Celanese

The chemistry inside innovation™

ENGINEERED MATERIALS

SOLUTIONS OVERVIEW

PARTNERING WITH CUSTOMERS ON THE TOUGHEST MATERIAL CHALLENGES SINCE 1918

At Celanese, we develop and manufacture a variety of material solutions essential for everyday living. These solutions range from engineered thermoplastics that enable lightweighting of vehicles, enhanced connectivity for IOT infrastructure, as well as providing healthcare solutions for life. We aspire to be your preferred development partner in every region where you operate through our extensive global network in production and technology centers. Our goal is to become your development partner of choice by providing unparalleled applications capabilities and expertise, speed and agility in problem solving and our reliable, global and integrated supply network.

We continue to broaden our portfolio by adding functionality to existing polymers and acquisitions of new or highly complementary specialty materials businesses. Couple this with our depth of world-class engineering expertise and one of the largest portfolio offerings in our industry, our Engineered Materials business will act as an extension of your design team, supporting you to achieve your business goals.

We also have a deep sense of responsibility to develop sustainable solutions to help our customers achieve their sustainability objectives. Celanese is much more than just a provider of engineered materials, we are focused on developing and expanding our sustainable product offerings to help "close the loop" on production and consumption. At Celanese, we recognize our customer's aspirations and can tailor offerings to take your applications to the next level of performance. I invite you to get to know Celanese Engineered Materials better. We look forward to finding out how we can work together to bring you cutting edge solutions that improve the world."

TOM KELLY
Senior Vice President, Engineered Materials

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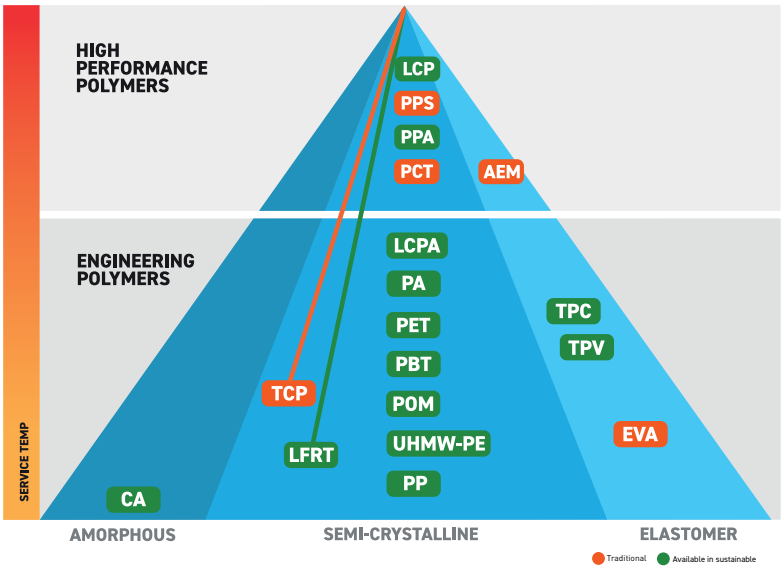
DESIGNING THE FUTURE TOGETHER

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 and technical service, 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, sustainable and financial requirements to select the material solution that will meet your current and future needs.

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
- Excellent electrical properties
- Flame retardancy
- Low moisture absorption
- Tough durability
- Chemical corrosion and temperature resistance
- UV stability
- Built-in aesthetics
- Increased operational efficiency
- Sustainability



GLOBAL FACTORY LOCATIONS:

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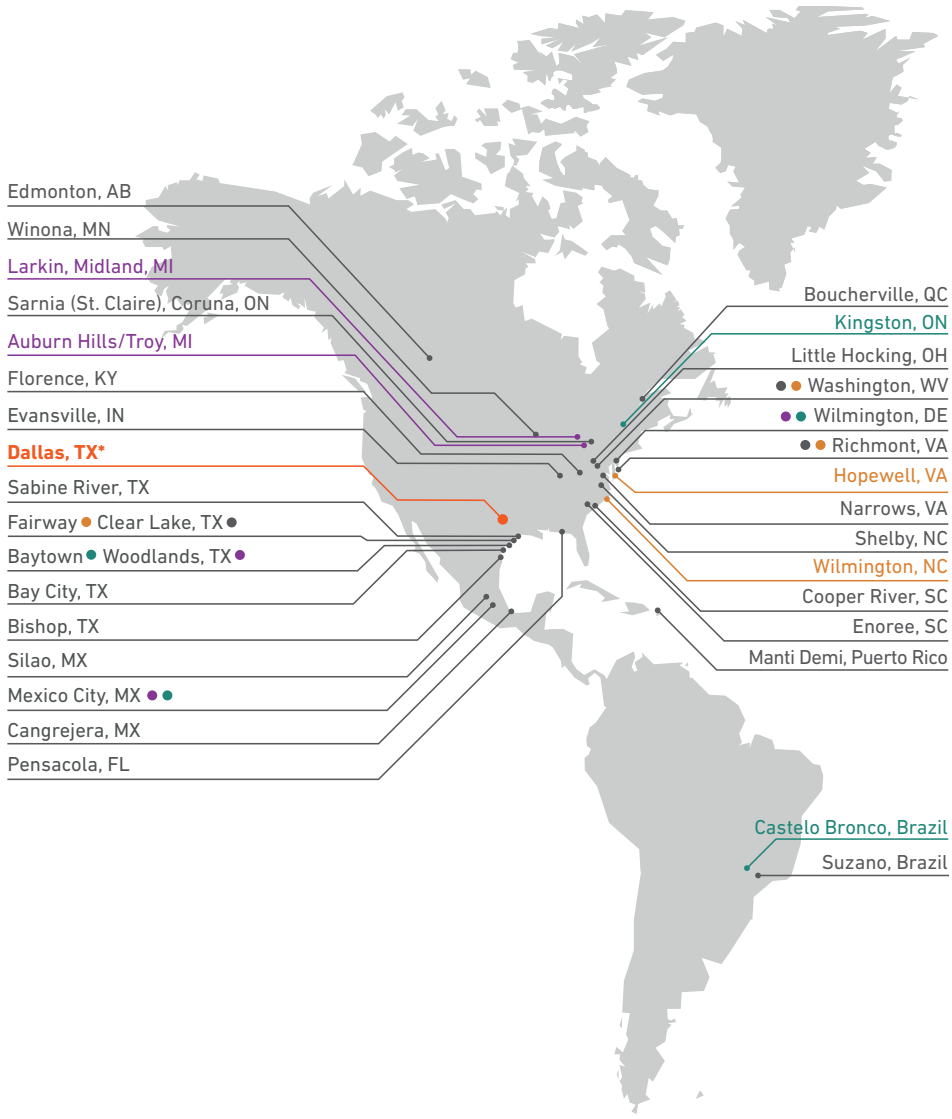
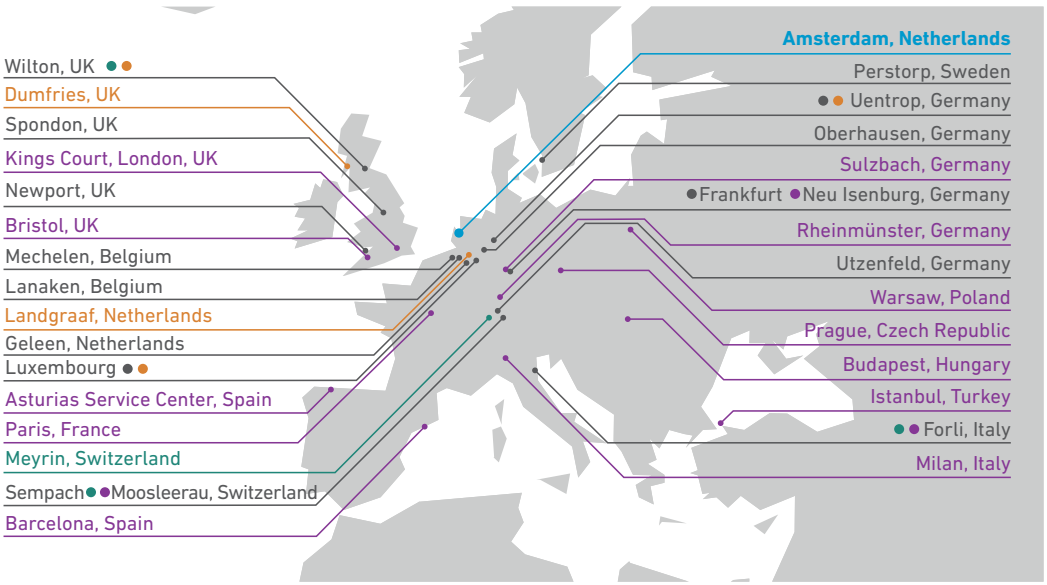


