



UDC 678.5

FEATURES AND BENEFITS OF PLASTICS AND COMPOSITE MATERIALS

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Object and subject of research

The object of research is plastic and composite products. Plastics are used to manufacture an incredible number of products we use every day, such as beverage and food containers, trash bags and grocery bags, cups and utensils, children's toys and diapers, and bottles for everything from mouthwash and shampoo to glass cleaner and dishwashing liquid. And that's not even counting all the plastic that goes into furniture, appliances, computers, and automobiles.

Scientific novelty

Every day, people use plastics in various applications. Over the last 50 to 60 years, the use of plastic has expanded and penetrated virtually into every aspect of life. Because of how versatile the material is, and how affordable it can be, it has taken the place of other products including wood and metals. The properties of the various types of plastics make it beneficial for manufacturers to use. Consumers like it because it is easy to use, lightweight and easy to maintain.

The result of the study

Plastics is the term commonly used to describe a wide range of synthetic or semi-synthetic materials that are used in a huge and growing range of applications. Everywhere you look, you will find plastics. We use plastic products to help make our lives cleaner, easier and more enjoyable. We find plastics in the clothes we wear, the houses we live in, and the cars we travel in.

The term "plastic" is derived from the Greek word "plastikos", meaning fit for moulding. This refers to the material's malleability, or plasticity during manufacture, which allows it to be cast, pressed, or extruded into a variety of shapes - such as films, fibres, tubes, plates, bottles, boxes, and much more.

The versatility of plastic materials comes from the ability to mold, laminate or shape them, and adapt them physically and chemically. There is a plastic suitable for almost any application. Plastics do not corrode, though they can degrade in UV (a component of sunlight) and can be affected by solvents — for example, PVC plastic is soluble in acetone.

However, because many plastics are so durable and do not corrode, they create considerable disposal problems. They are not good for the landfill as many will persist for hundreds of years and when incinerated, dangerous gases can be produced. Many supermarkets now give us one-time grocery bags — leave them in a cupboard for a year and all you will have left is dust — they are engineered to degrade. Perversely, some plastics can be cured (hardened) by UV — that just goes to show how varied their formulas are.

There are two main types of plastics, thermoset plastics and thermoplastics. Down further, you can see the everyday uses of each type. With thermoset plastics, the plastic will hold its shape long term once it has cooled to room temperature and hardened thoroughly.

This type of plastic cannot return to its original form - it cannot be melted down into its original form. Epoxy resins and polyurethanes are some examples of this type of thermosetting plastic. It is commonly used in tires, auto parts, and composites.

The second category is thermoplastics. Here, you have more flexibility and versatility. Because it will return to its original form when heated, these plastics are commonly used in various applications. They can be made into films, fibers, and other forms.

Specific Types of Plastics



Below are some of the specific types of plastics and how they are in use today. Consider their chemical properties and benefits, too:

PET or Polyethylene terephthalate – this plastic is ideal for food storage and water bottles. It is commonly used for things like storage bags, too. It does not leach into the food, but is sturdy and can be drawn into fibers or films.

PVC or Polyvinyl Chloride -it is brittle but stabilizers are added to it. This makes it a softer plastic that's easy to mold into various shapes. It is commonly used in plumbing applications because of its durability.

Polystyrene - Commonly known as Styrofoam, it is one of the less ideal options today for environmental reasons. However, it is very lightweight, easy to mold and it works as an insulator. That is why it is heavily used in furniture, cabinetry, glasses and other impact-resistant surfaces. It is also commonly added with a blowing agent to create foam insulation.

Polyvinylidene Chloride (PVC) - Commonly known as Saran, this plastic is used in wraps to cover food. It is impermeable to odors from food and can be drawn into various films.

Polytetrafluoroethylene – a growing popular choice is this plastic also known as Teflon. First manufactured by DuPont in 1938, it is a heat-resistant form of plastic. It is very stable and strong and is unlikely to be damaged by chemicals. Moreover, it creates a surface that is almost frictionless. This is why it is used in various cookware (nothing sticks to it) and in tubing, plumbing tapes and in waterproof coating products.

Polypropylene - Commonly called just PP, this plastic has various forms. However, it has uses in many applications including tubes, car trims, and bags.

Polyethylene - Also known as HDPE or LDPE, it is one of the most common forms of plastics. New formations of it make it possible for this plastic to be flat. Its initial uses were for electrical wires but it is now found in many disposable products, including gloves and garbage bags. It is also used in other film applications such as wraps, as well as in bottles.

In conclusion, we would like to say that plastics are extremely versatile materials and are ideal for a wide range of consumer and industrial applications. The use of plastics every day is more commonplace than many might think. By making small changes to these chemicals, new and versatile solutions are obtained.

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