ENGINEERED MATERIALS
SOLUTIONS OVERVIEW
Celanese is a leading global supplier of high-performance engineering thermoplastics and thermoplastic elastomers for innovative applications.

"Today’s designers and engineers select engineered materials that allow their products to do it all – be smaller, lighter weight, more complex, stronger and more resilient, all while performing under a wide range of operating conditions – and get to market first.

Our team takes the time to understand customers’ operational, application and economic requirements and applies years of collective technical and engineering expertise in helping them select the right material solution to meet their needs today and for the future; that’s why customers see us as their first-choice chemistry solution source.”

— Todd Elliott
Senior Vice President of
Global Sales and Material Solutions
The phrase that best describes Celanese is the chemistry inside innovation, which represents our depth and breadth of knowledge, our desire to innovate and create, and our dedication to becoming your partner to help you succeed. With our industry expertise in engineered materials and commitment to collaboration, we can work together to help you bring the most innovative solutions to the marketplace.

Celanese has devoted decades of technical expertise in the art of material selection to cultivate our extensive product line of engineered materials. This allows our engineers the freedom to design and manufacture high-performing, attractive and practical components that expand upon the capabilities of existing products based on our customers’ requirements. Celanese will dedicate the time and resources necessary to understand your company’s operational, functional and financial requirements to select the material solution that will meet your current and future needs.

The Art of Material Selection

Whatever your product challenge, a Celanese polymer can help you overcome it through the art of material selection.

Our engineered materials are designed to help manufacturers reduce component weight, consolidate parts and meet tough specifications and regulations. In addition to reducing costs and facilitating environmental and safety compliance, our engineered materials provide the following solutions:

- Lightweight strength
- Dimensional stability
- Impact resistance
- Low friction and wear
- Excellent electrical properties
- Low moisture absorption
- Tough durability
- Chemical corrosion and temperature resistance
- UV stability
- Part consolidation
- Built-in aesthetics
- Increased operational efficiency
GLOBAL REACH AND OPERATIONS

Celanese maintains a global presence to meet the sales and manufacturing needs of customers around the world. By providing worldwide accessibility to our extensive product line of engineering materials, Celanese has the superior capability to provide innovative solutions to customers in a variety of industries, regardless of the size, scope or complexity of their requirements.

TECHNICAL SERVICE AND SUPPORT

Celanese offers a comprehensive technical service model that reflects our knowledge of the marketplace and enhances our customers’ capabilities to develop products that improve the world.

Over the past century, we’ve worked with our customers around the globe to assist them with our extensive technical service and support offerings in all phases of the development process.

**Capabilities**

1. Material Selection
2. Color Development
3. Field Technical Services
4. Technical Exchanges & Training Programs

**Design/CAE Services**

1. Filling Simulation
2. Static & Dynamic Simulation
3. Thermal Simulation

**Engineering**

1. Application Development
2. Application Processing and Prototyping

**Application Testing**

1. Application Testing Environments
2. Application Testing Services
Semi-Crystalline

POM (Polyoxymethylene)

For outstanding wear resistance, long-term fatigue resistance, toughness and creep resistance with excellent resistance to moisture, solvents and strong alkalis.

Applications
Hostaform® & Celcon® POM products are used extensively in a broad range of applications for the following industries:
- Automotive & Transportation
- Appliances & Consumer Goods
- Electrical & Electronics
- Industrial
- Healthcare

Hostaform® & Celcon® POM

Hostaform® and Celcon® POM are acetal copolymers that possess a linear structure with a highly crystalline quality that provides a variety of advantageous characteristics. The POM copolymer chemical structure provides a higher stability to thermal and oxidative degradation compared to acetal homopolymers. Both Hostaform® and Celcon® POM are utilized for their unique ability to sustain outstanding wear and long-term use, their toughness and creep resistance, and their excellent resistance to moisture, solvents and strong alkalis.

Product Properties for Hostaform® & Celcon® POM
- Very tough (down to -40°C)
- Very hard and rigid
- Easy colorization
- Good heat distortion temperature (up to 100°C)
- Very good slip & wear-resistance properties
- Excellent chemical resistance to fuels, solvents, strong alkalis
- Excellent wear resilience
- Low moisture absorption
- Resistant to stress cracking
- Improved low friction

Available Grades
- Easy flow
- Glass fiber/glass bead reinforced
- High impact resistance
- Low odor emission
- Suitability for food contact
- Chemical resistant
- Hot diesel resistant
- UV stabilized
- Electrically conductive
- Tribological
- Medical and Pharmaceutical Polymers (MT®)
- Appearance Polymers (MetaLX®)

Processing
- Injection molding
- Extrusion
- Rotational molding
- Physical foaming
- Gas and Water Injection Technology (GIT/WIT)

PBT (Polybutylene terephthalate)

For high strength, rigidity and toughness, low creep even at high temperatures and resistance to a wide range of chemicals and solvents.

Applications
The PBT thermoplastics produced by Celanese add significant value to the following industries:
- Automotive
- Appliances & Consumer Goods
- Electrical & Electronics
- Healthcare

Celanex® PBT

Celanex® PBT is a thermoplastic polyester that is especially suited as a sliding partner for Hostaform® & Celcon® POM. It features excellent dimensional stability, low moisture absorption and powerful insulation resistance. Numerous grades of Celanex® PBT hold regulatory approvals including VDE or UL approvals for the electrical and electronic market, and FDA approval for the nutrition and medical markets.