Celanese maintains a global presence to meet the sales and manufacturing needs of customers around the world.

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.

- Corporate HQ
- Regional HQ
- Commercial Center
- Lab
- Manufacturing
- Joint Ventures

EUROPE (INCLUDING JOINT VENTURES)



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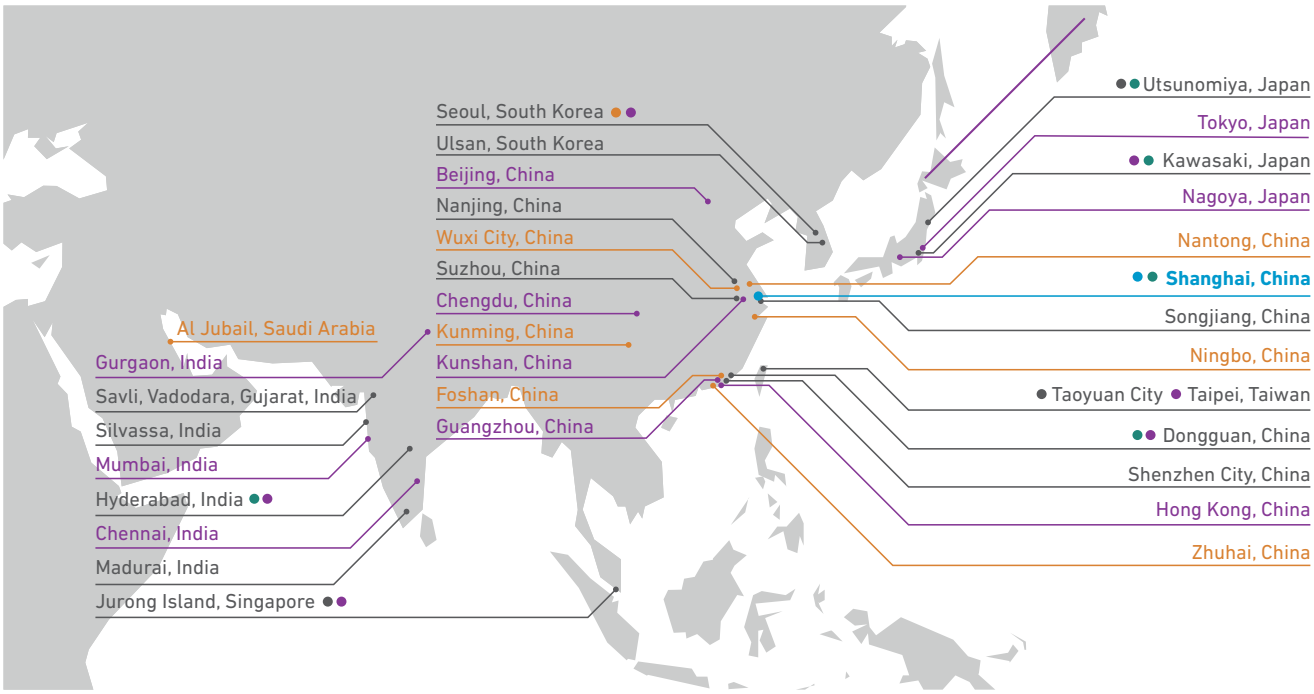


TECHNICAL SERVICE & SUPPORT

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.

CAPABILTIES

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

DESIGN/CAE SERVICES

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

ENGINEERING

1. Application Development
2. Application Processing & Prototyping

CUSTOMIZED APPLICATION TESTING

1. Comprehensive Material
2. Application Testing Capabilities

SUSTAINABILITY OFFERINGS

A CELANESE SUSTAINABLE SOLUTION

Sustainability is at the center of our business. We are focused on expanding our differentiated chemistry and specialty materials solutions that help our customers lower the carbon footprints of their products and move toward a circular economy."

