

A Typical Injection Mold Design Guide

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This checklist can be used as a general reference guide for injection mold design engineers. It is divided into 3 parts of a mold design process.

Part 1 - Requirements to start your mold design:

1. Check the injection machine where the mold is to be mounted. This will help you decide the size and structure of the mold for ease of installation and other factors. Important notes:
 - Locating ring size (or other positioning method)
 - Nozzle size
 - Method of clamping (Auto or manual)
 - Temperature control system
2. Determine the number of cavities and volume requirements. This will help you decide the material that you are going to use and other mold components that you will choose for cost effective design.
3. Determine the gate location and size.
4. Determine the location where ejector pin marks are prohibited.

Part 2 - Mold base layout:

1. Place cavities close to the center of the mold to minimize base size and runner length.
2. Ensure that the molded part remains on the movable half (ejector half) upon opening of PL to facilitate proper ejection.
3. Waterlines should be placed as evenly as possible to the contours of the cavity.
4. Use support pillars underneath the cavity pockets.
5. Use ejector guides for molds with small ejector pins and rectangular ejector pins.
6. Provide eye-bolt hole for ease of mounting and dismounting.
7. Install mold opening prevention locks on the operator side.
8. Establish pry bar groove on the corners of the mold parting line to facilitate ease of mold opening.

By this time you may ask for the mold layout approval from the customer.

Part 3 - Cavity/core details:

1. Check material shrinkage. Locate portions (corners) for possible significant deflection and deformation.
2. Maintain uniform wall thickness.
3. Draft angle should be within dimension tolerance.
4. Divide core blocks to simplify machining and provide gas vent path.
5. Gate, small cores, and cores with shut-off fittings are better designed as insertable components for easy modification and repair.
6. Watch out for possible deformation of core pins.
7. Position the ejector pins on the ribs and other high strength locations. Ensure ejector balance.
8. Detailing/part drawing: Include all parameters needed for processing -material, quantity, surface finish/texture, dimensions, tolerances and many more. Do not assume the machinist understands everything.

Once you sought approval for the design any design changes or amendment shall be confirmed.

Few extras that could make your mold one step further in terms of quality:

1. Bevel edges. Whenever possible use machine to bevel the edges.
2. Minimize scratches on the mold base. Keep the work table clean.

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