

COMMON PLASTICS AND THEIR HISTORY

Natural plastics: waxes, resins (saps), cellulose, and natural rubber from rubber trees.

Celluloid and rayon: made from cellulose found in virtually all plants, celluloid became available in the late 1800s. It could be moulded and coloured to look very much like ivory and tortoiseshell. It was also used to make false teeth, shirt collars and cuffs and in 1900 when they worked out how to make it into thin strips it became movie film. It's still used today, most commonly as cellophane and ping pong balls.

Rayon was also developed in the early twentieth century as artificial silk.

Bakelite (phenolic): When phenol (C₆H₅OH) and formaldehyde (HCOH) were mixed they formed a sticky mass and when heated moulded then cooled and dried it became extremely hard. Later they worked out how to colour it. Bakelite was the first true plastic. It was cheap, strong, and durable could be moulded into thousands of shapes like radios, telephones, clocks, light fittings etc. It's only down side was it was brittle.

Polystyrene and PVC: Invented after the First World War polystyrene is a rigid, brittle plastic that is now used to make plastic model kits, disposable eating utensils, and a multitude of plastic pipes etc.

Nylon: invented in 1930 nylon revolutionised the clothing and fabric industries. Nylon fibre is very strong but also very flexible. The first application was for bristles for toothbrushes but the development of fine fibres meant it could be used instead of silk and cotton. Today it is also used to build hard wearing mechanical parts like gears, bearings, bushings, and other mechanical parts.

Synthetic rubber: The first synthetic rubber polymer was made in 1910. Neoprene is one product. It is highly resistant to heat and chemicals such as oil and gasoline, and is used in fuel hoses and as an insulating material in machinery as well as for wetsuits. There are many other uses for synthetic rubber from the every day items to military and space uses.

Acrylic, polyethylene (polythene), etc.: Acrylics are now well known for their use in paints and synthetic fibres, such as "fake furs". In sheets or slabs they are very hard and more transparent than glass and are used to replace glass and if coloured are now used to replace marble as bench and counter tops.

Polythene has been developed into two forms, "low density polyethylene" (LDPE), and "high density polyethylene" (HDPE). Both are cheap, flexible, durable, and chemically resistant. LDPE is used to make films and packaging materials. HDPE is used for containers, plumbing, and automotive fittings.

Polypropylene is similar to polyethylene, is cheap but it is much more robust and is used in everything from plastic bottles to carpets to plastic furniture, and is very heavily used in automobiles.

Glass-reinforced plastic (fibreglass) is used to build sporting boats, and carbon-epoxy composites are an increasingly important structural element in aircraft, as they are lightweight, strong, and heat resistant.

PET is a popular material for making bottles for "fizzy drinks" and for acidic drinks such as fruit or vegetable juices, can be made into fibres and is used for making mechanical parts, food trays, and other items that have to endure abuse. PET films are used as a base for recording tape.

[This material is based on the entry on www.wikipedia.org/2006]

