

SAN (Styrene Acrylonitrile) is a copolymer of styrene and acrylonitrile. It offers superior mechanical properties, chemical resistance and heat resistance in comparison with general purpose polystyrene resin. The product shows comparable levels of impact, heat and chemical resistance with PMMA. Surface gloss, dimensional stability, mechanical strength and electrical properties of SAN are superior to GPPS, and it can be more easily processed than acrylic resins. In general, due to the nature of the molecular structure, SAN resin tends to be yellowish and lose the transparency after injection molding.

Styrene-based materials offer unique characteristics of durability, high performance, versatility of design, simplicity of production, and economy. They can provide excellent hygiene, sanitation, and safety benefits. And many of these products offer very good insulation qualities and the ability to be recycled where collection systems are made available, making sound use of our natural resources. In many cases, styrene helps create products that are very unique, and for which there are few effective substitutes.

ABS

Styrene-based materials offer unique characteristics of durability, high performance, versatility of design, simplicity of production, and economy. They can provide excellent hygiene, sanitation, and safety benefits. And many of these products offer very good insulation qualities and the ability to be recycled where collection systems are made available, making sound use of our natural resources. In many cases, styrene helps create products that are very unique, and for which there are few effective substitutes. The following is only a sampling to show the tremendous impact styrene has on the things that shape and enhance our daily lives.

PEEK

Poly(etheretherketone) (**PEEK**) is a high performance thermoplastic generally used with fiber reinforcements such as glass, carbon, or Kevlar.

The unique combination of properties, including ease of processing, means PEEK polymer is used in a wide range of applications including aerospace, automotive, electronics, industrial, food and medical.

Thanks to its proven ability to withstand hostile environments, PEEK polymer is becoming the material of choice for responding to greater product performance demands.

PEEK characteristics include: High Temperature Performance, Strength & Toughness, Radiation Resistance, Low Flammability, Low Smoke and Toxic Gas Emission, Hydrolysis Resistance, Electrical Properties, Processing, High strength, Inherent purity, High repeat autoclavability, Chemical resistance, Impact and wear resistance, Processing and design flexibility,

ACETAL

Acetals, technically polyoxymethylenes (POM), are highly crystalline engineering thermoplastic resins. Performance characteristics combine high strength and rigidity, unusual resilience, outstanding static and dynamic fatigue resistance, natural lubricity, and resistance to a wide range of solvents, oils, greases and chemicals. Very low moisture absorption results in excellent dimensional stability, and maintenance of performance characteristics over a wide range of humidity.

The two major variants can often be used interchangeably. Since we supply both types, we can offer an impartial recommendation in cases where processing or end-use performance differences could be significant.

POM (Polyoxymethylene, homopolymer and copolymer acetal) is the engineering plastic produced by gas phase polymerization. They are semi-crystalline thermoplastics with high wear resistance and abrasion resistance.

POM resin contains excessive moisture, then poor appearance quality such as silver streaks, and inferior functions of molded products may result.

Acetal Characteristics:

Excellent mechanical, thermal and chemical properties, Wide range of temperature for an extended period, Good self-lubrication, friction-resistance and abrasion-resistance, High rigidity and conductivity

Acetal Applications:

Casings of pumps and pivot bearings, Gear casings, PCB holders and cassette decks, Pump parts of inkjet printers, Keyboard keys, Bracket motors, VCR gears, Gears of copying machines, Printer gears, Non-reinforcement Gears, Switch boxes, CD-ROM main bases, VCR main bases and video gears, VCR Reel, Speaker grilles and zippers,

Low-noise gears, Pen fill, Belt parts of automobile, Seat belt retractors, Friction resistance and abrasion resistance, Gears and conveyor belt parts,

Camera gears, Printer roller pumps, Gear worm wheels, VCR gears, Printer gears.

Characteristics: Outdoor weatherability, Blendability, Heat resistance, High gloss, Color stability, UV stability, Chemical resistance

Application: Injection, extrusion, Automotive mirror housings, Exterior trim components,

Extruded solid profiles for window lineals and door profiles, Cap stock for co-extruded house siding and windows, Gutter systems and fencing, Vending machine trim, RV, Travel trailer and mobile home components, Spa and pool steps, Housings for garden tractors, Snowmobiles, and Small water craft.

EVA

EVA (Ethylene Vinyl Acetate) is the copolymer of ethylene and vinyl acetate comonomer, a new class of plastic materials. They retain many of the properties of polyethylene, but have considerably increased flexibility for their density. Elongation and impact resistance are also increased. EVA is well known for its superior quality in clarity, softness, resilience and impact strength. Its application includes shoe sole, extrusion coating, and greenhouse film.

