

Injection Moulding

Introduction

Injection moulding is a widely used process in manufacturing. It is a quick way of producing large numbers of identical components such as plastic trays and safety helmets.

Most thermoplastics can be injection moulded, including,

- Nylon (PA)
- Polycarbonate (PC)
- Polypropylene (PP)
- Polystyrene (GPPS)
- Acrylonitrile-Butadiene-Styrene (ABS).

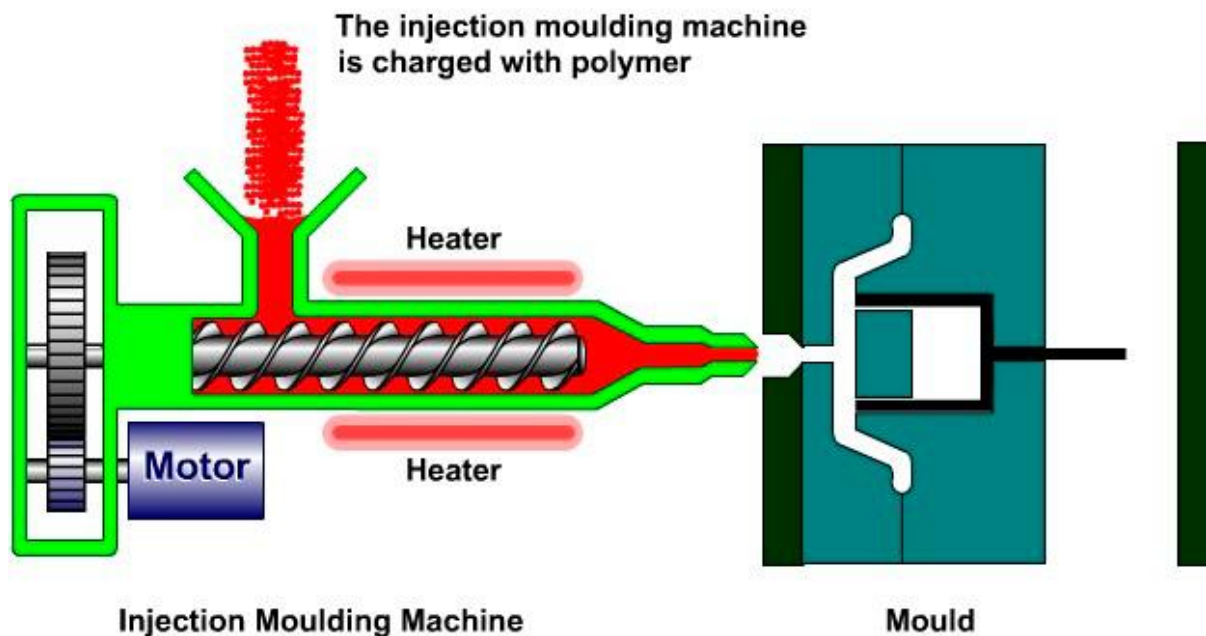
The injection moulding process

Polymer pellets are fed into the hopper of the injection moulding machine. The pellets pass to the heated barrel of the injection moulding machine where they melt. The feed screw rams the molten polymer into the mould under great pressure.

After the plastic component in the mould has cooled and solidified sufficiently, the mould is opened and the component is ejected.