Product Properties for Celanex® PBT
- Very hard, rigid and strong
- Good creep resistance
- High heat-distortion temperature, especially for glass fiber-reinforced grades
- Service temperature to 140°C
- Very good low-friction and wear-resistant properties
- High dimensional stability (low thermal expansion coefficient, low water absorption)
- Good electrical properties
- Good chemical resistance
- No environmental stress cracking
- Good weathering resistance
- Rapid crystallization and fast cycle time
- Good heat distortion temperature, especially for glass fiber-reinforced grades
- Paintable

Available Grades
- Unreinforced
- Glass fiber/glass bead reinforced
- Mineral reinforced
- Glass fiber reinforced with very high surface gloss
- Low warpage
- UV stabilized
- Laser markable
- Hydrolysis and alkaline resistant
- Recyclable
- Gamma resistant
- Flame retardant
- Flame retardant (Halogen-free)
- Medical and Pharmaceutical Polymers (MT®)
- Appearance Polymers (MetaLX®)

Processing
- Injection molding
- Extrusion
- Meltblown
- Physical foaming
- Water and Gas Injection Technology (WIT/GIT)
**Pibifor® PBT**

Pibifor® PBT is a partially crystalline saturated polyester. Pibifor® PBT grants a high heat resistance, strength and hardness. It is distinguished by its excellent dimensional stability, low water absorption and high resistance to several chemicals. Pibifor® PBT can be co-molded with some special grades of the Laprene® SEBS-based thermoplastic elastomer.

**Product Properties for Pibifor® PBT**
- Excellent thermal insulation properties at high temperatures or high humidity
- Excellent chemical resistance
- Good thermal resistance
- Low humidity absorption

**Available Grades**
- Unreinforced
- Glass fiber/glass bead reinforced
- Flame retardant
- High impact modified
- Elastomer modified

**Processing**
- Injection molding

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**Vandar® PBT**

Vandar® PBT has high ductility and good stiffness with the excellent chemical and thermal resistance of polyester. Its alloys are easy to mold and retain their impact strength down to -30°C. Vandar® PBT products are available in unreinforced grades, as well as grades reinforced with glass fiber and glass beads or minerals. Glass fiber reinforced Vandar® PBT alloy grades provide added strength and toughness over a wide temperature range, from -40°C to 130°C.

**Product Properties for Vandar® PBT**
- High impact resistance and impact strength at low temperatures
- High heat-deflection temperature (service temperature to 120°C)
- High resistance to organic solvents, fuels, lubricants and brake fluids
- High abrasion resistance
- Good processability
- Paintable

**Available Grades**
- Unreinforced
- Glass fiber reinforced
- High impact modified
- Flame retardant

**Processing**
- Injection molding

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**Pibiter® PBT**

Pibiter® PBT includes a range of products which present high mechanical and electrical characteristics and excellent performance at high temperatures. The combination of mechanical, thermal and electrical properties together and their unique resistance to flames and chemicals place Pibiter® PBT in the most interesting class of thermoplastics for applications in the engineering sector. Pibiter® PBT can be co-molded with some special grades of the Laprene® SEBS-based thermoplastic elastomer.

**Product Properties for Pibiter® PBT**
- Excellent thermal insulation properties at high temperatures
- Excellent chemical resistance
- Good thermal resistance
- Low humidity absorption

**Available Grades**
- Unreinforced
- Glass fiber reinforced
- Flame retardant
- High impact modified
- Elastomer modified

**Processing**
- Injection molding

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**PET (Polyethylene terephthalate)**

For outstanding physical properties and superior thermal and chemical resistance, with the ability to support higher temperature exposure.

**Impet® PET**

Glass-reinforced Impet® polyester products are outstanding candidates for high-performance applications calling for strength, rigidity, dimensional stability, toughness and excellent electrical properties. Custom-modified Impet® PET resins are also available where needed to meet the specific requirements of certain packaging and film applications.

**Product Properties for Impet® PET**
- Very hard, rigid and strong
- Very good creep strength
- Paintable surface
- High heat distortion temperature (up to 228°C)
- Service temperature to 150°C
- Good low friction and wear resistant properties
- Very good electrical properties
- Good dielectric properties
- High chemical resistance
- High weathering resistance

**Available Grades**
- Glass fiber reinforced
- Special color formulations
- Recyclable

**Processing**
- Injection molding

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**Applications**

Celanese Impet® PET products add significant value to the following industries:
- Automotive & Transportation
- Electrical & Electronics
- Industrial
- Packaging & Film

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**PET**

For outstanding physical properties and superior thermal and chemical resistance, with the ability to support higher temperature exposure.

**Applications**

Celanese Impet® PET products add significant value to the following industries:
- Automotive & Transportation
- Electrical & Electronics
- Industrial
- Packaging & Film

**Impet® PET**

Glass-reinforced Impet® polyester products are outstanding candidates for high-performance applications calling for strength, rigidity, dimensional stability, toughness and excellent electrical properties. Custom-modified Impet® PET resins are also available where needed to meet the specific requirements of certain packaging and film applications.

**Product Properties for Impet® PET**
- Very hard, rigid and strong
- Very good creep strength
- Paintable surface
- High heat distortion temperature (up to 228°C)
- Service temperature to 150°C
- Good low friction and wear resistant properties
- Very good electrical properties
- Good dielectric properties
- High chemical resistance
- High weathering resistance

**Available Grades**
- Glass fiber reinforced
- Special color formulations
- Recyclable

**Processing**
- Injection molding
**LCP (Liquid crystal polymer)**

For stable dimensions and high-temperature performance in thin-walled applications.

**Vectra® & Zenite® LCP**

Vectra® and Zenite® LCP are part of a family of halogen-free, high-performance liquid crystal polymers with exceptionally precise and stable dimensions. These highly crystalline, thermotropic (melt-orienting) thermoplastics are distinguished from other semi-crystalline plastics by their special molecular structure, which consists of rigid, rod-like macromolecules that form liquid crystal structures in the melt phase.

**Applications**

Celanese Vectra® & Zenite® LCP products add significant value to the following industries:
- Automotive & Transportation
- Appliances & Consumer Goods
- Electrical & Electronics
- Healthcare

**Product Properties for Vectra® & Zenite® LCP**

- Continuous service temperatures up to 240°C
- Short-term service temperatures up to 340°C
- Very low melt viscosity
- Very low water absorption
- Very low heat of fusion allowing for short cycle times
- Very low coefficient of linear thermal expansion
- Very high tensile strength and elastic modulus in the flow direction
- Inherently flame-resistant (UL 94 V-0, some grades with 5 VA)
- Halogen free without additives
- Very good chemical and oxidation resistance
- FDA compliant (BPA- & PTFE-free)

**PA (Polyamide)**

For outstanding resistance to high temperature, excellent surface quality, high dimensional stability, and high performance across environmental conditions.