Characteristics Excellent processing and mechanical properties.

Excellent environment stress crack resistance and chemical resistance.

Excellent electric properties and durability.

HDPE

High Density Polyethylene (HDPE): HDPE refers to a plastic used to make bottles for milk, juice, water and laundry products. Unpigmented HDPE bottles are translucent and have good barrier properties and stiffness. They are well-suited to packaging products with short shelf lives such as milk, margarine tubs and yogurt containers. Because HDPE has good chemical resistance, it is used for packaging many household as well as industrial chemical such as detergents and bleach. Pigmented HDPE bottles generally have better stress crack and chemical resistance than bottles made from unpigmented HDPE.

Stiffness, strength/toughness, resistance to chemicals and moisture, permeability to gas, ease of processing, ease of forming.

HDPE (High Density Polyethylene) is the plastic used mainly to make milk bottles and many other types including liquid detergent and cleaning solution bottles. HDPE has the highest amount of usage for any plastic and is the second most recycled plastics. HDPE is more rigid and harder than lower density materials. It also has a higher tensile strength, four times that of low density polyethylene, and is three times better in compressive strength.

HDPE which is produced under the low-pressure polymerization manufacturing process, was developed in 1954 by Hoechst (Germany) and Philips (U.S.A.). Since then, thanks to the technical support from these two companies to Europe and Japan, HDPE has become one of the most produced resins in the world.

HDPE characteristics include: Excellent processing and mechanical properties, Excellent environment stress crack resistance and chemical resistance, Excellent electric properties and durability.

HDPE Applications include: Caps for beverage bottles, Pallets for all uses, Containers, Dust bin, Pails and bottle cap for mineral water, Transport and stacking crates, Bottle crates, Silicone Cartridge, Toys complicated parts, Light-weight household

Film grade: Merchandise bags, Consumer trash bags, Industrial and institutional liners, Consumer trash bags, Merchandise bags, Consumer trash bags,

Blow molding L Small bottle, Shampoo and cleaner bottles 20 liter containers, Oil bottle, General purpose containers

Pipe extrusion: Pressure pipes for water and gas, Sewage pipe, Cable protection pipe, Corrugated pipes for tele-communication cable, Sewage pipe, Cable protection pipe, Corrugated pipes for building wire.

LDPE

Low Density Polyethylene (LDPE): A plastic used predominately in film applications due to its toughness, flexibility and relative transparency, making it popular for use in applications where heat sealing is necessary. LDPE is also used to manufacture some flexible lids and bottles and it is widely used in wire and cable applications for its properties and processing characteristics.

Ease of processing, barrier to moisture, strength/toughness, flexibility, ease of sealing.

LDPE (Low Density Polyethylene) is the plastic used mainly to make film for trash bags, food packaging, shrink films, and construction/agricultural films.

LDPE Characteristics include: Superb transparency and processability. These products are suitable for special agricultural applications such as long-life and anti-fogging films due to their excellent miscibility characteristic with various master batches,

Outstanding processability and superb blending characteristic with additives. Molecular weight, melt index, and density of these products are specifically designed to satisfy the demanding requirements of foaming processes.

chemical resistance, superior transparency, processability and rigidity, which make this grade suitable for multi-layer containers.

MDPE

MDPE combines the characteristics of low and high density polyethylene. Bottles are less translucent than LDPE but more flexible than HDPE. Like LDPE, MDPE is glossy when produced in colors. MDPE resins represent a small percentage of overall film-grade resins. This resin is commonly used as a low-cost alternative to other resins in film applications where strength is not required, such as consumer paper goods

Nylon.

Typical applications for nylons are in automotive parts, electrical/electronic uses, and packaging.

Uses: airbags, belts and hoses, luggage, and tires.

Nylon 6 (Polyamide 6) resin is used as raw materials of fiber, film and engineering plastic. Nylon fiber is utilized to make garment and industrial fiber. Nylon film is used for food packaging or vacuum or gas packed containers. Engineering plastic is replacing the previous metals at a rapid pace.

Nylon represents the generic name for all synthetic fiber-forming polyamides. It can be formed into mono-filaments and yarns characterized by great toughness, strength and elasticity, high melt point, and good resistance to water and chemicals. The material is widely used for bristles in industrial and domestic brushes, and for many textile applications. It is also used in injection molding gears, bearings, combs, and for an enormous range of components and machine parts. They are also used as high-quality electrical insulation materials, as well as for many specialized applications.

Characteristics include: Good mechanical properties, Extreme toughness, Outstanding self-lubrication and abrasion resistance,

Excellent chemical resistance, Wide usage temperature, Good impact absorbing characteristics.