Step 1

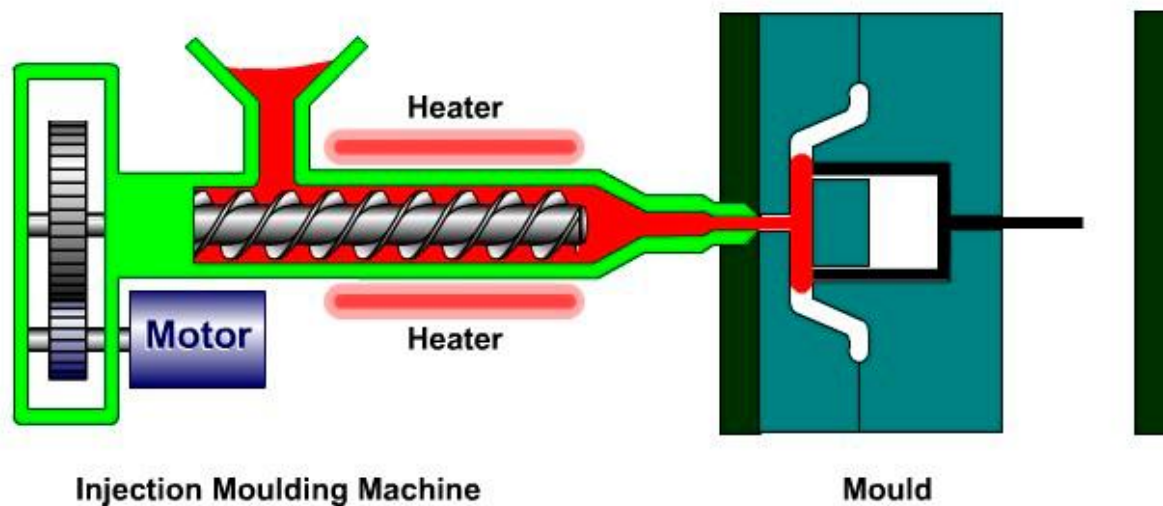
Polymer pellets are fed into the hopper of the injection moulding machine.



Step 2

The pellets pass to the heated barrel of the injection moulding machine where they melt. The feed screw rams the molten polymer into the mould under great pressure.

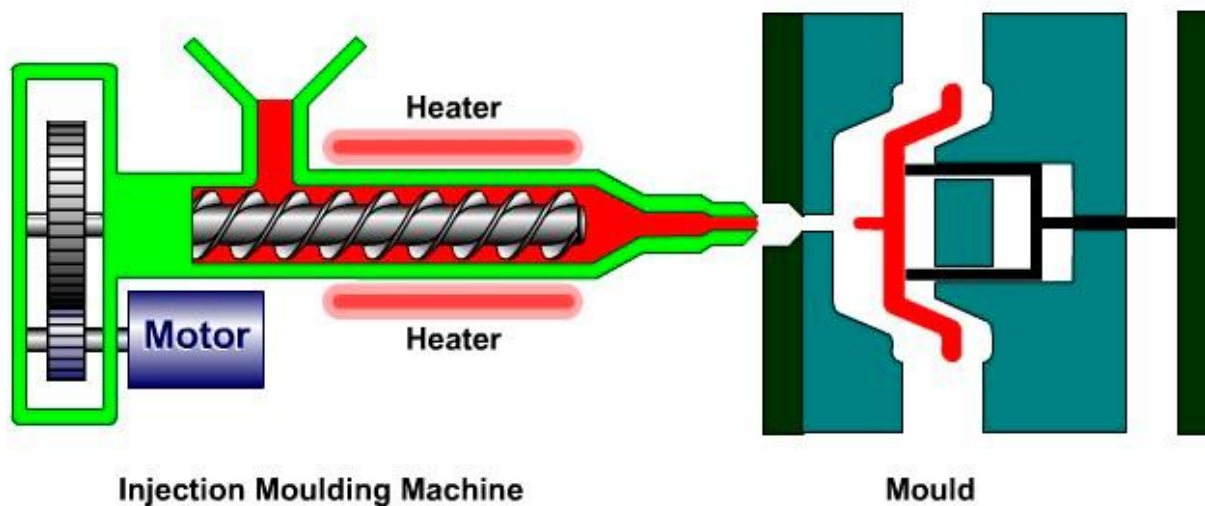
The mould is filled under great pressure



Step 3

When the plastic component in the mould has cooled and solidified sufficiently, the mould is opened and the component is ejected.

The mould opens and ejects the moulding



Injection Blow Moulding

Injection blow moulding is a process used to make hollow products, such as drinks bottles, in large quantities.

The process is divided into three stages:

- injection
- blowing
- ejection.

Injection Stage Molten polymer is injected into a heated preform mould. The preform is the partly shaped product that will be used to make the final hollow product by being blown into shape. The preform consists of a fully formed neck with a thick tube of polymer attached.

