St Ivo Academy

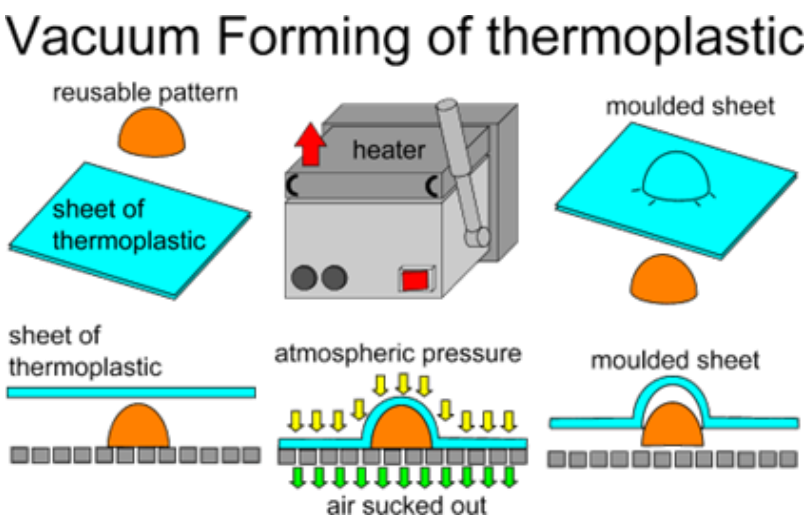
Design & Technology Department

Jitter Project

Knowledge Organiser

What is Vacuum Forming?

Vacuum forming is used to make simple moulds using thin sheets of thermoplastic. High impact polystyrene sheets are used in school (HIPS). PVC can also be used.



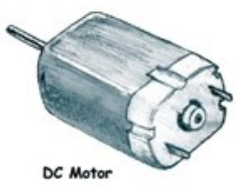
Components used in this project

What are components?
An electronic component is a basic electronic element. These components can be connected together to make circuits.

A tilt switch is a type of switch that switches on/off at a certain angle, as compared to the horizon.

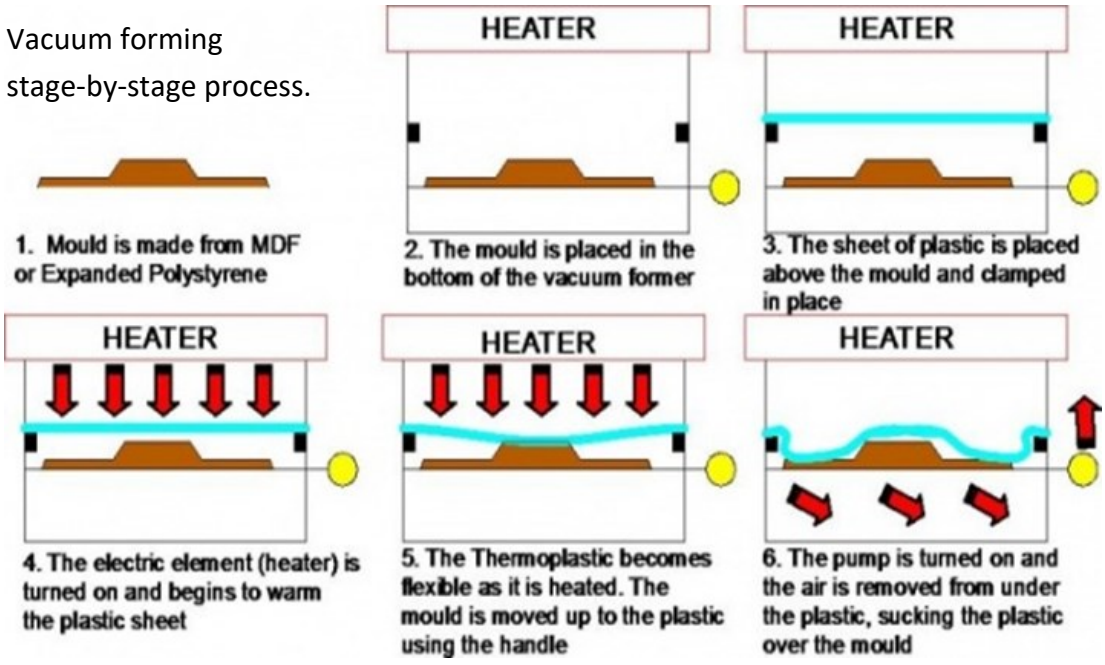
A battery (cell) is a device that converts chemical energy contained within its active materials, directly into electric energy.

A DC motor is a type of electric machine that converts electrical energy into mechanical energy.



THE PROCESS

Vacuum forming stage-by-stage process.

