

**MANUFACTURING PROCESSES:**

*KEY POINTS / QUESTIONS:*

*DETAILS / ANSWERS:*

**INJECTION MOULDING:**

Used for thermoplastics // Production is fast with little waste // e.g. Lunch boxes; Plastic granules are fed from the hopper into the injection moulding machine. The Archimedean screw transports the pellets up the barrel. The plastic is melted by the heat caused by friction along with the help of external heaters. In the final stage the screw moves forward to force the molten plastic into the split mould and ensure all cavities have been filled. The mould is then opened to allow the finished product to be removed.

**EXTRUSION:**

Used for thermoplastics // To produce continuous form lengths // e.g. Guttering; Plastic granules are fed from the hopper into the extruder. The Archimedean screw transports the pellets up the barrel. The plastic is melted by the heat caused by friction along with the help of external heaters. The molten plastic is fed through a die to give the desired shape. It is cooled as it leaves the die and then can be cut to length or coiled.

**CALENDERING:**

Used for thermoplastics // To produce continuous lengths of sheet // e.g. Cling film; The plastic material is passed through a series of heated rollers to gradually produce the required thickness. These sheets may then be cut to length or collected on a roll.

**COMPRESSION MOULDING:**

Used for thermosetting plastics // High quality finish // e.g. Electrical fittings; A measured quantity of polymer in slug or powder form is added to the split mould. The top mould half is lowered and the piece is formed with heat and pressure causing cross links.

**TRANSFER MOULDING:**

Used for thermosetting plastics // High quality finish // e.g. Socket covers; Moulding powder is added to the transfer pot where it is heated. The plunger is then lowered, forcing the polymer through feed runners into the mould cavity. The polymer solidifies and the piece is removed by the ejector pins.

**BLOW MOULDING:**

Used for thermoplastics // Hollow products // e.g. Plastic bottles; An extruded plastic tube called a parison is lowered and clamped in an airtight mould. Air is now blown into the parison forcing it to take the shape of the mould.

**VACUUM FORMING:**

Used for thermoplastics // e.g. RC car bodies; A plastic sheet is clamped into the machine and heated. Once malleable the heat is removed and the mould is raised. The vacuum is turned on and forces the sheet onto the mould, it is then removed and trimmed.

**ROTATIONAL MOULDING:**

Used for thermoplastics // e.g. Plastic footballs; A measured amount of polymer is placed into the shaped mould cavity. The mould is heated and rotated until the polymer lines it. It is then opened and the product is removed.

**Summary:**