**Applications**

The PA6, PA66, PPA and semi-aromatic PA thermoplastics produced by Celanese add significant value to the following industries:
- Electrical & Electronics
- Household Goods & Appliances
- Automotive
- Sports & Leisure Industry
- Machine Tools Industry
- Safety Equipment
- Construction Equipment and Water Management

**PA66 & PA6**

**Frianyl® polymer**

Our FRIANYL® flame retardant PA6 and PA66 compounds meet stringent industry requirements with multiple grades UL Listed and certified by VDE.

**Product Properties for Frianyl® polymer PA**

- Multiple flame technologies available:
  - Halogen and red phosphorous-free reinforced and unreinforced
  - Red phosphorous glass fiber reinforced
  - Halogenated, reinforced and unreinforced
  - Halogenated, antimony trioxide free
- Compounds are rated at maximum safety level according to international and national railway regulations
- Wide range of colors
- More than 80 grades are UL listed or certified by VDE
- Products rated at maximum safety level according to international and national railways norms

**Available Grades**

- Halogen and red phosphorous free:
  - Glass fiber reinforced up to 35%
  - Unfilled V0 and V2 compounds
  - Glass fiber reinforced V2 compounds
  - Red phosphorous: up to 55% glass fiber reinforced
  - Halogen: from unfilled up to 30% glass fiber or mineral filled

**Processing**

- Injection molding
**Nilamid® polymer**
Nilamid® technical and specialty PA6 and PA66 compounds provide a broad range of solutions for industrial & consumer and automotive applications. In addition, our Nilamid® compounds can address multiple thermal, mechanical, electrical and tribological requirements.

### Product Properties for Nilamid® polymer Technical Compounds
- Excellent stiffness and tensile strength
- Very low warpage
- Very good creep resistance
- Excellent surface quality
- High dimensional stability
- Wide range of colors

### Product Properties for Nilamid® polymer Specialty Compounds
- Tribological products for low wear and friction
- Electrically conductive and dissipative
- Cross linkable
- Effective alternative to metal
- High mechanical strength
- Water and food contact compliancy

#### Available Grades
- Tribological with PTFE, silicon, graphite, molybdenum disulfide; unreinforced and reinforced with glass, carbon and aramid fibers; lubricated flame retardant compounds
- Glass fiber reinforced up to 60%
- Metal and carbon fibers reinforced
- High mechanical performance for metal replacement
- Mineral and/or glass bead-filled
- Unfilled, unreinforced and fiber reinforced
- Heat stabilized
- Hydrolysis resistant

#### Processing
- Injection molding

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**Nylfor A® & Nylfor B®**
Nylfor A® PA66 and Nylfor B® PA6 are aliphatic polyamides obtained through the polymerization of adipic acid and hexamethylenediamine. Their chain chemical structures ensure high impact resistance and excellent mechanical properties of the material. The Nylfor® product family features a wide range of materials, such as fiberglass reinforced, elastomer modified, heat-stabilized, mineral filled and flame-retarded (UL94-V0). Tailor-made formulations can also be developed to meet specific market needs.

### Product Properties for Nylfor A® PA66 & Nylfor B® PA6
- Excellent mechanical properties (modulus and load)
- High impact resistance
- Excellent resistance to organic solvents
- High wear and fatigue resistance even at high temperatures
- Easy processability and molding

#### Available Grades
- Glass fiber reinforced
- Elastomer modified
- Mineral filled
- Lubricated
- Wide range of colors
- Wide range of viscosity

#### Processing
- Injection molding

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**Nivionplast A® polymer and Nivionplast B® polymer**
Nivionplast® is a thermoplastic polymer with a partially crystalline structure presenting an excellent balance of properties combined with good processing properties. These qualities make the Nivionplast® polyamides suitable for use in many industrial sectors. Nivionplast A® can be co-molded with some special grades of the Laprene® range (SEBS-based thermoplastic elastomer).

### Product Properties for Nivionplast A® polymer PA66 & Nivionplast B® polymer PA6
- Good mechanical resistance
- High rigidity
- High impact resistance
- Excellent dimensional stability
- High fatigue resistance
- High thermal properties

#### Available Grades
- Glass fiber/glass bead reinforced
- Elastomer modified
- Mineral filled
- Lubricated
- Wide range of colors
- High impact modified

#### Processing
- Injection molding

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**ECOMID® PA & ECOMID® ARX**
Our ECOMID® and ECOMID® ARX recycled PA66 compounds contain high-quality, recycled polyamide fibers and textiles and offer an environmentally-friendly alternative to standard grades. These compounds, given their sourcing and manufacturing process, provide high lot-to-lot consistency to customers.

### Product Properties for ECOMID® & ECOMID® ARX
- Long-term thermal performances
- High stiffness
- Thermal and creep resistance
- Very good processability
- High performance with up to 100% recycle
- Some grades are UL Listed

#### Available Grades
- Glass fiber reinforced
- Impact modified
- Heat stabilized
- Mineral filled

#### Processing
- Injection molding

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**Nylfor® R6 and Nylfor® R66**
Our Nylfor® R6 and Nylfor® R66 polyamide compounds obtained from recycling of textile waste for the automotive industry.

### Product Properties for Nylfor® R6 and Nylfor® R66
- Very good processability
- High resistance to organic solvents
- Good resistance to wear and fatigue at high temperatures
- Good mechanical properties
- Compliant with RoHS norms

#### Available Grades
- Glass fiber reinforced
- Impact modified
- Heat stabilized
- Mineral filled

#### Processing
- Injection molding

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*Only available in Europe*
PPA (semi-crystalline polyphthalamide)

**FRIANYL® polymer XT**
Our FRIANYL® XT flame retardant PPA compounds for the electrical & electronics, lighting, industrial and automotive industries.

