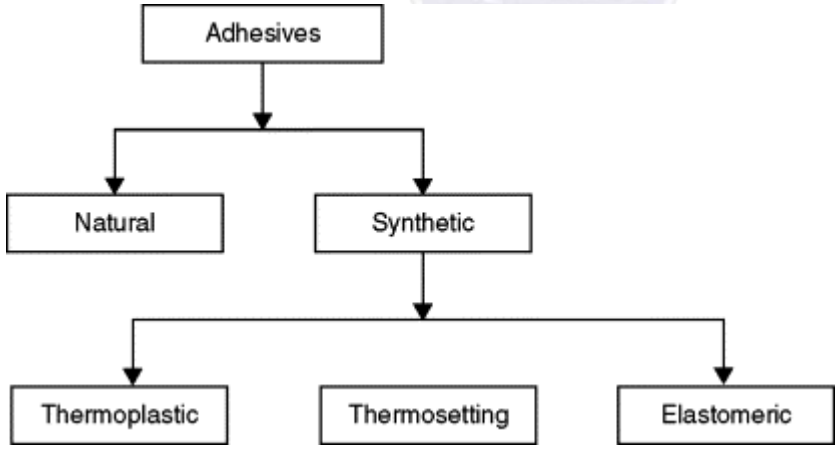
Adhesives

Adhesives may be classified as either organic or inorganic materials in a number of different ways.

The main areas using industrial adhesives are the following:
Construction
Consumer adhesives
Packaging
Transportation



Smart materials

Smart materials have properties that react to changes in their environment. This means that one of their properties can be changed by an external condition, such as **temperature**, light, **pressure**, electricity, voltage, pH, or chemical compounds.

This change is reversible and can be repeated many times.

Some types of smart materials include

•Piezoelectric – On applying a mechanical stress to these materials it generates an electric current. Piezoelectric microphones transform changes in pressure caused by sound waves into an electrical signal.

•Shape memory – After deformation of these materials they remember their original shape and return back to its original shape when heated .Applications include shape memory stents – tubes threaded into arteries that expand on heating to body temperature to allow increased blood flow.

•Thermo chromic – These are the materials which change their color in response to changes in temperature. They have been used in bathplugs that change color when the water is too hot.

•Photo chromic – These materials change color in response to changes in light conditions. Uses include security ink sand dolls that 'tan' in the sun.

•Magneto rheological: it is a fluid that fluids become solid when placed in a magnetic field. They can be used to construct dampers that suppress vibrations.

•**Smart materials** got vast **applications** in Aerospace, Mass transit, Marine, Automotive, Computers and other electronic devices, Consumer goods **applications**, Civil engineering, Medical equipment **applications**,

Plastics

Plastics are a wide range of synthetic or semi-synthetic organic compounds that are malleable and so can be molded into solid objects.

There are two types of plastics: thermoplastics and thermosetting polymers. Thermoplastics are the plastics that do not undergo chemical change in their composition when heated and can be molded again and again. Examples include polyethylene, polypropylene, polystyrene, polyvinyl chloride, and polytetrafluoroethylene (PTFE).

Features & Benefits ofThermoset plastics
They significantly improve the material's mechanical properties, providing enhances chemical resistance, heat resistance and structural integrity. Thermoset plastics are often used for sealed products due to their resistance to deformation.

Pros
More resistant to high temperatures than thermoplastics
Highly flexible design
Thick to thin wall capabilities
Excellent aesthetic appearance
High levels of dimensional stability
Cost-effective
Cons
Cannot be recycled
More difficult to surface finish
Cannot be remolded or reshaped

Thermoplastics

Thermoplastics Curing Process

Thermoplastics pellets soften when heated and become more fluid as additional heat is applied. The curing process is completely reversible as no chemical bonding takes place. This characteristic allows thermoplastics to be remolded and recycled without negatively affecting the material's physical properties.

Features & Benefits

There are multiple thermoplastic resins that offer various performance benefits, but most materials commonly offer high strength, shrink-resistance and easy bendability. Depending on the resin, thermoplastics can serve low-stress applications such as plastic bags or high-stress mechanical parts.

Pros

Highly recyclable
Aesthetically-superior finishes
High-impact resistance
Remolding/reshaping capabilities
Chemical resistant
Hard crystalline or rubbery surface options
Eco-friendly manufacturing

Cons

Generally more expensive than thermoset
Can melt if heated

Plastic coating

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
spraying polymer powder onto a heated product

Applications of plastics in automobile and domestic use.

automotive plastics find application in interior & exterior furnishings, power train, chassis, electrical components, and under the hood parts. It is employed in the dashboard, bumpers seats, body panels, fuel systems, interior trim, under-bonnet components, lighting, exterior trim, liquid reservoirs, and upholstery.