LORI J. RYERKERK
Chair, Chief Executive Officer and President

Recycled Content (ECO-R)

Zytel® PA, Frianyl® PA, Rynite® PET, Celanex® PBT/PET, Santoprene® TPV, Tecnoprene® PP

Bio-Content

Bio-Circular Mass Balance (ECO-B[1]):
Hostaform® POM, Celcon® POM, Celanex® PBT, Hytrel® TPC, GUR® UHMW-PE, Celstran® LFRT[2], Vectra® LCP[2], Zenite® LCP[2]

Biobased: Zytel® LCPA; Zytel® HTN; Hytrel® TPC

Biodegradable: Clarifoil® Cellulosic Film

Carbon Capture (ECO-C)

Hostaform® POM*, Celcon® POM*

[1] Exception: BioPolymers (Clarifoil Cellulosic Film) will not carry the "ECO" name.
[2] availability planned for Q2 2024

Recycled Content: ECO-R Portfolio

RECYCLED CONTENT

ECO-R Concept

- Products that contain **post-industrial or post-consumer recycled content** (PIR or PCR)
- Strict quality standards and controlled blending methods to maximize quality and minimize variability
- Mass balance: **ISCC+ certifie**d with identical quality and performance properties that enable **drop-in replacement**
- Physically segregated: controlled blending to meet minimum quantity in final product

ECO-R Brand	Approach	CO_2 Reduction[1)]	Recycled Content	Feedstock
Zytel® PA	Mass Balance & Segregated	up to 32%	30% of total	PIR PA
Frianyl® PA	Segregated	up to 18%	30% of polymer	PIR PA
Rynite® PET	Mass Balance & Segregated	up to 59%	30% of total (MB) /up to 100% of polymer	PCR PET
Celanex® PBT/PET	Segregated	up to 12%	25% of total	PCR PET
Santoprene® TPV	Segregated	up to 26%	15-45% of total	PCR PP
Tecnoprene® PP[2)]	Segregated	up to 23%	30% of total	PIR PP

Products made from non-fossil fuel plant or organic feedstock

BIO-CONTENT

Bio-circular Mass Balance Portfolio (ECO-B)

- Bio-circular feedstock (preferably 2nd generation biomass, waste based) using a **mass balance** approach
- Independent **3rd party audited** mass balance certification (ISCC+, REDcert[2])
- Significant increase in **renewable content** and **reduction of PCF** vs standard fossil equivalents
- End products have identical quality and performance properties that enable **drop-in replacement**

ECO-B Brand	PCF Reduction[3)]	Bio-Content	Feedstock
Hostaform® POM / Celcon® POM	up to 50%	up to 97%	Bio-circular Methanol
Celanex® PBT / Crastin® PBT	up to 50%	up to 40%	Bio-circular BDO
GUR® UHMW-PE	>100% (carbon negative)	>99%	Bio-circular Ethylene
Hytrel® TPC	up to 20%	up to 73%	Bio-circular Polyether
Celstran® LFRT (exp. for Q1/24)	under evaluation	targeting 30%	Bio-circular Polypropylene
Vectra® LCP / Zenite® LCP (exp. for Q2/24)	under evaluation	up to 60%	Bio-circular Aromatics

Bio-based renewably-sourced Portfolio

- Products containing non-depleting **1st or 2nd generation biomass**
- Traceability using the **physical segregation** approach
- Bio-carbon content is self-certified and can be measured with C14 method (ASTM D6866-18, ISO16620-2)
- Significant increase in **renewable content** and **reduction of PCF** vs standard fossil equivalents

Brand	PCF Reduction[3)]	Bio-Content	Feedstock
Zytel® LCPA *RS*	up to 40%[4)]	up to 100%	Castor Oil
Zytel® HTN *RS*	up to 50%[4)]	up to 100%	Castor Oil
Hytrel® TPC *RS*	up to 20%	up to 73%	Bio Polyether

1) PCF is based on life cycle analysis following ISO methodology. Comparisons are on a polymer only basis against virgin, fossil-based counterpart except where noted otherwise.
2) Available only in Americas and Europe regions
3) CO_2 results are based on life cycle analysis following ISO methodology. Comparisons are on a polymer only basis against virgin, fossil-based counterpart except where noted otherwise.
4) Compared to virgin, fossil-based PA66

Products manufactured from captured CO_2 emissions converted into methanol.

CARBON CAPTURE

Solutions that help customer achieve improved sustainability through differentiated product characteristics or design but may not contain any sustainable content or be sustainably produced.

ENABLER SOLUTIONS

FEATURED INDUSTRIES

MEDICAL: BRINGING SCIENCE TO LIFE

Improve patient care with cutting-edge medical and pharmaceutical solutions and expertise, delivering next-generation design flexibility for your medical devices and pharmaceutical programs. Celanese designs solutions to help you launch innovative devices and therapies that improve patient care. We invest in cutting-edge medical and pharmaceutical materials and expertise to ensure next-generation design flexibility. Our cross-functional customer project teams, including in-house technical experts, zero in on the unique needs of your project and design the ideal, bespoke package of service, product and support, helping accelerate your project timeline.

HIGHLIGHTED FEATURED GRADES

Material	Description	Sustained drug delivery	Injection devices	Inhalation devices	Patient monitoring	Medical tubing	Implantable medical devices	Surgical tools	Medical packaging	Laboratory and diagnostic equipment
VitalDose® EVA	This versatile platform for implants and inserts, with a long-established clinical and regulatory history in approved parenteral drug products, enables very high drug loadings (>75%). Get tunable sustained release of therapeutics such as mAbs, RNA, and small molecules over periods of weeks to months to years.	●								
Vectra® MT® LCP	Design more compact, intricate components for connected wearable devices with Vectra MT LCP. Exceptional flow in thin-wall molding enables smaller parts and frees up internal space, enabling integration of electronic functionality into structural components.		●	●	●			●		●
Hostaform® MT® POM (or ECO-B)	Hostaform MT POM is a thermally stable polymer with high chemical resistance, high hardness and rigidity, excellent impact resistance, and good sliding properties. Hostaform® MT® SlideX® POM is a tribologically modified copolymer for quiet, smooth sliding medical parts (including POM/POM).		●	●	●					
Celanex® MT® PBT and Crastin® PBT	Celanese PBT materials demonstrate ideal sliding and wear behavior with high-dimensional stability and good chemical resistance to polar and non-polar solvents. Available in made-to-order colors in with technical support from the Celanese Color & Appearance Solutions Center.		●	●	●			●	●	●
OmniTech® HCT® ABS	Achieve beautiful aesthetics for colored, molded medical parts with made-to-order colors supported by the Celanese Color & Appearance Solutions Center. Stable, regulatory-compliant colors reduce risk in your medical innovations while offering easy processability and fast cycle times.		●	●				●		●
Fortron ® MT® PPS	High operating temperature, sterilizability and static and dynamic mechanical properties make Fortron MT PPS a leading candidate for metal replacement in surgical instruments and other medical equipment. PPS also provides high thermal stability; excellent chemical resistance; and high stiffness, strength and creep resistance			●				●	●	●