Blowing Stage The preform is passed to the hollow, chilled blow mould. Compressed air is blown through the core pipe into the preformed polymer, inflating it and forcing it against the sides of the mould.

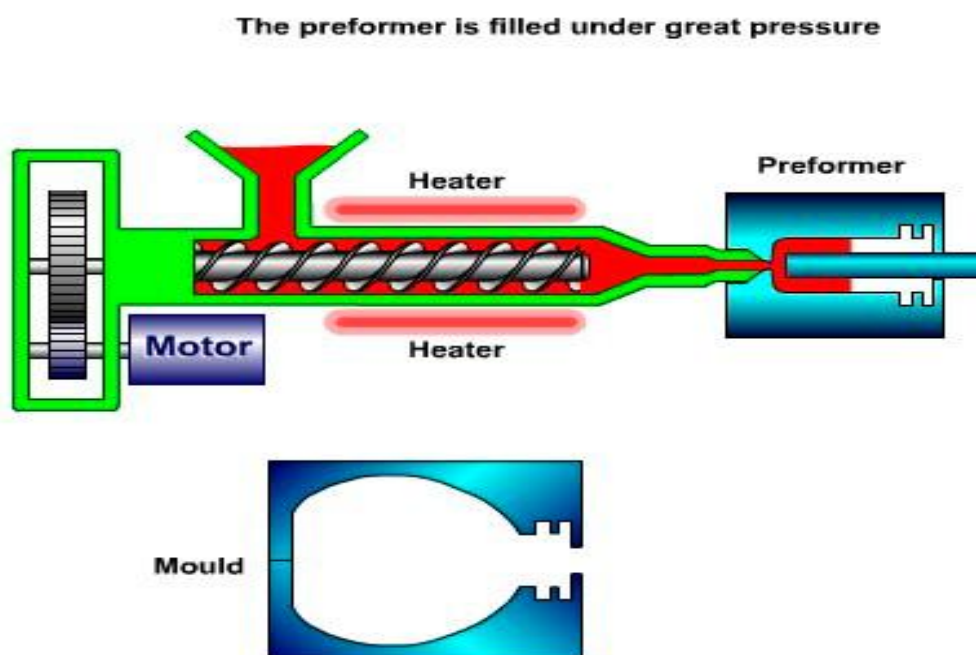
Ejection The blow formed polymer is allowed to cool. It is then removed from the blow mould and stripped off the core pipe. The product then passes to the quality control section and is tested for leaks.

Typical plastics used for injection blow moulding include:

- Polyethylene - Terephthalate (PET)
- Polypropylene (PP)
- Polyethylene (PE)
- Polyvinyl Chloride (PVC)

Step 1

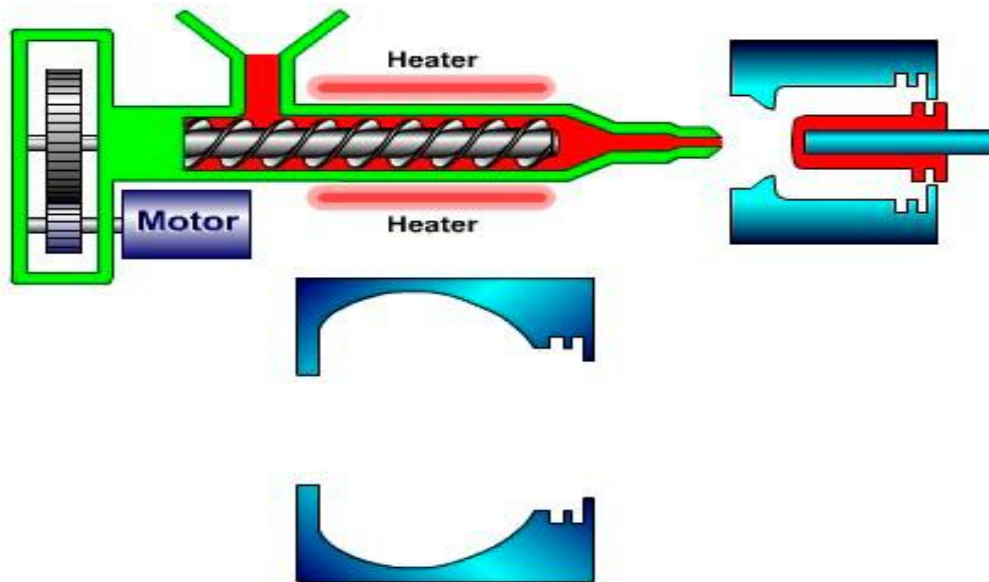
Molten polymer is injected into a heated preform mould.



