**HIGH DENSITY POLY ETHYLENE (HDPE)**

High Density Poly Ethylene (HDPE) is a thermoplastic polymer made from petroleum. As one of the most versatile plastic materials around, HDPE plastic is used in a wide variety of applications, including plastic bottles, milk jugs, shampoo bottles, bleach bottles, cutting boards, and piping. Known for its outstanding tensile strength and large strength-to-density ratio, HDPE plastic has a high-impact resistance and melting point.

**LOW DENSITY POLYETHYLENE (LDPE)**

LDPE (low density polyethylene) is a soft, flexible, lightweight plastic material. LDPE is noted for its low temperature flexibility, toughness, and corrosion resistance. It is not suited for applications where stiffness, high temperature resistance and structural strength are required. It is often used for orthotics and prosthetics. LDPE has good chemical and impact resistance and is easy to fabricate and form.

**POLYPROPYLENE (PP)**

Polypropylene is a tough, rigid and crystalline thermoplastic produced from propene (or propylene) monomer. It is a linear hydrocarbon resin. PP belongs to polyolefin family of polymers and is one of the top three widely used polymers today. Polypropylene has applications both as a plastic and a fiber in:

* Automotive Industry
* Industrial Applications
* Consumer Goods, and
* Furniture Market

**POLY VINYL CHLORIDE (PVC)**

Polyvinyl Chloride (PVC) is one of the most commonly used thermoplastic polymers worldwide. It is naturally white and very brittle (before the additions of plasticizers) plastic. Commercially, PVC is one of the most important thermoplastics in the world today. Rigid (unplasticized) PVC is one of the most widely used plastic materials. Main applications of both types of PVC (rigid and flexible) include construction, domestic, packaging, automotive, medical, toys, clothing, wires and cables.

**POLYSTYRENE (PS)**

Polystyrene (PS) is a polymer made from the monomer styrene, a liquid hydrocarbon that is commercially manufactured from petroleum. At room temperature, PS is normally a solid thermoplastic but can be melted at higher temperature for moulding or extrusion, then resolidified. Styrene is an aromatic monomer and PS is an aromatic polymer.

Polystyrene is used in a wide range of applications, including:

* Packaging
* Household appliances.
* Consumer electronics products.
* Building and construction, for example insulation foam, panels, bath and shower units, lighting and plumbing fixtures.
* Medical items such as tissue culture trays, test tubes, petri dishes, diagnostic components, and housing for test kits.
* **EXPANDED POLYSTYRENE (EPS) :**

Expanded polystyrene, or EPS, is widely used commodity polymer. It has been a material of choice for more than 50 years because of its versatility, performance and cost effectiveness. It is widely used in many everyday applications, such as fish boxes, bicycle helmets and insulation material.

EPS is used in many applications, including:

* Thermal insulation in buildings.
* Road construction.
* Sound insulation.
* Packaging.
* Food packaging to maintain the temperature of hot or cold food and prevent spoilage.
* Protection for valuable and fragile goods.
* Crash helmets.
* Windsurfing boards.

* **Extruded Polystyrene (XPS):**

Extruded Polystyrene (XPS), is manufactured via an extrusion process where plastic resin and other additives are combined and extruded through a die. The extruded foam then cools and expands into it’s final shape.

Similarly as EPS, XPS has a wide variety of applications. It can be used for the insulation of buildings, roofs and concrete floors. Extruded polystyrene material can be also used in crafts and model building, in particular architectural models.

* **HIGH IMPACT POLYSTYRENE (HIPS) :**

High Impact Polystyrene or HIPS is one of the existing varieties within polystyrenes. Since polystyrene is a very fragile polymer at room temperature, it is modified by the addition of polybutadiene to improve its resistance to impact.

Premium HIPS Filament (High Impact Polystyrene) is a thermoplastic obtained by polymerizing high impact resistance. It is known as "High Impact Polystyrene" and used as support material ABS or PLA prints.

Premium HIPS (Polystyrene) filament is resistant to oils, fats and alkalis but not fuel. As for his post-processing and finishing it can be chrome, paint, glue and sand. HIPS supports evil UV rays, so long exposure to sun fade and become brittle him. It has low electrical conductivity, so it can be used as insulation.

* **GENERAL PURPOSE POLYSTYRENE (GPPS):**

GPPS - General Purpose polystyrene resins are transparent polymers resulting from the polymerization of Styrene Monomer. GP Polystyrene can be used for both injection moulding and extrusion applications.

**Benefits and features:**

• Excellent flow properties

• High heat resistance

• High molecular weight

• High transparency

• Ease of processing

• Low shrinkage

• Very low moisture absorption

**Applications:**

• Thin wall packaging

• Extrusion Foamed packaging

• POS Display stands

• Disposable housewares and cutlery

• Sorting boxes

• Blending with HIPS for FFS thermoforming

• XPS Insulation

• Medical labware and utensils

• BOPS Sheet

• Blending with SBC for transparent impact applications

**Acrylonitrile Butadiene Styrene (ABS) :**

ABS or Acrylonitrile butadiene styrene is a common thermoplastic polymer typically used for injection molding applications. This engineering plastic is popular due to its low production cost and the ease with which the material is machined by plastic manufacturers. Better yet, its natural benefits of affordability and machinability do not hinder the ABS material’s desired properties:

* Impact Resistance
* Structural Strength and Stiffness
* Chemical Resistance
* Excellent High and Low Temperature Performance
* Great Electrical Insulation Properties
* Easy to Paint and Glue