

Compression Moulding Thermoplastics

Introduction

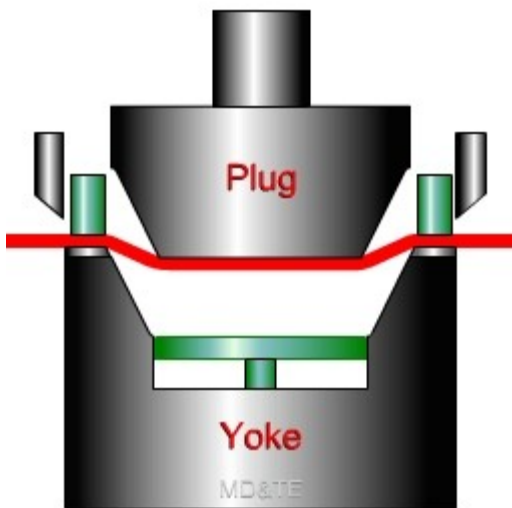
Thermoplastic sheet materials such as acrylic can be softened by heat. When a thermoplastic sheet has been softened, it can be bent, twisted, rolled and stretched. After the thermoplastic has cooled down, it becomes rigid and remains in its new deformed shape. This makes thermoplastic sheet materials suitable for:

- compression moulding using a plug and yoke
- line bending
- vacuum forming

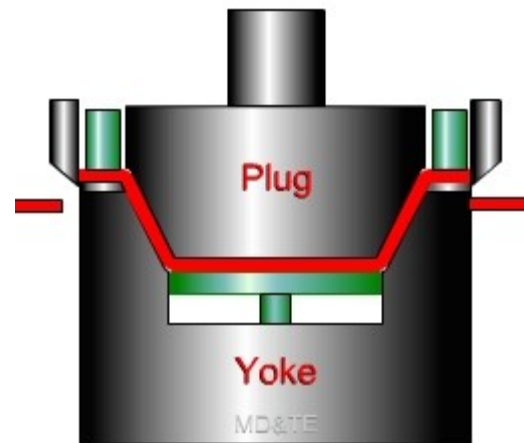
Turning thermoplastic sheets into products by compression moulding is called thermoforming. Thermoplastics typically used for thermoforming include:

- Polymethyl methacrylate (acrylic) also known as Perspex and Plexiglas (PMMA)
- Polystyrene (PS)
- Polypropylene (PP)
- Polyvinyl chloride (PVC)

Thermoforming, i.e. compression moulding using a plug and yoke



The plug pushes the softened thermoplastic sheet into the mould.



The waste material is trimmed off.

Forming thermoplastic sheets by compression moulding is a relatively quick way of making batches of identical products. The tools required are:

- an oven that is capable of heating a thermoplastic sheet until it is soft
- a mould (of the part that will be moulded). The mould is also called the yoke
- a plug that will force the thermoplastic sheet into the mould/yoke
- a mechanical or hydraulic press that will close the mould, (i.e. that will force the plug to push the thermoplastic sheet into the mould).

The process involves:

1. heating a thermoplastic sheet in an oven until it softens and becomes flexible
2. quickly taking the softened thermoplastic to the plug and yoke
3. placing the softened thermoplastic sheet over the hollow yoke, i.e. the mould
4. lowering the plug onto the softened thermoplastic sheet
5. using the plug to force the plastic sheet into the mould. This part of the operation takes great pressure and the plug is usually forced into the mould using a mechanical or hydraulic press.

The process must be carried out quickly so that the plastic sheet material is pressed into the yoke/mould while it is still soft.

Compression moulding very large batches of products

The process has been modified in industry so that it can be carried out quickly and repeatedly to make products such as vending machine drinks cups, meat trays and other food packaging products in very large quantities.

The process involves:

- feeding the thermoforming machine with plastic sheet material off a roll
- passing it through a heating stage
- locating it in a press that will press the sheet material into the yoke
- punching the formed product out of the sheet.