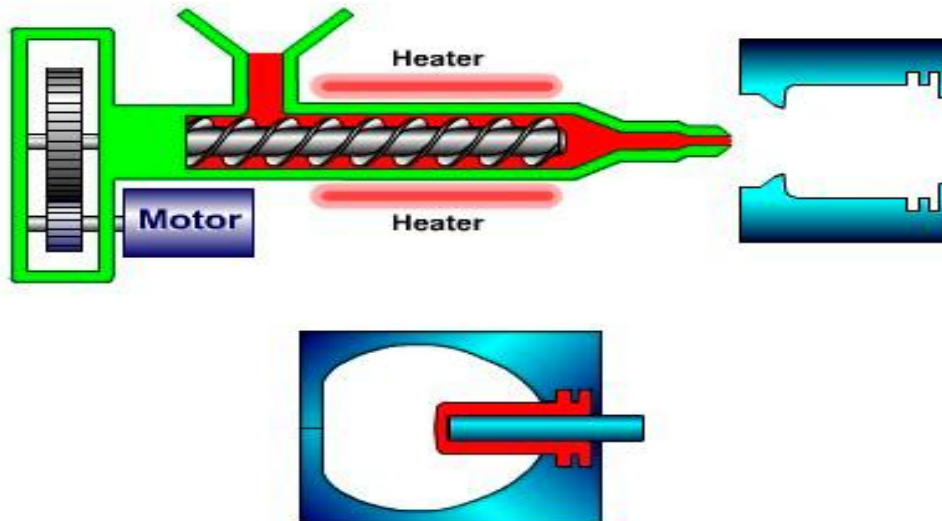
Step 2

The preform mould is opened and the preform is transferred to the mould.

The preformer is opened and the preformed polymer is transferred to the mould.



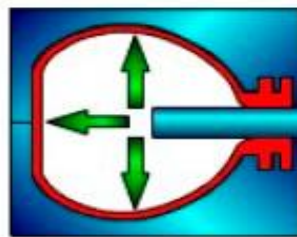
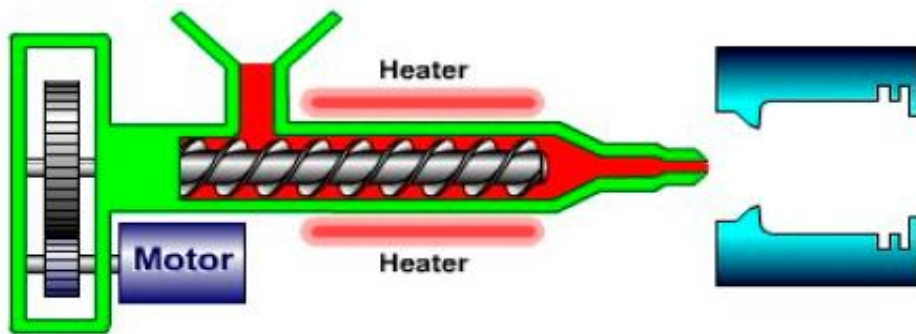
The preformer is opened and the preformed polymer is transferred to the mould.



Step 3

The mould is closed, clamping the preform neck in the mould. Air is blasted through the core pipe into the mould, inflating the preform and forcing it against the sides of the mould.

Air is blasted into the mould.



Air pressure forces the softened plastic against the sides of the mould.

Step 4

The cold mould chills and solidifies the inflated polymer moulding. The mould is opened and the moulding is stripped off the preformer core pipe. The preformer core pipe is returned to the preformer, in preparation for the next injection blow moulding cycle.

The plastic moulding is removed from the mould