**Product Properties for FRIANYL® polymer XT**
- Maximum service temperature significantly higher than polyamide 6.6
- V0 rating at 0.4 mm according to the UL 94 flammability standard
- High short-term temperature resistance
- High stiffness and strength at elevated temperatures
- High dimensional stability
- Excellent creep resistance
- Resistance to chemicals and hydrolysis

**Available Grades**
- Halogen and red phosphorous free
- With halogen

**Processing**
- Injection molding

**Nilamid® polymer XT**
Our Nilamid® XT PPA compounds for the automotive and industrial industries.

**Product Properties for Nilamid® XT polymer**
- Superior resistance to high temperatures
- Excellent mechanical properties
- High stiffness and strength at elevated temperatures
- High dimensional stability
- Excellent creep resistance
- Resistance to chemicals and hydrolysis

**PARTIALLY AROMATIC PA**

**Nilamid® polymer XS**
Our partially aromatic PA compounds for the sport & leisure, furniture and automotive industries.

**Product Properties for Nilamid® polymer XS**
- Developed as alternative to metal
- High stiffness and strength
- Low warpage
- Good creep resistance
- Excellent surface finish
- High dimensional stability
- Performance independent from environmental conditions

**Available Grades**
- Glass fiber reinforced up to 65%
- Impact modified
- Mineral filled
- Specialty type such as carbon fiber reinforced and low wear and friction

**Processing**
- Injection molding

**PCT**
(Polycyclohexylene-dimethylene terephthalate)

For superior performance and value through improved heat resistance, fast molding cycles and excellent processability.

**Applications**
Celanese Thermx® PCT products are ideal for a wide range of injection molded components for the following industries:
- Automotive & Transportation
- Appliances & Consumer Goods
- Electrical & Electronics

**Thermx® PCT**
Thermx® PCT offers the desirable chemical resistance, processability and dimensional stability of engineering polyesters similar to PET and PBT. However, the added benefits of heat resistance make Thermx® PCT particularly well-suited for demanding automotive and electrical applications.

**Product Properties for Thermx® PCT**
- Short-term temperature resistance up to 255°C
- Chemical resistance
- Low moisture absorption
- Low-flash processing
- High CTI and arc resistance
- High whiteness and color stability

**Available Grades**
- Glass fiber reinforced
- Mineral reinforced
- Flame retardant

**Processing**
- Injection molding
PEEK (Polyetheretherketone)

For superior heat resistance and operational qualities that continue to benefit from our high-flow knowledge and expertise in injection molding.

Applications
Celapex™ PEEK is an ideal candidate for a wide range of injection molded components for the following industries:
• Automotive & Transportation
• Electrical & Electronics
• Industrial
• Energy Management

Celapex™ PEEK

Celapex™ PEEK is a high-flow solution that accelerates the filling of intricate complex geometry molds, resulting in thin-wall, long-flow parts with high precision and tight tolerances. Celanese developed a proprietary technology to improve PEEK melt flow to reduce the risk of warpage and ensure that complicated parts, such as connectors, are easier to mold. Celapex™ PEEK continues to improve molding productivity and reduce part costs for our customers.

Product Properties for Celapex™ PEEK
• Excellent chemical resistance even at high temperatures
• Strong resistance to the organic and aqueous environments and to solvents
• Very resistant to the thermal degradation
• Excellent mechanical properties at high temperatures
• High surface quality
• Molding of thin wall intricate parts and long flow length components
• Ease of processing even at high filler loading
• Molding at lower injection & lower melt temperature
• Part making productivity at lower conversion cost
• Low warpage in tight-tolerance, high precision parts
• Complete filling of thick parts free of voids or porosity

Available Grades
• Unfilled
• Glass fiber reinforced

Processing
• Injection molding

PP Compounds (Polypropylene)

For lighter engineering plastics suitable for applications that facilitate weight reduction.

Applications
Celanese has a number of ideal polypropylene (PP) products to meet your specific needs. We currently utilize these product solutions to add value to the following industries:
• Automotive & Transportation
• Household Goods & Appliances
• Electrical & Electronics

Polifor® PP

Polifor® PP represents a wide range of polypropylene compounds manufactured and marketed by Celanese. Polypropylene is the third most widely used thermoplastic polymer at a global level, and our range of Polifor® PP products includes both polypropylene homopolymer and copolymer compounds that can be extensively modified to meet our customers’ needs.

Product Properties for Polifor® PP
• High stiffness and abrasion resistance
• Low specific gravity
• High impact and fatigue resistance
• Excellent resistance to chemical agents
• Low hygroscopic sensitivity
• Easy processability
• Fully recyclable
• Wide range of fillers, reinforcing agents and additives.

Available Grades
• Glass fiber reinforced
• Mineral filled
• Electrically conductive
• Elastomer modified
• Flame retardant
• Flame retardant (Halogen-free)

Processing
• Injection molding
• Extrusion

Tecnoprene® PP

Tecnoprene® PP is reinforced with chemically-bonded glass fiber and is utilized for applications requiring high rigidity and strong mechanical resistance at high temperatures. The chemical bond between polypropylene and glass fiber guarantees a high impact resistance, improved mechanical properties and better performances under tensile strength. The high thermal performances and considerable impact resistance in different operating conditions make Tecnoprene® PP especially suitable for various technical applications. Tecnoprene® PP is capable of co-molding with other Celanese products, including Forprene® TPV, Laprene® SEBS and Sofprene T® SBS.

Product Properties for Tecnoprene® PP
• High impact resistance
• High fluidity
• Chemical resistant
• Suitable for contact with food and potable water
• Excellent mechanical properties
• Strong performance under tensile strength

Available Grades
• Glass fiber reinforced
• Mineral filled
• High crystallinity
• Elastomer modified
• Aesthetic grades
• Suitable for food contact
• Flame retardant
• Flame retardant (Halogen-free)

Processing
• Injection molding
• Extrusion
• Blow molding
• Rotational molding
Carboprene® PP
Carboprene® PP are polypropylene-based homopolymers or copolymers filled with calcium carbonate. These products have been designed for technical applications operating at different thermal conditions. These materials are characterized by high dimensional stability coupled with strong mechanical properties and aesthetic appeal.