Material	Description	Sustained drug delivery	Injection devices	Inhalation devices	Patient monitoring	Medical tubing	Implantable medical devices	Surgical tools	Medical packaging	Laboratory and diagnostic equipment
Zytel® HTN PPA	Zytel® High-Temperature Nylon (HTN) polyphthalamide solutions offer especially high performance for demanding applications, helping to reduce weight, improve strength, enhance durability, increase thermal performance and simplify processing.		●	●				●		●
Zytel® PA66 and PA6 Zytel® LCPA	Zytel polyamide resins deliver high-performance benefits ranging from stiffness to heat resistance.		●					●	●	
Ateva® G EVA	EVA polymers rare inherently phthalate-free and eliminate migratory plasticizer and incineration issues. Very low extractables / leachables; excellent tear, puncture, imapact, and water resistance; optically transparent; and excellent low-temperature performance provide additional benefits.								●	
Santoprene® TPV	Santoprene TPV performs like a rubber and processes like a thermoplastic, delivering excellent performance in medical applications that require biocomptability, sterilization, flex fatigue, chemical resistance and long term sealing capability.		●		●	●			●	●
Hytrel® TPC	Hytrel TPC is super-resilient, providing excellent flex fatigue resistance and spring-like properties, and can be used over a wide range of temperatures while still retaining its flexibility and mechanical properties. It enables parts and products that combine the best features of both high performance rubbers and flexible plastic materials.		●			●		●	●	●
Micromax™ Conductive Inks	Micromax screen printable conductive inks utilize various metallurgies and are used to create bio and other types of sensors. These materials enable the production of reliable, consistent, and high-quality electrochemical electrodes used in medical monitoring, diagnostics, drug delivery, and food and environmental sensors.				●					●
GUR® UHMW-PE	GUR UHMW-PE provides outstanding abrasion resistance and superior impact resistance with non-sticking and self-lubricating properties. It can be sterilized and crossliked by gamma, e-beam and even x-ray, and can be sterilized by gamma, e-beam, gas plasma or EtO.						●			●

ELECTRICAL & ELECTRONICS: ENABLING NEXT GENERATION CONNECTIVITY

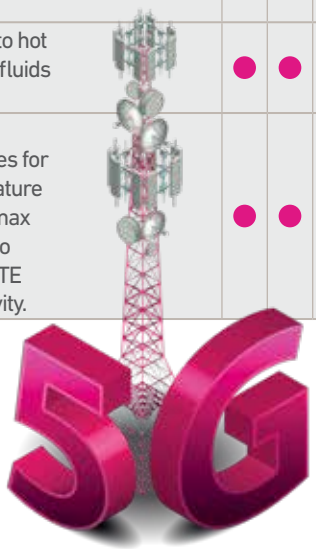
Advanced network connectivity is paving the way for communication infrastructure, consumer electronics and emerging IOT innovations and so on, and the demands for faster high-speed connectivity, increased safety and reliability, design flexibility, and sustainability is ever increasing. As these demands increase, so does the demand for newer grades of engineering plastics that can perform up to the demands of balanced dielectric constant (Dk) and dissipation factor (Df), EMI shielding, thermal management as well as miniaturization capabilities. In response to these critical industry demands, Celanese has developed new grades of high-performance material solutions that have been uniquely engineered to convert your great idea into reality.

HIGHLIGHTED FEATURED GRADES

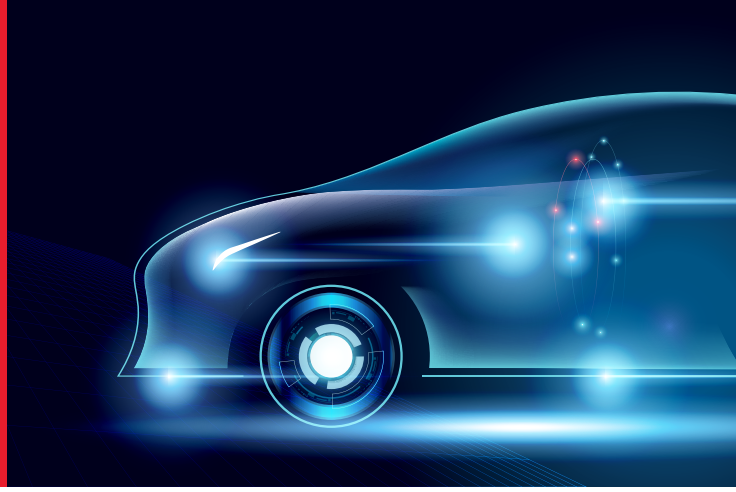
		5G Connectivity	Consumer Electronics	EV Charging Infrastructure	Connectors	Electrical Components	Wire & Cable
Vectra® and Zenite® LCP	Vectra® and Zenite® LCP products offer a new high- performance, tailored Dk/Df Zenite® LCP portfolio, specifically designed to achieve the most reliable network connections. More importantly, Celanese can engineer the product to have the Dk and Df value that you need to achieve reliable, vast and highspeed network connections. Vectra® and Zenite® LCP meet a wide range of applications, combining greater signal integrity and high-speed server connections for improved data transfers.	●	●	●	●	●	
Fortron® PPS	Fortron® PPS with low moisture uptake minimizes Dk/Df shift under harsh conditions and results in minimal signal loss. It also offers good platability while withstanding SMT 265° C.	●	●	●		●	
Frianyl® PA	Frianyl® offers high stiffness and strength at elevated temperatures, high dimensional stability, excellent creep resistance, and resistance to chemicals and hydrolysis. To meet complex requirements of mobile devices, we've expanded our Frianyl® PPA to offer flame-retardant grades for all colors.	●	●	●	●	●	
Coolpoly® TCP	Our series of CoolPoly® TCP can provide optimum cooling with significant weight savings and productivity.	●		●			
Celanex® and Crastin® PBT	Low Dk Celanex® PBT solutions provide good metal adhesion and properties for mobile device' s frames. Crastin® PBT grades are offered to meet the most stringent Electrical Insulation Standards (EIS) and enables Celanese to offer the industry's largest portfolio of materials pre-approved by Underwriters Laboratories (UL) and recognized to International Electrotechnical Commission (IEC) standards.	●	●	●	●	●	
Thermx® PCT	The added heat resistance of Thermx® PCT makes it particularly well suited for demanding electrical / electronics applications. Customers also benefit from its fast-molding cycles and excellent processability.			●			

