

Injection Molding Introduction

Part 2: Injection Molding Curriculum

Injection Molding

- Injection Molding What IS IT?
- Injection Molding History
- Injection Molding Design
- Injection Molding Process

What Is Injection Molding

- ✓ **Injection molding** is a manufacturing process for producing parts by injecting material into a mold. Injection molding can be performed with a host of materials mainly including metals, glasses, elastomers, confections, and most commonly thermoplastic and thermoset polymers. Material for the part is fed into a heated barrel, mixed, and forced into a mold cavity, where it cools and hardens to the configuration of the cavity.

Applications Of Injection Molding

- ✓ Injection molding is used to create many things such as Cups, Containers, tools, Mechanical parts (Including gears).
- ✓ Injection molding is the most common modern method of manufacturing parts. It is ideal for producing high volumes of the same object.

Plastic Classification

Thermoplastic

- ✓ Thermoplastics are resins that can be reground after molding, and molded again.
- ✓ Thermoplastic are often compared to Wax.

Thermoset

- ✓ Thermosets can be molded once only; they tend to be denser materials for special purposes , thermosets are often compared to an egg; once the egg is hard boiled it can't be returned to a liquid and recooked as sunny side up.

Most Commonly Used Materials

- ✓ PVC
- ✓ ABS(Acrylonitrile Butadiene Styrene)
- ✓ Polypropylene
- ✓ Polystyrene
- ✓ HDPE(High density poly ethylene)
- ✓ LDPE(Low density poly ethylene)
- ✓ Rubber Thermoplastic
- ✓ Epoxy

Injection molding Used For ?

- ✓ *Plastic Injection molding*
- ✓ *Rubber injection molding*
- ✓ *Metal Injection molding*

Injection molding Used For Plastic Injection Molding



Injection molding Used For Rubber Injection Molding

- ✓ Injection molds can make many rubber components.
- ✓ It makes valve steam seals, oil seals for engines, telecommunication items etc.



Injection molding Used For Metal injection Molding

Injection molds can stamp out small to large items. It can stamp out automobile parts from spark plugs and floor pans to ball bearings. It also can stamp out items like TV hangers and knitting needles.



Plastic Injection Molding Applications

- ✓ Writing instruments components (pen barrel, cap, bush etc)
- ✓ Computer Electronics
- ✓ Automotive Components
- ✓ Aerospace Components
- ✓ Electronic Components
- ✓ Toys etc.

Advantages Of Injection Molding

- ✓ Fast production.
- ✓ Low labour costs.
- ✓ Design flexibility.
- ✓ High-output production.
- ✓ Multiple materials can be used at the same time.
- ✓ Can be used to produce very small parts.
- ✓ Leaves little post-production scrap.
- ✓ Ability to include inserts.
- ✓ Good colour control.
- ✓ Good product consistency.
- ✓ Reduced requirements for finishing.
- ✓ Good dimensional control.

Disadvantages Of Injection Molding

- ✓ High initial tooling and machinery cost.
- ✓ Part design restrictions.
- ✓ Small runs of parts can be costly