PBT

Thermoplastic Polyesters - **PBT** - Polybutylene terephthalate, **PBT**, is a semi-crystalline engineering thermoplastic resin that has gained wide acceptance since its commercialization in the early 1970's.

Unreinforced grades offer performance typical of a crystalline polymer, combining good strength and stiffness with low moisture absorption, exceptional thermal stability, excellent electrical insulation properties, outstanding dimensional stability and resistance to the effects of a wide range of chemicals, solvents, and oils.

A wide range of reinforced and modified grades offer opportunities to tailor performance to meet specific application demands. Formulations based on **PBT** alone, or alloyed with PET or other polymers, are available, all exhibiting very easy processing characteristics, and offering cost-effective solutions to application demands in every end-use category

PC-ABS

PC/ABS features the favorable characteristics of ABS such as moldability, better impact strength at low temperatures, and metal plating. It is a remarkable engineering plastic with the essential properties needed for engineering plastics. The product explicitly shows character by combining the excellent mechanical and electrical properties, heat resistance, dimensional stability of polycarbonate, and the high qualities of ABS such as workability, and secondary processability. Moreover, the heat stability, weather resistance, and flame retardance promote the plastic's usefulness as a material in automobiles, electric and electronic goods. Flame retardant plastics are essential for fire safety. It is a remarkable flame retardance, but also super-weather resistance and heat stability. It also completely solved the toxic problems caused during the combustion of halogen flame retardants.

PC/ABS Characteristics include:

Processability, Mechanical properties, Chemical resistance, Dimensional stability, Remarkable heat stability, Weather resistance

PC/ABS uses: Hand phones, Car phones, Wheel caps, Work station housing, Refrigerator door handles, Instrument panels, Notebook PC housing, Lap top housing, Monitors, Facsimile frames, Camera parts, Products requiring dimensional stability, Products requiring high rigidity, CD-Rom, Monitor, Note pc's.

PC/PBT

PC/PBT is one of a family of alloys combining thermoplastic polyester with polycarbonate. This compound offers a viscosity suitable for general purpose injection molding applications and is lubricated for ease of mold release.

PC/PBT exhibits excellent impact strength with excellent chemical resistance. Drying of this compound is strongly recommended prior to processing to optimize mechanical performance and surface appearance.

PEI

Polyetherimide is a high-performance thermoplastic. This material is characterized by high strength and rigidity at elevated temperatures, long-term heat resistance, highly dimensional stability, good electrical properties, broad chemical resistance and is injection moldable. Also, it exhibits an inherent flame resistance and a low smoke generation without the need for incorporating additives.

Polyetherimide resists a wide range of chemicals including most hydrocarbons, alcohol's, and fully halogenated solvents. It resists mineral acids and tolerates short-term exposure to mild bases.

PES

PES (Polyether sulfone) is an amorphous engineering thermoplastic resin with good high temperature resistance.

It has excellent resistance to hydrolysis and repeated sterilization. Its outstanding rigidity and mechanical properties are little affected even at a continuous use temperature of about 185 C.

PES can be processed by all the common techniques adopted for thermoplastics like injection molding, blow molding and extrusion. The resins and compounds can be recycled a number of times without any significant loss in properties.

PES characteristics include: Very high rigidity, good dielectric properties, high mechanical strength, good dimensional stability, good resistance to hydrolysis and sterilization, good oxidative stability, and inherent flame retardance.

PET

Polyethylene Terephthalate: PET is clear, tough and has good gas and moisture barrier properties. This plastic is commonly used in PET soft drink bottles and many other injection-molded consumer product containers. Other applications include strapping, molding compounds and both food and non-food containers. Cleaned, recycled PET flakes and pellets are in great demand for spinning fiber for carpet yarns and producing fiberfill and geotextiles. Polyester is its nickname.

Clarity, strength/toughness, barrier to gas and moisture, resistance to heat.

PET (Polyethylene Terephthalate) resin is used to make PET bottles that are rapidly replacing the previous glass bottles and aluminum cans as food and beverage containers because they are safe, transparent, reliable, chemical-resistant, light, easily moldable and economical. According to the condition of polymerization and amount of additives, there are three types of resins : resins for the containers of bottled water and medicine, resins for soda bottles, and resins for bottles of fruit drinks, ionized beverage and tea. PET bottles come in various colors and designs. .

Polycarbonate

Polycarbonate is a high performance engineering thermoplastic of largely amorphous structure, which therefore in unreinforced and unmodified form exhibits excellent transparency. The performance characteristics of parts molded in polycarbonate include exceptional toughness (especially in thinner wall section parts), good strength, stiffness and creep resistance, and electrical insulation performance independent of temperature.