Celanese has the experience and expertise in providing solutions for the E&E industry to positively impact the next generation of 5G connectivity, connectors, electrical components, wire and cable, consumer electronics, and charging technology.

		5G Connectivity	Consumer Electronics	EV Charging Infrastructure	Connectors	Electrical Components	Wire & Cable
Rynite® and Impet® PET	With their lightweight, glass-reinforced composition, dimensional stability, durability and high-gloss finish, Rynite® and Impet PET® helps make electrical devices, photovoltaic panels, switches and other critical energy components stronger and reliable.			●		●	
Celstran ® LRFT	Celstran® LFRT has a special series of products with stainless steel fiber reinforcement to greatly improve EMI shielding with high frequency in advanced network connectivity.		●			●	
Santoprene® TPV	Santoprene® TPV provides excellent electrical properties, wide temperature resistance, design flexibility and in-process recycling during the conversion phase and the potential for recycling at the end of life.	●	●	●	●	●	
Hytrel® TPC	Hytrel® TPC offers outstanding flexibility, stable mechanical performance over a wide temperature range and straightforward processing characteristics.		●	●	●	●	●
Vamac® AEM	End products based on Vamac® AEM have excellent resistance to hot oils and hydrocarbon- or glycol-based lubricants, transmission fluids and power steering fluids.	●	●	●	●		●
Micromax™ Electronic Inks and Pastes	Micromax™ Electronic Inks and Pastes offers the most comprehensive suite of printed electronics products and services for 5G telecom, including GreenTape™ Ceramic Tapes low-temperature co-fired ceramic (LTCC) materials and thick film hybrids. Micromax Electronic Inks and Pastes products are inherently impervious to moisture and offer higher reliability, higher hermeticity, lower CTE (coefficient of thermal expansion) and higher thermal conductivity.	●	●				



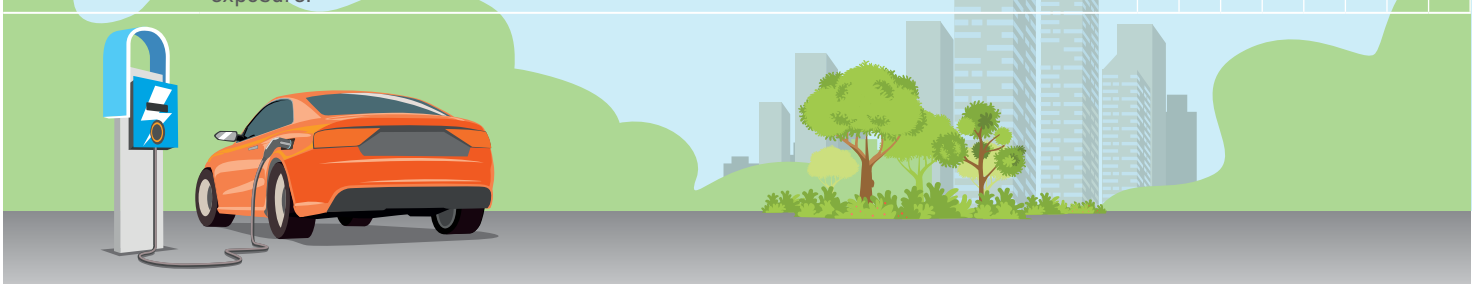
ELECTRIC VEHICLES: DRIVING ELECTRIFIED MOBILITY



Leading OEMs and tiers are developing components in electric powertrain with new requirements to enhance safety, reduce costs and extend range and lifetime. Celanese supports these demands by offering a broad portfolio to address these challenges. Customers can benefit from translating our knowledge from the E&E industry to develop new solutions for future mobility. Our battery separator materials and flame-retardant grades for battery components enhance safety, and our thermally conductive grades for sensors and thermal management parts extend range and lifetime.

HIGHLIGHTED FEATURED GRADES

Material	Description	Battery Cell	Battery System	High Voltage Connectors	Thermal Management	Traction E-Motors	Power Electronics	Fuel Cell	Charging Technology
GUR® UHMW-PE	Consistent product quality leads to high quality membranes and improved productivity to enable faster charging	●							
Tecnoprene® PP	PP that is reinforced with chemically-bonded glass fiber and is utilized in housings for EV requiring high rigidity and strong mechanical resistance at moderate temperatures		●		●				●
Celanex® PBT	PBT offers excellent electric insulating performance, combined with good temperature resistance and flame retardancy for HV connectors and power electronics		●	●			●		
Hostaform® POM	Acetal copolymer possesses a linear structure with a highly crystalline quality that provides a variety of characteristics				●				●
Fortron® PPS	Meet the needs for extended thermal mangement with PPS and flex PPS for resistance to cooling agents and lifetime performance in high heat applications	●		●	●	●	●	●	
Vectra® and Zenite® LCP	LCP grades for use under very high temperatures and chemical conditions, for thin wall applications in traction e-motors with excellent insulation properties	●	●		●	●	●		
Frianyl® and Zytel® PA	For battery safety PA grades offer excellent electrical insulation properties in combination with high flame retardancy and thermal shock resistance		●	●					
Celanyl® and Zytel® PA	PA compounds can address multiple thermal, mechanical, electrical, and tribological requirements in electric vehicles		●		●		●		●
Celstran® LFRT	Using LFRT could reduce weight by keeping tructural rigidity and performance in harsh conditions with possibility for functional integration when used for structural parts		●				●		●
Coolpoly® TCP	For improved thermal management thermally conductive plastics exhibit electrical conductivity in addition to their thermal conductivity.				●	●	●		
Santoprene® TPV	System solutions incorporate post-consumer recycled content while keeping quality high and optimizing cost-efficiency for demanding sealing applications		●		●				●
Zytel® HTN	Even more than standard polyamide resins, the HTN range of PPA resin offers especially high strength and stiffness over a wide range of temperatures, chemicals and moisture exposure.		●	●	●	●	●	●	●

