return Systems, Accelerated Ejectors, as well as other components and peripherals when we believe they are necessary.
- Our average build would probably be considered a Class 102. Although we specialize in Class 101, 102, & 103 molds we do still build class 104 & 105 class pre-production molds and prototype molds upon request.

The Society of The Plastics Industry: MOLD CLASSIFICATIONS

INTRODUCTION

The following classifications are guidelines to be used in obtaining quotations and placing orders 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 showing sizes and steel types will pay for itself in event of mold damage. 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 mold 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 molding technique. Maintenance is not the responsibility of the mold maker. 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 Society of the Plastics Industry, Inc., or its members for the classifications or specifications set forth herein.

CLASSIFICATION OF INJECTION MOLDS UP TO 400 TONS

The following contains a brief synopsis of the various mold classifications and the detailed descriptions of each mold class. Again, it is our recommendation that a **MOLD DATA SHEET** (an example of which is in the back of the SPI manual) be included with each request for quotation.

GENERAL SPECIFICATIONS

1. Customer to approve mold design prior to start of construction.
2. All molds, with the exception of prototype, to have adequate channels for temperature control.
3. Wherever feasible, all details should be marked with steel type and Rockwell hardness approximately .005 deep.
4. Customer name, part number, and mold number should be steel stamped on mold.
5. All molds should have eyebolt holes on the top side. There should be one above and one below the parting line to facilitate mold removal, if required, in halves.

CLASS 101 MOLDS

Cycles: One million or more

Description: 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 28 R/C.
- Molding surfaces (cavities and cores) must be hardened to a minimum of 48 R/C range. All other details, such as sub-inserts, slides, heel blocks, gibs, wedge blocks, lifters, etc. should also be of hardened tool steels.
- Ejection should be guided.
- Slides must have wear plates.
- Temperature control provisions to be in cavities, cores and slide cores wherever possible.
- Over the life of a mold, corrosion in the cooling channels decreases cooling efficiency thus degrading part quality and increasing cycle time. It is therefore recommended that plates or inserts containing cooling channels be of a corrosive resistant material or treated to prevent corrosion.

- Parting line locks are required on all molds.

CLASS 102 MOLDS

Cycles: Not exceeding one million

Description: Medium to high production mold, good for abrasive materials and/or parts requiring close tolerances. This is a high quality, fairly high priced mold.

- Detailed mold design required.
- Mold base to be minimum hardness of 28 R/C.
- Molding surfaces should be hardened to a 48 R/C range. All other functional details should be made and heat treated.
- Temperature control provisions to be directly in the cavities, cores, and slide cores wherever possible.
- Parting line locks are recommended for all molds.
- The following items may or may not be required depending on the ultimate production quantities anticipated. It is recommended that those items desired be made a firm requirement for quoting purposes:
 - a. Guided Ejection
 - b. Slide Wear Plates
 - c. Corrosive Resistant Temperature Control Channels
 - d. Plated Cavities

CLASS 103 MOLDS

*Cycles: Under 500,000

Description: Medium production mold. This is a very popular mold for low to medium production needs. Average price range molds.

- Detailed mold design recommended.
- Mold base must be minimum hardness of 8 R/C.
- Cavity and cores must be 28 R/C or higher.
- All other extras are optional.

CLASS 104 MOLDS

*Cycles: Under 100,000

Description: Low production mold. Used only for limited production preferably with non-abrasive materials. Low to moderate price range molds.

- 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.

CLASS 105 MOLDS

Cycles: Not exceeding 500

Description: Prototype only. This mold will be constructed in the least expensive manner possible to produce a very limited quantity of prototype parts.

- These Molds may be constructed from any material including cast metal or epoxy or any other material offering sufficient strength to produce the minimum number of prototype pieces.