

Plastic Categories

Thermoforming

Also known as thermoplastics, when heated the plastic becomes soft and flexible

Thermoplastics can be remoulded without affecting the material's physical properties

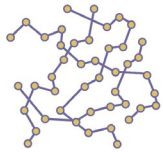
Thermosetting

Also known as thermosets, this plastic cannot be reformed once set in to shape

Thermosets have strong chemical bonds between the molecules, which do not separate on heating

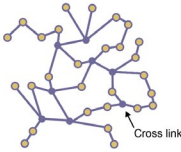
Molecular structure

Thermoforming plastics



Long chains of loose molecules that have no fixed structure or pattern

Thermosetting plastics



Individual monomers join to form a large polymer. These long chains of molecules are cross linked resulting in a rigid molecular structure

Woven Polypropylene and heat fused LDPE



DEVICE CASE

Movement and Motion

Linear motion

- Movement in one direction along a straight line

Reciprocating motion

- A repetitive back-and-forth or up-and-down linear action.

Motion is the action of something being moved.

There are different types of motion which can be added together and even changed from one to another.

Oscillating motion

- A repetitive back-and-forth motion along a curved path.

Rotary motion

- Objects moving in a circular motion usually around a fixed axis.

Synthetic Fibres

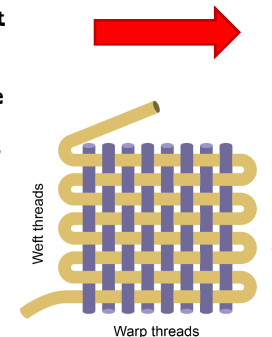
- Synthetic fabrics are made from different types of polymer, derived from petrochemicals
 - Dyes are added at the manufacturing stage, so a wide range of colours can be easily produced
 - Polyester and Polyamide (Nylon) are:
 - Hardwearing, with good strength
 - Non-absorbent and wash well
 - Easily blended with other fibres

Woven Textiles

Yarns are woven together to form fabric.

- The commonly used types are plain weave and twill weave.
- A loom weaves two threads – the warp and the weft - at right angles to each other.
- The self-finished edge is known as the selvedge, which stops the fabric from fraying.

Selecting fabrics



What are polymers?

Polymers are mostly synthetic materials

- They are usually derived from finite resources such as coal, natural gas or crude oil
- More renewable and sustainable materials such as vegetable starches are being used to make bio-plastics



What are the benefits of sourcing natural materials?

Biodegradable Polymers

Biodegradable polymers are made from vegetable starches, often corn-starch

- Common varieties include:
 - Polylactic acid (PLA) commonly used in 3D printing filament
 - Biopol is insoluble in water and will sink unlike the majority of 'plastics'. Used for disposable cups, surgical stitches, packaging, amongst other things.

Woven textiles

Hard wearing

Will fray when cut

Simple and most common weave

Available in a variety of weights

Breathable

KEYWORDS

Plastic, Polymer, Thermoforming, Thermosetting, Monomer, PLA, PHB, PCL, Biodegradable, Renewable, Finite, Linear, Reciprocating, Oscillating, Rotary, Woven, Synthetic Fibres, Weave, Warp, Weft, Selvedge