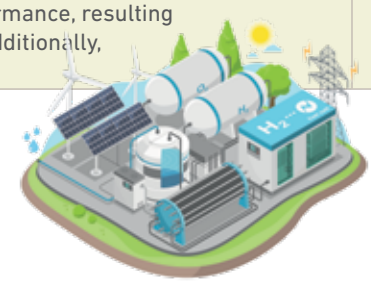


CLEAN ENERGY: SHAPING THE TRANSFORMATION OF THE ENERGY INDUSTRY

Celanese is committed to enabling market leaders to optimize their Green Energy opportunities with a dedicated portfolio of polymers that enable technology development. Our energy polymers feature many favorable attributes for the modern clean energy industry such as exceptional mechanical and electrical performance, high abrasion resistance, corrosion and low moisture absorption resistance, high thermal and dimensional stability and low weight features.

HIGHLIGHTED FEATURED GRADES

Material	Description	Electrolyzer	Energy Storage	Solar	Wind	Water
Vectra® and Zenite® LCP	Vectra® and Zenite® LCP are part of a family of halogen-free, high-performance liquid crystal polymers with exceptionally stable dimensions.		●			
Fortron ® PPS	Fortron® PPS delivers excellent chemical resistance, low ion leaching and very good hydrolysis resistance while it is inherently flame retardant	●	●			●
Zytel® PA and Zytel® LCPA	Zytel® polyamide resins deliver high-performance properties ranging from stiffness to heat resistance.		●	●		
Frianyl® and Zytel® PPA	Frianyl® and Zytel® PPA offer a very good balance in mechanical properties at elevated temperatures, good dimensional stability, excellent creep resistance, and resistance to chemicals and hydrolysis. Frianyl® offers flame-retardant grades for all colors.		●	●		
Coolpoly® TCP	Our series of CoolPoly® TCP can provide optimum cooling with significant weight savings and productivity compared to metal.		●			
Celanex® and Crastin® PBT	Delivers excellent electrical properties while having a very well balanced mix of mechanical properties even at high temperatures. In addition it has good resistance to a wide range of chemicals and solvents.		●	●	●	●
Rynite® and Impet® PET	PET helps make photovoltaic panels, switches and other critical energy components stronger and more reliable.			●		●
Celstran ® LRFT	For excellent mechanical properties, impact and creep resistance and low warpage for metal replacement applications			●	●	●
Santoprene® TPV	Santoprene® TPV behaves like a rubber but processes like a thermoplastic. As a sealant it can maximize productivity, drive cost reduction (robotic extrusion), while ensuring excellent properties.	●	●	●	●	
Hytrel® TPC	Hytrel® TPC offers outstanding flexibility, stable mechanical performance over a wide temperature range and is easy to process.			●	●	●
Vamac® AEM	End products based on Vamac® AEM have excellent resistance to hot oils and hydrocarbon- or glycol-based lubricants, transmission fluids and power steering fluids.		●	●		●
GUR® UHMW-PE	GUR® UHMW-PE provides outstanding purity and gelation performance, resulting in high-quality membranes that boast minimal risk of failure. Additionally, it delivers exceptional mechanical strength and permeability.		●	●		



PROVIDING MATERIAL SOLUTIONS ACROSS GLOBAL INDUSTRIES

Celanese's high-performance engineering resins offer superior performance in characteristics, including resistance to fatigue, creep, friction and wear, and deliver good mechanical properties such as stiffness and strength. Our portfolio provides cutting-edge material solutions across global industries. Celanese is a world leader in materials like acetal

		Aerospace	Automotive and Transportation	Building and Construction	Consumer Goods	Electrical and Electronics
SEMI-CRYSTALLINE	POM	●	●	●	●	●
	PET		●		●	●
	PBT		●		●	●
	LCP	●	●		●	●
	PA		●	●	●	●
	PPA		●		●	●
	PCT		●		●	●
	PP Compounds		●		●	●
	PPS	●	●	●	●	●
	UHMW-PE		●			●
	EVA		●		●	●
THERMOPLASTIC ELASTOMER	TPV		●	●	●	●
	SBS				●	
	SEBS		●		●	●
	TPO		●	●	●	
	AEM		●	●		●
	TPC		●		●	●
BIOPOLYMER SOLUTIONS	Cellulosic Pellets & Film				●	
TECHNOLOGY	LFRT	●	●	●	●	●
	TCP		●		●	●
ELECTRONIC INKS AND PASTES	Micromax™	●	●		●	●

copolymers, liquid crystal polymers, long fiber reinforced thermoplastics and ultrahigh molecular weight polyethylene. Focused application development and technical services make the company a main business resource for customers in key industries throughout the Americas, Europe and the Asia-Pacific region.

Energy	Industrial and Manufacturing	Medical and Pharma	Oil, Gas & Mining	Packaging	Personal Care and Cosmetics	Telecom	
●	●	●			●	●	POM
	●			●	●		PET
		●				●	PBT
●	●	●				●	LCP
●	●					●	PA
●	●		●	●		●	PPA
						●	PCT
						●	PP Compounds
	●		●			●	PPS
●	●	●	●				UHMW-PE
●		●					EVA
●	●	●	●	●	●	●	TPV
	●						SBS
●		●					SEBS
							TPO
●	●					●	AEM
●	●	●			●	●	TPC
				●			Cellulosic Pellets & Film
●	●					●	LFRT
●						●	TCP
		●		●		●	Micromax™

POM
(POLYOXYMETHYLENE)

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

Hostaform® & Celcon® POM

POM – also known as acetal or polyacetal – is a highly crystalline, high-performance engineering polymer that displays a broad range of properties, particularly its low coefficient of friction, excellent wear resistance, high modulus and resistance to many solvents and automotive fuels. Basic mechanical properties of acetal copolymers include high strength and stiffness coupled with good impact strength.

