

Unit 2 – Investigating Engineering Products

Learning Manufacturing Plastics (Polymers)

9th Dec 2021

L2 Engineering BTEC

Learning Objective:

- Review of previous lessons on material selection and design specifications
- To identify and explain the 4 main plastic manufacture methods
- To recognize examples of products made using them
- To be able to describe the main stages in each method
- To identify good points and bad points about each process

Starter Activity:

Work in individually and complete the activities below:

1. Identify basic and advance specifications
 2. Match material properties/qualities
- Timing 10mins
 - The teacher will call you randomly to share your answers with the class.

Use the drop down menu and choose the correct specification.

Legal and Safety Requirement

Material & Components

Ease of manufacturing

User requirement

Function

Ease of maintenance

Performance requirement

Form

Match the material properties and qualities

safety

Steel is a tough, hard and strong metal

Aesthetic

Steel can easily be manufactured in various shapes and sizes

cost

Steel is very abundant in the world as it comes from iron

availability

Steel lasts for a long time in a good condition, especially if it is coated with paint or plastic

Steel is cheap

Mechanical properties

Steel is safe

durability

Steel is sold publicly as it can be tested to get kite mark by the manufacturers

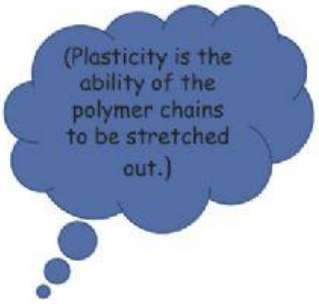
safety

Steel is shinny

Mechanical – Malleability/ductility

What is a “Polymer”

- A polymer is a material made up of loooooong chains of molecules.
- You know this material as “plastic”



(Plasticity is the ability of the polymer chains to be stretched out.)


- There are two types:

- Thermossoftening

- These plastics have generally more plasticity than the other kind, making them flexible but strong.
- They can be remoulded and are recyclable.

- Thermossetting

- These plastics are very rigid due to crosslinks between the molecules
- These are impossible to reuse.



(Crosslinks make the chains REALLY strong.)