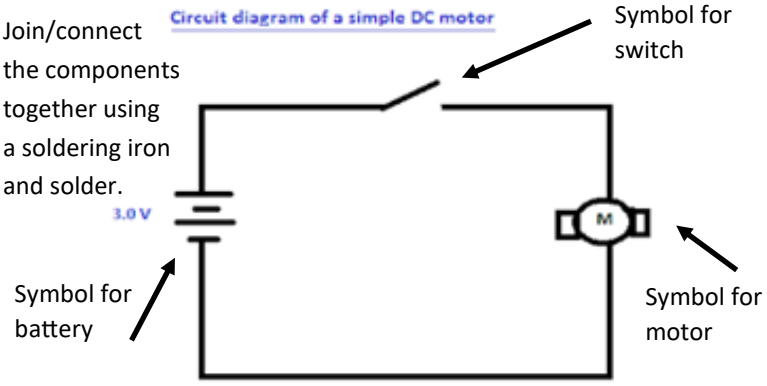


What are thermoplastics?

Thermoplastics don't resist heat. They can be formed into shapes by heat, melting or remoulding. They are easy to recycle, but not sustainable. Some examples of these are: high impact polystyrene (HIPS) and acrylic ((PMMA).

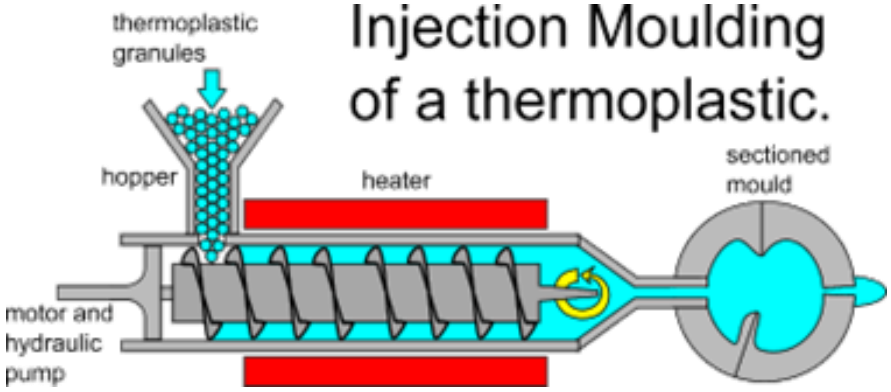
What is a Circuit?

A circuit is the path that an electric current travels on.
A simple circuit contains three components necessary to function.



What is Injection Moulding?

This technique is widely used for forming thermoplastic materials. The plastic (in a powdered or granular form) is put in a hopper. A screw thread turns forcing the plastic material through a heater, melting it. When all the materials are melted, the screw thread then acts as a ram and forces the plastic into a mould, where it cools and solidifies.



Gerbil Cutter

A common application is for trimming out shapes formed by a vacuum former from a sheet of plastic (HIPS). The advantage of the Gerbil over other techniques, such as using a saw or craft knife, is that the process is accurate, controllable and safer. The formings are cut out using a trimming disc. The disc works from inside the forming and produces a straight edge.

Remember to wear PPE and safety glasses.

Technical Terms

Design Specification

A design specification provides explicit information about the requirements for a product and how the product is to be put together.

Design Brief

A design brief is a written explanation given to a designer, outlining the aims, objectives and milestones of a design project.

Flowchart

A flow chart is a graphical or symbolic representation of a process. Each step in the process is represented by a different symbol and contains a short description of the process step. The flow chart symbols are linked together with arrows showing the process flow direction.

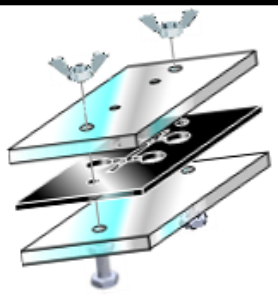
Mould

Is a hollow shape used when casting metal or a plastic.

Hardboard:

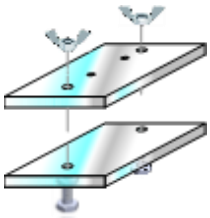
Hardboard is an engineered wood product. It is made from tiny fibres of soft-wood timber and has no natural grain structure. It is combined with wax and a resin binder and formed into panels by applying high temperature and pressure. It is reasonably cheap and has a smooth surface.

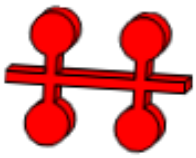
T he Process



The soft feet can be made by a simple injection moulding process, using a hot melt glue gun. The mould itself is sandwiched between a top & bottom plate. The whole assembly is held together by two bolts. The two smaller holes in the top plate are for glue to go in and air to come out

Hot melt glue sticks are made of a thermoplastic material, so they can be heated and moulded into new shapes over and over again. Position the glue gun nozzle into the ‘glue in’ hole in the top plate and squeeze the trigger to ‘inject’ the hot glue into the mould.





When the hot glue has cooled, remove the mould from the assembly and push out the feet. Cut the feet off the sprues with some scissors.

Remember not to touch the melted plastic or the end of the glue gun, as they are extremely hot.