Product Properties for Carboprene® PP
- High dimensional stability
- Good aesthetic properties
- Strong mechanical properties

Available Grades
- Mineral filled (Calcium carbonate filled up to 40%)
- High impact resistance
- UV & detergent stabilization (available upon request)

Processing
- Injection molding

Talcoprene® PP
Talcoprene® PP are polypropylene-based homopolymers or copolymers filled with talc. These products have been developed for technical applications operating at different thermal conditions. These materials are characterized by high dimensional stability coupled with strong mechanical properties and aesthetic appeal.

Product Properties for Talcoprene® PP
- High dimensional stability
- Good aesthetic properties & wide range of colors
- Strong mechanical properties
- High density
- Wide range of colors
- Thermal aging & resistance

Available Grades
- Mineral filled
- Elastomer modified
- Flame retardant
- High impact modified
- UV & detergent stabilization

Processing
- Injection molding
- Extrusion

Fortron® PPS
Fortron® PPS is an ideal candidate for a wide range of injection molded components for the following industries:
- Automotive & Transportation
- Electrical & Electronics
- Appliances & Consumer Goods
- Films & Composites

Product Properties for Fortron® PPS
Unreinforced Fortron® PPS has comparably low heat resistance - but adding glass fibers and mineral mixtures allow characteristics like:
- Service temperatures up to +240°C
- Very good resistance to chemicals and solvents
- Very hard and rigid
- Very low moisture absorption
- Flame resistance (UL 94 V-0, some grades SVA)
- Suitable for lead-free soldering
- Excellent creep resistance at elevated temperatures

Available Grades
- Glass fiber reinforced
- Mineral reinforced
- Flame retardant (V-0 UL94B)
- ISO 10993 and USP Class VI compliant
- Drug (DMF 14844) and Device (MAF-1097) Master Files available
- European Directive 2002/72/EC compliant

Processing
- Injection molding
- Extrusion
- Blow molding

PPS (Polyphenylene sulfide)
For high temperature stability, broad chemical resistance, stiffness, strength and creep resistance at elevated temperatures.

Applications
Fortron® PPS is an ideal candidate for a wide range of injection molded components for the following industries:
- Automotive & Transportation
- Electrical & Electronics
- Appliances & Consumer Goods
- Films & Composites

Product Properties for Fortron® PPS
Unreinforced Fortron® PPS has comparably low heat resistance - but adding glass fibers and mineral mixtures allow characteristics like:
- Service temperatures up to +240°C
- Very good resistance to chemicals and solvents
- Very hard and rigid
- Very low moisture absorption
- Flame resistance (UL 94 V-0, some grades SVA)
- Suitable for lead-free soldering
- Excellent creep resistance at elevated temperatures

Available Grades
- Glass fiber reinforced
- Mineral reinforced
- Flame retardant (V-0 UL94B)
- ISO 10993 and USP Class VI compliant
- Drug (DMF 14844) and Device (MAF-1097) Master Files available
- European Directive 2002/72/EC compliant

Processing
- Injection molding
- Extrusion
- Blow molding
UHMW-PE
(Ultra-high molecular weight polyethylene)
For outstanding abrasion resistance, superior impact resistance, non-sticking and self-lubricating properties.

GUR® UHMW-PE
GUR® UHMW-PE is a linear polyethylene with a much higher polymerization than standard PE grades, which offers outstanding abrasion resistance, superior impact resistance, non-sticking and self-lubricating properties. GUR® UHMW-PE has excellent mechanical characteristics, even in cryogenic conditions. GUR® UHMW-PE standard and premium grades meet the requirements of health organizations, such as the U.S. Food and Drug Administration (FDA) and European Union regulation (EC) No. 1935/2004 regarding food contact materials.

Applications
GUR® UHMW-PE is an ideal candidate for a wide range of applications benefitting from its high molecular weight in the following industries:
• Electrical & Electronics
• Appliances & Consumer Goods
• Healthcare
• Industrial
• Energy Management

Product Properties
• Exceptionally high impact strength
• High energy absorption capacity at high stress rate
• Excellent low-friction and wear-resistant properties
• Very high chemical resistance to acids, alkalis and corrosive gases
• Highly resistant to environmental stress cracking
• Very good acoustic damping properties
• Wide service temperature range from -200°C to +90°C

EVA
(Ethylene vinyl acetate)
For an extremely elastic material that can be sintered to form a porous material similar to rubber, yet with excellent toughness.

Ateva® EVA
Celanese manufactures a full line of high-performance Ateva® EVA copolymers containing up to 40% vinyl acetate. Ateva® EVA copolymers have a broad melt index range and are recognized around the world for their quality and versatility.

Applications:
• Automotive & Transportation
• Electrical & Electronics
• Healthcare
• Energy Management

Product Properties for Ateva® EVA & Ateva® Extrubond™ EVA
• Broad melt index
• Controlled-release applications
• State-of-the-art manufacturing to introduce specialized products
• Excellent adhesion to substrates
• Increased line speeds: Greater utilization of existing equipment & machinery
• Reduced airgaps for improved neck-in
• Excellent flexibility
• Excellent weldability
• Good transparency
• High impact resistance
• Excellent low-temperature properties

Available Grades
• Glass fiber reinforced
• Carbon fiber reinforced
• Fiber & filler modified
• Electroplated & electrically conductive
• Medical and Pharmaceutical Polymers (MT®)

Processing
• Injection molding
• Extrusion
SBS
(Styrene butadiene styrene)

For cost-effectiveness and easy processability allowing the production of rubber-like materials and minimizing the length of the curing process.

Applications
Sofprene® T SBS is an ideal candidate for a wide range of applications benefitting from its high molecular weight in the following industries:
- Household Appliances & Consumer Goods
- Industrial

Sofprene® T SBS

Sofprene® T SBS is a thermoplastic elastomer which is easily and inexpensively processed and fully recyclable. Its elastomeric phase features typically rubber-like specifications, such as excellent elastic recovery and softness. Sofprene® T SBS can successfully preserve such characteristics even at very low temperatures (-50°C).