Low moisture absorption results in excellent dimensional stability and makes Hostaform® & Celcon® POM an excellent candidate for parts that must exhibit tight tolerances in moist environments.

As a leading acetal copolymer manufacturer, Celanese provides a variety of POM grades that span a wide array of applications & industries, due to their high-performance thresholds.

Hostaform® POM ECO-B and Celcon® POM ECO-B

offer a bio-circular solution with a reduction in carbon dioxide emission without sacrificing inherent characteristics of the material.

Hostaform® POM and Celcon® POM grades are drop-in place solutions; no product requalification required.

Product Benefits of Hostaform® & Celcon® POM

- Good toughness (to -40°C)
- Very hard and rigid
- Easy colorization
- Good heat distortion temperature (to 100°C)
- Very good slip/wear properties
- Excellent chemical resistance to fuels, solvents, and strong alkalis
- Excellent resilience
- Low moisture absorption
- Resistant to stress cracking

Available Grades

- Reinforced grades for improved heat distortion temperature and stiffness
- High-impact grades with step-change improvement in energy absorption
- Grades with improved media resistance
- Conductive grades to dissipate or conduct electrical charges
- Medical and pharmaceutical compliant grades where stringent requirements are enforced
- Low emission grades for automotive interior applications
- Appearance effects, laser marking, low gloss and metallic effect product
- Improved friction and wear grades
- ECO-B Sustainable grades: up to 97% bio-content (from renewable feedstock waste that does not use or contain food or feed crops) via ISCC+ Certified mass-balance approach. LCA report for POM ECO-B shows ~50% CO_2 reduction on polymer basis for our POM ECO-B solutions

Processing

- Injection molding
- Extrusion
- Rotational molding
- Blow molding

PET
(POLYETHYLENE TEREPHTHALATE)

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

Product Benefits of Impet® PET

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

Available Grades

- Glass fiber reinforced
- Glass fiber & mineral reinforced
- Special color formulations
- Recycling content
- ECO-R Sustainable grades

Processing

- Injection molding

Product Benefits of Rynite® PET

- Superior flow characteristic
- High strength
- Good impact resistance
- High-temperature tolerance
- Withstands a broad range of chemicals
- Dimensional stability,
- Durability and high-gloss finish

Available Grades

- Glass fiber reinforced
- Glass fiber & mineral reinforced
- Sustainable solutions

Processing

- Injection molding

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.

Rynite® PET

Preferred across a wide range of applications, particularly as a replacement for die-cast metals and thermosets. Rynite® Polyethylene Terephthalate (PET) helps make electrical devices, photovoltaic panels, switches and other critical energy components stronger and reliable.

PET ECO-R

Rynite® PET ECO-R Mass Balance and Rynite® PET ECO-R Segregated PCR resin grades perform equivalently to standard Rynite® PET.

PBT
(POLYBUTYLENE TEREPHTHALATE)

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

Celanex® PBT and Crastin® PBT

Celanex® PBT and Crastin® PBT are a series of thermoplastic polyester polymers and compounds which features excellent dimensional stability, low moisture absorption and powerful insulation resistance, along with very good chemical and weathering resistance.

Numerous grades of Celanex® PBT and Crastin® PBT hold regulatory approvals, including VDE listing or UL certification approvals for the electrical and electronic market, or for instance EU 10/2011 food contact. compliance and FDA approval for the food and cosmetics industry, and last-but-not-least biocompatibility according to USP 25 Class VI, ISO 10993 and DMF listing for medical markets. These features make PBT the material of choice for many sensitive or regulated applications.

Celanex® PBT ECO-B and Crastin® PBT ECO-B

Celanex® PBT and Crastin® PBT ECO-B grades are drop-in place solutions; no product requalification required.

Celanex® PBT/PET ECO-R

Product Benefits of Celanex® PBT and Crastin® PBT

- Very hard, rigid and strong
- Good creep resistance
- High heat-distortion temperature, especially for glass fiber-reinforced grades
- Continuous use temperature up 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
- Paintable / printable

Available Grades

- Unreinforced / unfilled
- Glass fiber (GF) reinforced
- Glass bead (GB) filled
- Glass fiber + Mineral-filled (GF/Min)
- Carbon fiber reinforced (ICF)
- Glass fiber reinforced with high surface gloss
- Low warpage (LW)
- UV stabilized (UV / HL)
- Laser markable (LM)
- Hydrolysis (HR) and alkaline resistant (AR)
- Recycling (R) content
- Impact modified / toughened (T)
- Slip & Wear modified (SW)
- High flow (HF)
- Flame retardant (conventional FR)
- Flame retardant (halogen free: XFR ®)
- Food contact compliant (FC)
- Medical and Pharmaceutical Polymers (MT®)
- Appearance Polymers (MetaLX®)
- Laser transparent (LT)
- **ECO-B Sustainable grade**: up to 40% certified bio-content (from renewable feedstock waste that does not use or contain food or feed crops) via RedCert mass-balance approach. LCA report for PBT ECO-B shows ~45% CO2 reduction on polymer basis for our PBT ECO-B solutions
- **ECO-R Sustainable grades**: Recycled content min 25% for PBT/PET blends (average based on recipe). Recycle source PET for PBT/PET blends and Carbon fiber for ICF grades

Processing

- Injection molding
- Extrusion
- Melt blown
- Spun bond
- Fiber spinning
- Physical foaming
- Water and Gas Injection Technology (WIT/GIT)

PBT
(POLYBUTYLENE TEREPHTHALATE)

CONTINUED . . .

Product Benefits of 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 / printable

Available Grades

- Unreinforced
- Glass fiber reinforced
- Mineral-filled
- Extreme high impact modified
- Flame retardant

Processing

- Injection molding
- Extrusion

Vandar® PBT

Vandar® PBT combines 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 -40°C. Vandar® PBT products are available as unreinforced grades, as well as grades reinforced with glass fibers and glass beads or minerals. Glass fiber reinforced Vandar® PBT alloys grades provide added strength and toughness over a wide temperature range, from -40°C to 130°C.

