

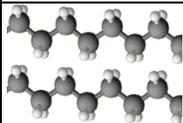
DT – Core Content - Polymers

Year 10



Thermoforming Polymers

Definition: Thermoforming polymers can be reshaped by applying heat.



Molecular structure: Thermoforming polymers contain long molecules that lie side by side. These can uncoil and slide past each other, making the material flexible.

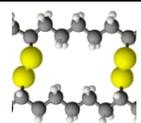
Can be recycled

Examples of Thermoforming Polymers

Name	Properties	Uses
Acrylic	Tough, easily finished, easily cleaned, food safe and can be easily scratched	Shop signs, car lights, baths
High-impact polystyrene (HIPS)	Lightweight, High stiffness, impact resistant but can scratch easily	Toys, television parts and refrigerator lamps
Biopol	Lightweight, good electrical insulator, degrades over time when in soil	Disposable cups, razors, cutlery

Thermosetting Polymers

Definition: A material that cannot be reshaped by reheating



Molecular structure: Cross-linking is where the polymer chains are chemically joined together in places (by covalent bonds) This makes the material less flexible. These are thermosetting polymers

Cannot be recycled

Examples of Thermosetting Polymers

Name	Properties	Uses
Polyester resin	Rigid, brittle, good electrical and heat insulation, good chemical resistance	Boat hulls, sports car bodies
Urea formaldehyde	Rigid, hard, brittle, heat resistant, excellent electrical insulation	Electrical fittings – plugs, sockets,

Key terms

Key term	Description
Brittleness	Inability to withstand sudden stress of shocks
Density	Compactness of a material, defined as mass per unit volume
Ductility	Ability to be deformed by bending, twisting or stretching
Durability	Ability to withstand deterioration over time
Elasticity	Ability to return to original shape once deforming force is removed
Electrical conductivity	Ability to conduct electricity
Hardness	Ability to resist deformation, indentation or penetration
Malleability	Ability to be permanently deformed in all directions without fracture
Plasticity	Ability to permanently deform without breaking when subjected to a force
Stability	Ability to resist changes in shape over time
Stiffness	Ability to resist bending
Thermal conductivity	Ability to conduct heat
Toughness	Ability to withstand sudden stress or shock

Isometric Drawing

1. Draw the edge of the cube.
2. Draw 2 lines at 30 degrees from the bottom of the line,
3. Repeat step 2, for the top of the line, then connect the parallel lines with a vertical line,
4. Draw parallel lines from each corner, at 30 degrees to finish the cube.