Product Properties
- Wide hardness range from 25 ShA to 40 ShD scale
- Density from 0.9 g/cm³ to 1.25 g/cm³
- Operating temperature from -50 °C to +60 °C
- High elastic recovery both at low and room temperature
- Excellent resistance to several chemical agents
- High thermal and electric insulation values
- Good abrasion resistance
- Specific rheology for each type of process
- Excellent colorability
- Good adhesion to polystyrene and other polymers

Processing
- Injection molding
- Extrusion

Available Grades
- High transparency
- Suitability for food contact
- UV and heat resistant
- Varying grades of shore hardness (ShA/SHD)

SEBS
(Styrene ethylene butylene styrene)

For an easy, inexpensive way to utilize thermoplastic materials that are fully recyclable with rubber-like qualities.

Applications:
- Automotive & Transportation
- Electrical & Electronics
- Healthcare
- Energy Management

Laprene® SEBS

Laprene® SEBS is a family of thermoplastic elastomers in which the elastic phase is made up of rubber. The plastic phase allows Laprene® SEBS to be processed in an easy, inexpensive way by means of the traditional technologies used for thermoplastic materials and to be fully recyclable. The elastomeric phase features typically rubber-like specifications, such as elastic recovery and softness.

Product Properties for Laprene® SEBS
- High fatigue resistance
- Excellent resistance to chemical agents
- Specific rheology for each type of process
- High thermal and electric insulation values
- Wide hardness range from 2 ShA to 60 ShD
- Operating temperature ranging from -50 to +120°C
- Excellent resistance to UV-aging, ozone and weathering
- Density ranging from 0.90 g/cm³ to 1.20 g/cm³
- Wide range of colors and aesthetic properties
- High elastic recovery within a wide temperature range
- Improved temperature resistance up to 120°C and over

Processing
- Injection molding
- Extrusion
- Blow molding
- Calendering
- Thermoforming

Available Grades
- Grades with very high fluidity
- Translucent and transparent grades
- Grades for adhesion on polar polymers
- Suitability for food contact
- Varying grades of shore hardness (ShA/SHD)
TPC-ET
(Thermoplastic polyester elastomers)
For easier reversible processing, high customizability and better heat and solvent resistance than ordinary rubbers.

Applications
- Automotive & Transportation
- Appliance & Consumer Goods
- Electrical & Electronics
- Industrial

Riteflex® & Pibiflex® TPC-ET
Riteflex® & Pibiflex® TPC-ET are thermoplastic elastomers that combine the favorable characteristics of vulcanized rubber with the easy processability of thermoplastics for toughness, tear and flex fatigue resistance over a wide temperature range. Certain grades of Pibiflex® TPC-ET utilize innovative Dolphin technology that enables the production of soft-touch dashboard and interior panels in a single phase. Dolphin grades of Pibiflex® TPC-ET benefit our customers by streamlining logistics, reducing costs and decreasing the length of production cycles.

Product Properties for Riteflex® & Pibiflex® TPC-ET
- Performs over a temperature range of -60°C to +121°C
- Very flexible with high-impact strength even at low temperatures
- High mechanical strength
- Good resilience
- Highly resistant to chemicals and aging
- Excellent surface gloss and good paintability
- Easy and economical to process
- Excellent wear resistance
- No softening additives are required
- Capability to bond hard segments with soft segments
- Facilitates compliance with hazardous substance materials

Available Grades
- Varying grades of shore hardness (ShD)
- Heat stabilized
- Glass fiber reinforced
- Carbon black concentrate
- UV concentrate for improved weather stability
- XFR® Flame retardant
- XFR® Halogen and antimony-free system
- Medical and Pharmaceutical Polymers (MT®)
- Appearance Polymers (MetaLX®)
- Dolphin grades for soft-touch interior trims
- Suitability for food contact

Processing
- Injection molding
- Extrusion

TPO
(Thermoplastic olefin)
For improved weather resistance, excellent electrical insulation and elastic properties at low temperatures.

Applications
- Automotive & Transportation
- Building & Construction
- Sports & Leisure

Forflex® TPO
Forflex® thermoplastic elastomers consist of heterophased compounds based on an amorphous elastomeric phase and a crystalline phase. This chemical composition confers elastic properties to finished products up to temperatures of 70°C to 80°C, while it fluidifies the mass at higher temperatures, giving it rheological properties like other thermoplastic elastomers.

Product Properties for Forflex® TPO
- Good weather resistance
- Excellent electrical insulation properties
- Low density (from 0.89 g/cm³)
- Excellent elastic properties at low temperatures
- Excellent colorability
- Suitable for food contact

Available Grades
- Suitability for food contact
- Varying grades of shore hardness (ShA/ShD)
- Compliant with Regulation (EC) No. 1907/2006 (REACH)

Processing
- Injection molding
- Extrusion
TPU
(Thermoplastic polyurethane)

For elastomer-modified polyurethane plastics with superior elasticity, transparency and resistance to oil, grease and abrasion.

Applications
Celanese utilizes Sofpur® TPU for a wide range of injection molded components for the following industries:
- Household & Consumer Goods
- Footwear
- Sports & Leisure

Sofpur® TPU
Sofpur® TPU is an elastomer-modified thermoplastic polyurethane (TPU) mainly utilized by the footwear industry. Sofpur® TPU products combine the excellent mechanical characteristics of polyurethane – particularly an excellent abrasion resistance – with the processing ease typical of all thermoplastic elastomers. Sofpur® can also be easily transformed with the same machines used for the injection molding of thermoplastic rubber.

Product Properties for Sofpur®
- Good processability with traditional TPR machines
- Available in hardness that ranges from 60 ShA to 80 ShA
- Lightness (10% less weight than standard TPU)
- Excellent abrasion resistance
- High elastic recovery at low temperatures
- Compatible with bi-component polyurethane
- Possibility of direct injection molding on leather and hide
- Excellent colorability & wide range of colors
- Excellent aesthetical properties

Available Grades
- Enhanced aesthetical and mechanical properties
- Superior transparency in certain grades
- Varying grades of shore hardness (ShD)
- Extra light grades

Processing
- Injection molding

TPV
(Thermoplastic vulcanite)

For easy, inexpensive processing, full recyclability of all products, and rubber-like specifications, such as recoverability and softness.

