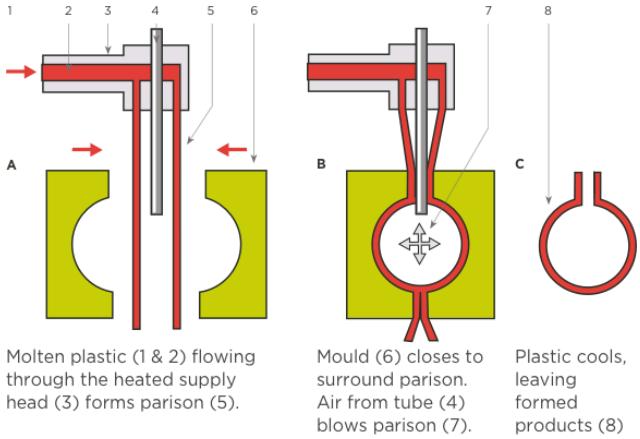
Moulding

Blow moulding:

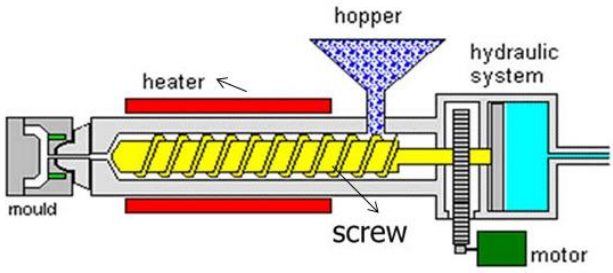


1. Plastic granules fed through hopper
2. Heated/melted along the Archimedes screw
3. Extruded into hollow tube (parison)
4. Tube is then clamped into metal mould
5. Air is pumped in to inflate mould
6. Product is ejected

Advantages	*Disadvantages*
• Intricate shapes can be formed • Can produce hollow shapes • Ideal for mass production	• High initial set up costs • Moulds are expensive to create

Uses: Plastic bottles, Containers

Injection moulding:

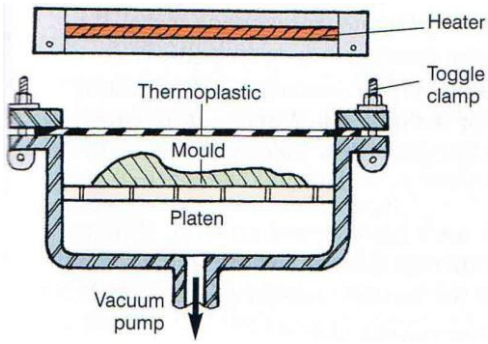


1. Plastic granules fed through hopper
2. Heated/melted along the Archimedes screw
3. Plastic injected into the mould
4. Two-part mould "negative" of the product
5. Product rapidly cooled and ejected from mould

Advantages	*Disadvantages*
• Ideal for mass production • Low unit cost • Precise moulding • High quality finish	• High initial set up costs • Moulds are expensive to create

Uses: Casings for electronic products, Containers for storage/packaging

Vacuum forming:

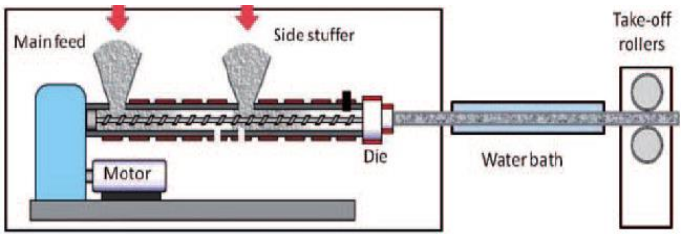


1. Create mould (air gaps, tapers, angles, rounded edges)
2. Place mould on the plated and lower
3. Clamp HIPS and heat until 'bouncy'
4. Raise platen into mould
5. Vacuum pump air out
6. Blowback little air to help release mould

Advantages	*Disadvantages*
• Ideal for batch production • Inexpensive • Easy to make moulds/can be modified • Low temperatures which reduces energy usage • Flexible manufacturing so can be modified	• Moulds need to be accurate to avoid webbing • Large amounts of waste materials produced -> environmental impact • Weak/thin (15mm max thickness)

Uses: Yoghurt pots, Blister packs, Inside of fridges

Extrusion:



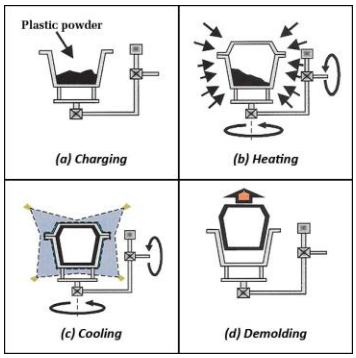
1. Plastic granules fed through hopper
2. Heated/melted along the Archimedes screw
3. Plastic injected into the mould
4. Extruded and cooled
5. Rollers pull plastic continuously

Advantages	*Disadvantages*
• Low cost relative to other moulding processes • Uses thermoplastics which can be remoulded • Waste material can be reused • Plastic can be manipulated after extrusion before fully cooled	• Hard to predict die swell (expansion) • Can only manufacture certain products

Uses: Collapsible tubes, guttering, straws, gear blanks

Rotational moulding:

1. Powdered polymer loaded into mould
2. Heat is applied to the mould
3. At the same time the mould is rotated
4. After some time, the mould is cooled and the component is removed



Advantages	*Disadvantages*
• Easy to produce large products • Uniform thickness • Corners of products are stress free • Colour integrally part of the product	• Lower volume production (slow) • Materials available are limited • Labour intensive

Uses: Buckets, Plastic footballs, Dustbins, Oil drums