Combining low mold shrinkage with very low moisture absorption, parts in polycarbonate can be molded to, and maintain, very close dimensional tolerances. Polycarbonate / ABS Alloys - This family of alloys combines the best characteristics of polycarbonate and ABS, and offers a cost-effective choice where exceptional toughness, maintained at low temperatures, combined with excellent strength and rigidity, is required. These materials process easily to produce parts of outstanding surface appearance.

PP

Polypropylene (PP): Polypropylene has excellent chemical resistance, is strong and has the lowest density of the plastics used in packaging. It has a high melting point, making it ideal for hot-fill liquids. PP is found in everything from flexible and rigid packaging to fibers and large molded parts for automotive and consumer products. Strength/toughness, resistance to chemicals, resistance to heat, barrier to moisture, versatility, resistance to grease/oil.

PP (Polypropylene) is a tough, lightweight rigid plastic.

Characteristics include: Excellent processing and mechanical properties, Excellent environment stress crack resistance and chemical resistance.

PS

Polystyrene (PS): Polystyrene is a very versatile plastic that can be rigid or foamed. General purpose polystyrene is clear, hard and brittle. It has a relatively low melting point. Typical applications include protective packaging, containers, lids, cups, bottles and trays.

Versatility, insulation, clarity, and easily formed.

HIPS (High Impact Polystyrene) is a water-white thermoplastic produced by the polymerization of styrene (vinyl benzene). The electrical insulating properties of polystyrene are outstandingly good and the material is relatively unaffected by moisture.

HIPS is made by dissolving the rubber in a styrene monomer and then polymerizing the styrene in the usual way. HIPS retains higher rubber content from 5 to 15% to increase impact strength, thus making it useful for products requiring such properties. In addition, due to high heat resistance and fluidity, products can be made by various processing methods such as injection molding, extrusion, vacuum forming and blow molding.

Polystyrene characteristics include: Excellent melt flow characteristics, Thermal stability, Dimensional stability, Good appearance, and Good weather resistance

POLYURETHANE

Polyurethane has good elongation and high tensile strength. In addition, it offers excellent abrasion and tear strength plus good resistance to ozone and oxygen.

Low coefficient of friction makes polyurethane suitable for many other applications.

It can be produced in hardness ranging from 20 Shore A to 85 Shore D allowing it to be utilized for many different applications.

Polyurethane has significantly better impact resistance than structural plastics. It has load-bearing capacity for compression comparable to cast steel which is greater than natural rubber. Polyurethane also has high tensile strength.

Polyurethane is widely used in the automotive industry, railway industry, oil and gas pipelines, aviation industry and for agricultural machinery.

PPS

PPS (Polyphenylene sulfide) is semi crystalline with excellent chemical resistance. PPS has good dimensional stability.

The only lacking component of PPS is the mechanical properties. With low elongation, the

material can be brittle. Carbon fiber and other filled grades substantially improve the mechanical properties of this material. The chemical and thermal resistance of the material

makes it an excellent value in many semiconductor and medical applications.

PPS characteristics include: Good temperature resistance, Excellent dimensional stability,

Great chemical resistance, Non-flammability.

PVC

PVC

Vinyls are used mainly for their chemical and weathering resistance, high dielectric properties, or abrasion resistance.

Vinyl (Polyvinyl Chloride or PVC): In addition to its stable physical properties, PVC has excellent chemical resistance, good weatherability, flow characteristics and stable electrical properties. The diverse slate of vinyl products can be broadly divided into rigid and flexible materials. PVC film (PolyVinyl Chloride) can be produced with a range of characteristics and qualities from rigid PVC to semi-rigid PVC, to PVC film.

PVC Characteristics range from transparent film to matte finish.

POLYSULFONE

Polysulfone is a tough, rigid, high strength thermoplastic which maintains its properties over a wide temperature range. **Polysulfone** has very high dimensional stability. High rigidity and tensile impact coupled with excellent machinability are characteristics of Polysulfone. It is relatively ignition resistant and has good dielectric properties, but is susceptible to organic solvents and stress cracking.

TEA

TEA grades are ideal for coinjection or coextrusion over many other plastics. TEA'S demonstrate excellent adhesion on those plastics. The development of these alloys enables reliable performance in processing flexible or soft parts for perfect adherence to rigid parts.

The excellent adhesion of these alloys, combined with their compatibility for either insert or coinjection, has made them very attractive to major car manufacturers.

TEA grades feature Shore Hardness for 50 to 90 A. They provide from 500-2500 psi tensile strength and flexural modulus of 2000 - 35,000 psi.

TPE

Thermoplastic Elastomer is an extremely soft and flexible polymer claiming many of the same physical characteristics of rubber and yet benefiting from the processing advantages inherent in a thermoplastic polymer.