Applications
Celanese utilizes Forprene® TPV for a wide range of injection molded components for the following industries:
- Automotive & Transportation
- Electrical & Electronics
- Household Appliances & Consumer Goods
- Industrial

Forprene® TPV
Forprene® is a Thermoplastic Elastomer (TPE) and more precisely it is a Vulcanised Thermoplastic Elastomer (TPV).

It is made of an elastomeric phase (dynamically vulcanized EPDM) which is deeply dispersed in a polyolefinic thermoplastic matrix, whose combination determines a real plasto-elastomeric alloy characterized by high performances and extremely easy processability.

The thermoplastic matrix allows Forprene® to be processed in an easy, inexpensive way by means of traditional technologies used for thermoplastic materials, and to be fully recyclable, while its elastomeric phase features typically rubber-like specifications, such as elastic recovery and softness.

Product Properties
- Wide hardness range from 20 ShA to 60 ShD
- Service temperature ranging from -40°C to 130°C
- Typical density <1 g/cm³
- High elastic recovery within a wide temperature range
- Excellent resistance to UV rays and weathering
- Excellent resistance to chemical agents
- High fatigue resistance
- High thermal and electric insulation values
- Good abrasion resistance
- Specific rheology for each type of process

Grades
- Flame retardant
- UV and heat resistant
- Protection against copper
- Low fogging value
- Low friction coefficient
- High abrasion resistance
- Wide variety of colors

Processing
- Injection molding
- Extrusion
- Blow molding
- Calendering
- Thermoforming
ABS
(Acrylonitrile butadiene styrene)

For cost-effective solutions distinguished by their superior hardness, gloss, toughness and electrical insulation properties.

Applications
Celanese customers utilize our ABS products for applications in the following industries:
- Household Appliances & Consumer Goods
- Sports & Leisure
- Electrical & Electronics

Abistir® & Retelan® ABS

The range of Abistir® & Retelan® ABS products include filled, reinforced and flame retardant materials, as well as other specially modified compounded materials enriched with additives. Abistir® ABS can be co-molded with some special grades of Laprene® SBS, a thermoplastic elastomer also within the Celanese product family of engineered materials.

Product Properties for Abistir® & Retelan® ABS
- Excellent dimensional stability
- Excellent aesthetical properties
- Good impact resistance
- Processing ease
- High gloss
- Good electrical properties, not influenced by thermal shock and humidity absorption
- Easy painting

Available Grades
- Unfilled grades
- Glass fiber/glass bead reinforced
- Flame retardants

Processing
- Injection molding
- Extrusion

HI-PS
(High-impact polystyrene)

For low-cost, tough plastics that are easy to thermoform and fabricate.

Applications
Celanese customers utilize our ABS products for applications in the following industries:
- Appliances & Consumer Goods
- Electrical & Electronics
- Sports & Leisure

Stirofor® HI-PS

The range of Stirofor® HI-PS compounds by Celanese include flame retardant materials (UL 94 V2 and V0) and is available in a large range of colors.

Product Properties for Stirofor® HI-PS
- Excellent dimensional stability
- Excellent aesthetical properties
- Good impact resistance
- Superior processability
- Excellent protection against copper
- Low fogging value
- Low friction coefficient
- High abrasion resistance

Available Grades
- Flame retardant
- Heat and UV-resistant
- RAL-GZ 716/1 approval, Class IV (building industry)

Processing
- Injection molding
- Extrusion
PC (Polycarbonate)
For strong, tough materials that are easily molded and thermoformed, including some grades that are optically transparent.

Applications
Celanese customers utilize our PC products for applications in the following industries:
- Household Appliances & Consumer Goods
- Electrical & Electronics
- Sports & Leisure

Carbofor® PC
The range of Carbofor® PC compounds manufactured by Celanese includes reinforced and flame retardant materials (UL94 V0). These products are available in many viscosity grades and in a wide choice of colors.

Product Properties for Carbofor® PC
- Excellent dimensional stability
- Excellent transparency and aesthetical properties
- Excellent impact resistance

Available Grades
- Flame retardant
- UV-ray and heat resistant
- Protection against copper
- Low fogging value
- Low friction coefficient
- High abrasion resistance
- RAL-GZ 716/1 approval, Class IV (building industry)

Processing
- Injection molding
- Extrusion

PC/ABS (Polycarbonate/Acrylonitrile butadiene styrene)
For a unique combination resulting in compounds with high processability, excellent mechanical properties and superior impact and heat resistance.

Applications
Celanese customers utilize our PC/ABS products for applications in the following industries:
- Automotive & Transportation
- Households Appliances & Consumer Goods
- Electrical & Electronics

Blendfor® & Reblend® PC/ABS
Blendfor® & Reblend® PC/ABS consist of resins that are specifically blended for applications that require a high heat distortion temperature and good toughness. They also maintain their toughness and high impact resistance in low temperatures, making them suitable for applications used in a broad range of climates.

Product Properties for Blendfor® & Reblend® PC/ABS
- High impact strength even at low temperatures
- Excellent dimensional stability
- Excellent aethetical properties
- Excellent impact resistance
- Good thermal properties
- Easy to paint

Available Grades
- Unfilled
- Glass fiber reinforced
- Flame retardant

Processing
- Injection molding

PPE (Polyphenyl ether)
For excellent mechanical properties even at high temperatures and availability in a wide range of colors.

Applications
Celanese customers utilize our Norfor® PPE products for applications in the following industries:
- Automotive & Transportation
- Appliances & Consumer Goods

Norfor® PPE
Norfor® PPE is the trade name of the Polyphenylene Oxide Compound (PPO) manufactured by Celanese, including reinforced and flame retardant materials (UL94 V0). Norfor® is available in a wide variety of colors.

Product Properties for Norfor® PPE
- Excellent dimensional stability
- Excellent temperature resistance
- Excellent mechanical properties even at high temperatures

Available Grades
- Unfilled
- Glass fiber reinforced
- Flame retardant

Processing
- Injection molding

SAN (Styrene acrylonitrile)
For optically transparent plastics with superior thermal and strong mechanical properties and chemical resistance.

