

Thermoplastic

Thermoplastic



Typical thermoplastic products

A **thermoplastic** (sometimes written as thermo plastic) is a type of plastic made from polymer resins that becomes a homogenized liquid when heated and hard when cooled. When frozen, however, a thermoplastic becomes glass-like and subject to fracture. These characteristics, which lend the material its name, are reversible. That is, it can be reheated, reshaped, and frozen repeatedly. This quality also makes thermoplastics recyclable.

There are dozens of kinds of thermoplastics, with each type varying in crystalline organization and density. Some types that are commonly produced today are polyurethane, polypropylene, polycarbonate, and acrylic. Celluloid, which is considered the first thermoplastic, made its appearance in the mid-1800s and

reigned in the industry for approximately 100 years. During its peak production, it was used as a substitute for ivory. Today, it is used to make guitar picks.

Sometimes, thermoplastics are confused with thermosetting plastics. Although they may sound the same, they actually possess very different properties. While thermoplastics can be melted to a liquid and cooled to a solid, thermosetting plastics chemically deteriorate when subjected to heat. Ironically, however, thermosetting plastics tend to be more durable when allowed to cool than many thermoplastics.

Thermosetting



A **thermosetting** plastic, also known as a thermoset, is polymer material that irreversibly cures. The cure may be done through heat (generally above 200 °C (392 °F)), through a chemical reaction (two-part epoxy, for example), or irradiation such as electron beam processing.

Thermoset materials are usually liquid or malleable prior to curing and designed to be molded into their final form, or used as adhesives. Others are solids like that of the molding compound used in semiconductors and integrated circuits (IC). Once hardened a thermoset resin cannot be reheated and melted back to a liquid form.

According to IUPAC recommendation: A thermosetting polymer is a prepolymer in a soft solid or viscous state that changes irreversibly into an infusible, insoluble polymer network by curing. Curing can be induced by the action of heat or suitable radiation, or both. A cured thermosetting polymer is called a thermoset.

Source:

<http://www.openelectrical.org/wiki/index.php?title=Thermoplastic>