

Engineering Plastics

Engineering plastics are a group of plastic materials that have better mechanical and/or thermal properties than the more widely used commodity plastics (such as polystyrene, PVC, polypropylene and polyethylene).

Being more expensive, engineering plastics are produced in lower quantities and tend to be used for smaller objects or low-volume applications (such as mechanical parts), rather than for bulk and high-volume ends (like containers and packaging).

Sources of Plastics

The main source of synthetic plastics is crude oil. **Coal** and natural gas are also used to produce plastics. Petrol, paraffin, lubricating oils and high petroleum gases are bi-products, produced during the refining of crude oil. These gases are broken down into monomers.



Thermosetting Plastics

Thermosetting plastics are made up from long chains of molecules that are cross-linked. They have a very rigid structure. Once heated, thermosetting plastics can be moulded, shaped and pressed into shapes. Once set they cannot be reheated since they are permanently set.



Uses

The main thermosetting plastics are epoxy resin, melamine formaldehyde, polyester resin and urea formaldehyde. Good electrical insulator, hard, brittle unless reinforced, resists chemicals well. Used for casting and encapsulation, adhesives, bonding of other materials.

Thermoplastic

A thermoplastic, or thermosoftening plastic, is a plastic polymer material that becomes pliable or moldable at a certain elevated temperature and solidifies upon cooling. Most thermoplastics have a high molecular weight.



Uses

- Acrylonitrile butadiene styrene (ABS) is a thermoplastic used to manufacture: Sports equipment. Toys (for example LEGO® blocks)
- Polycarbonate is used to make: CDs and DVDs. Drinking bottles. ...
- Polyethylene is probably the most common thermoplastic and is used to make: Shampoo bottles. Plastic grocery bags.

Important Trade names

- Acrylonitrile butadiene styrene (ABS)
- Nylon 6.
- Nylon 6-6.
- Polyamides (PA)
- Polybutylene terephthalate (PBT)
- Polycarbonates (PC)
- Polyetheretherketone (PEEK)
- Polyetherketone (PEK)

Plastic Coatings

A plastic coating gives metals a thick, wear resistant finish that excludes water and air from the surface of the metal and so prevents corrosion.

Plastic coating is applied mainly by: hot dip coating in a fluidised bed of polymer powder. hot dip coating a product in a vinyl Plastisol.