Applications
Celanese customers utilize our Sanfor® SAN products for applications in the following industries:
- Automotive & Transportation
- Appliances & Consumer Goods

Sanfor® SAN
Celanese Sanfor® SAN products include reinforced materials and are available in a wide variety of colors.

Product Properties for Sanfor® SAN
- Excellent dimensional stability
- Excellent transparency
- Excellent aethetical properties
- High impact resistance
- Good chemical and thermal resistance

Available Grades
- Glass fiber reinforced

Processing
- Injection molding
LFRT
(Long fiber reinforced thermoplastic)
For excellent mechanical properties, impact and creep resistance and low warpage for metal replacement applications.

Applications
Our Celanese LFRT products add significant value to the following industries:
- Automotive & Transportation
- Electrical & Electronics
- Industrial
- Sports & Leisure
Celstran® and Compel® LFRT products are produced in a special patented pultrusion process that achieves a high impregnation quality without damage to the fibers. Incorporated fibers can be glass, carbon, aramid and stainless steels. As matrix materials, nearly all types of polymers are suitable.

Celstran® LFRT
Using Celstran® LFRT allows cost-saving production methods and short cycle times in component manufacturing, resulting in products with high price and performance ratios. Celstran® LFRT also provides added benefits to the environment, since products within this line are also recyclable because of their high fiber lengths.

Compel® LFRT
Compel® LFRT is known for the mechanical properties that make products within this family excellent solutions for metal replacements like automobile front ends and control panels. Products with longer fiber reinforcements suitable for extrusion compression molding are available as Compel® LFRT with fiber lengths of approximately 25 mm.

TCP
(Thermally conductive plastics)
For thermal conductivity in a plastic that provides the ability to meet demanding engineering requirements in many applications more cost effectively than other materials including metals, ceramics and other plastics.

CoolPoly® TCP
CoolPoly® thermally conductive plastics are engineered materials. They are formulated compounds using commodity, engineering and high-performance grade thermoplastic resins. Various additives and ingredients are compounded to impart thermal conductivity and other desirable attributes.

Product Properties for CoolPoly® TCPs
- Weight reduction
- Avoid metal manufacture and machining
- Inherent corrosion resistance
- Part consolidation opportunities
- Improve safety
- Increase reliability
- Reduce amplification of electrical interference
- Extended part and component life [reduced device temperature]
- Enable flexibility in material choice
- Efficient heating and cooling
- Eliminate need for active cooling
- High throughput injection molding
- Manufacture of complex shapes and geometries
- Rapid prototyping and evaluation

Processing
- Injection molding
Lightweight Composite Polymers

For lightweight solutions that enhance produce with excellent dimensional stability and versatility.

Litepol® PP/HB

Litepol® PP/HB compounds are used to produce extra light engineering plastics suitable for applications in which weight reduction is the primary objective. Our Celanese Litepol® PP/HB compounds are comprised of polypropylene polymers filled with hollow glass microspheres. They have added significant value to customers in the automotive industry by facilitating compliance with strict regulations and targets in terms of emissions.

Product Properties for Litepol® PP/HB

- High impact resistance
- Low Density (Less than 1/5 of mineral fillers)
- Reduced cooling times
- Excellent dimensional stability of molded parts
- Excellent versatility and customization potential
- Low acoustic transmittance, for a sound deadening effect
- Low thermal conductivity to facilitate faster cooling times
- Weight reduction from -9% to -30%
- Stiffness from +13% to +17%
- Mixed HB/GF grades, an impact from +20% to +218%
- Reduction of cycle times from 8% to 37%

Processing

- Injection molding
- Additional processing conditions available depending on product formulation

Medical and Pharmaceutical Polymers

(MT®)

Medical device researchers and manufacturers use Celanese MT® (Medical and Pharmaceutical) grade polymers to design products capable of moving parts, precision dosing and wear resistance. Devices such as orthopedic implants last longer and are more lifelike when made with these polymers. Insulin injection pens and measured drug delivery devices, such as syringes and asthma inhalers, are made stronger with MT® grade polymers that are durable, reliable and compliant.

Celanese polymers are tested to have the required medical properties to ensure operational consistency for patients and practitioners.

Product Properties for MT® Medical and Pharmaceutical Polymers:

- Excellent mechanical performance
- Superior materials that are highly tested for wearability
- Excellent aesthetic properties to mold complex shapes and forms
- High performance quality, durability and operational consistency
- Compliant with most current regulatory criteria
- Effective, functional and accurate designs that streamline processing
- Superior continuity of supply and technical support

Processing

- Injection molding
- Additional processing conditions available depending on product formulation

Medical and Pharmaceutical Polymers

(Tribological Polymers

(SlideX®)

The Celanese tribology product platform includes the most advanced engineering polymers to help meet emerging needs across many market segments. Manufacturers need conveyors made from more durable and versatile materials with better chemical resistance and lower friction. Temperature-resistant materials and those that can be used without grease are also in demand. Low- and no-dust materials are critical for most manufacturers whether they produce food, electronics, sports equipment or medical supplies.

With Celanese tribology solutions, you will find the most comprehensive low-wear, -friction and -noise product portfolio in the industry.

Product Properties for Tribological Polymers (SlideX®)

- Superior tribological application analysis and testing
- Excellent technical support from lab to manufacturing
- Excellent durability, versatility and chemical resistance
- Low- or no-dust materials meet critical manufacturer demand
- Quiet, smooth sliding parts

Improved Crystallization Evolution Polymers

(Fortron® polymer ICE)

Fortron® ICE PPS polymers have material properties that are equivalent to or better than standard injection molding grades and significantly improve processing characteristics. Fortron® ICE PPS grades can help customers stay competitive by reducing cycle times and overall production costs, as well as improve flatness and enable easier demolding.

Product Properties for Fortron® polymer ICE PPS

- Reduced molding cycle times
- Increased production cost savings
- Increased operating capacity
- Improved demolding of parts resulting in superior durability
- Full crystallization at lower temperatures with cold injection units