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.

Vectra® and Zenite® LCP ECO-B

Vectra® and Zenite® LCP ECO-B grades are drop in place solutions; no product requalification required (availability planned for Q2 24).

Product Benefits of 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 (specific grades are BPA- and PTFE-free)

Available Grades

- Easy flow
- Glass fiber reinforced
- Carbon fiber reinforced
- Fiber/filler modified
- Electroplated
- Electrically shielded & conductive
- 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
- Tailored electrical properties like Dk and Df

Processing

- Injection molding
- Extrusion
- Co-extrusion
- Thermoforming

PA
(POLYAMIDE)

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

Zytel® PA resin and Zytel® LCPA resin

We invented nylon more than 70 years ago. Today, we continue to refine and expand our Zytel® PA range of polyamides to deliver solutions to manufacturers around the globe and across a broad spectrum of end-use industries. Zytel® polyamide resins deliver high-performance benefits ranging from stiffness to heat resistance.

Product Benefits of Zytel® PA resin

- Stiffness and toughness
- Heat resistance
- Dimensional stability
- Ease of processing

Product Benefits of Zytel® LCPA resin

- High temperature resistance
- Resistance to chemicals
- Low fuel and gas permeability
- Grades offering stiffness or flexibility
- Salt resistance
- Solutions based on renewably-sourced precursor materials

Available Grades

- Glass fiber reinforced solutions
- Grades offering flexibility (Zytel LCPA)
- Hydrolysis resistant
- Chemical resistance
- Heat stabilized

Processing

- Injection molding
- Extrusion

Zytel® LCPA RS

Zytel® LCPA RS grades perform equivalently to virgin, fossil standard.

Zytel® PA ECO-R Mass Balance

Zytel® PA ECO-R grades with mass balance are drop in place solutions; no requalification required.

Zytel® PA ECO-R Segregated

Zytel® PA ECO-R segregated grades offer a range of options to incorporate recycled content.

PA
(POLYAMIDE)
CONTINUED . . .

Celanyl® PA

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

Product Benefits of Celanyl® PA 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 Benefits of Celanyl® PA Specialty Compounds

- Tribological products for low wear and friction
- Electrically conductive and dissipative
- Cross linkable
- Effective alternative to metal
- High mechanical strength
- Water 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
- Extrusion
- Co-molding with special grades of Laprene® (SEBS-based thermoplastic elastomer)

PA
(POLYAMIDE)
CONTINUED . . .

Frianyl® PA66 & PA6

Frianyl® A6 and PA66 flame retardant compounds are material solutions for the electrical & electronics, industrial and railways industries.

Frianyl® PA ECO-R

Frianyl® PA ECO-R grades have UL94-listing for short-term properties at 0.8 mm. RTI values at 130°C manageable but not UL-listed.

Product Benefits of Frianyl® PA

Multiple flame technologies available:

- Halogen and red phosphorous-free reinforced and unreinforced
- 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
- Halogen: from unfilled up to 30% glass fiber or mineral filled
- ECO-R Sustainable grades

Processing

- Injection molding

PPA
(SEMI-CRYSTALLINE POLYPHTHALAMIDE)

High Performance Polyamide in the poylamide family. PPA based polymers are molded into parts to replace metals in applications requiring high temperature resistance such as automotive powertrain components, the housing for high temperature electrical connectors and many other uses.

Zytel® HTN and Celanyl® PPA resins

Zytel® HTN and Celanyl® PPA resin are a range of materials based on polyphthalamide semi-aromatic nylons. Even more than standard polyamide resins, the HTN range offers especially high strength and stiffness over a wide range of temperatures and exposure to chemicals and moisture.

Zytel® HTN RS

Zytel® HTN RS grades perform equivalently to virgin, fossil standard.

Product Benefits of Zytel® HTN and Celanyl® PPA resins

- Low effect of moisture
  - Excellent retention of properties
  - Good dimensional stability
- Good high temperature properties
- High melting point range, up to 315°C (600°F)
  - High glass transition temperatures, dry, 80°C (176°F) to 141°C (286°F)
  - Low coefficient of thermal expansion, reinforced grades
- Chemical resistance to: glycols, motor transmission and transformer oil

Stiffness

- High strength
- Excellent creep resistance
- Broad temperature toleration
- Versatile and easy to process
- Fatigue-resistant

Available Grades

- Glass fiber reinforced
- Flame retardant
- Laser markable
- Laser weldable
- Non-halogenated flame retardant
- Hydrolysis resistant
- Heat stabilized
- Sustainable solutions available
- tribological optimized
- transparent
- glass fiber reinforced

Processing

- Injection molding
- Extrusion

PPA
(SEMI-CRYSTALLINE POLYPHTHALAMIDE)

CONTINUED . . .

Frianyl® PPA

Frianyl® XT flame retardant PPA compounds material solutions for the electrical & electronics, lighting, industrial and automotive industries.

Product Benefits of Frianyl® PPA

- 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 flame retardant systems
- With halogen

Processing

- Injection molding

PPA
(SEMI-CRYSTALLINE POLYPHTHALAMIDE)

CONTINUED . . .

PARTIALLY AROMATIC Celanyl® PA XS

Partially aromatic PA compounds are material solutions for the sport & leisure, furniture and automotive industries.

Product Benefits of Celanyl® PA 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 types such as carbon fiber reinforced and low wear and friction

Processing

- Injection molding

PCT
(POLYCYCLOHEXYLENE-DIMETHYLENE TEREPHTALATE)

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

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 Benefits of Thermx® PCT

- Short-term temperature resistance up to 255°C
- Highest hydrolytical resistance for a polyester
- Low moisture absorption
- Low-flash processing
- High CTI and arc resistance
- Flame retardant grades are available reaching V-0 at 1.5 mm
- Very good electrical insulation properties

PP COMPOUNDS
(POLYPROPYLENE)

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

Polifor® PP

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

Product Benefits of 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
- Elastomer modified

Processing

- Injection molding
- Extrusion

PP COMPOUNDS
(POLYPROPYLENE)

CONTINUED . . .

Product Benefits of Tecnoprene® PP

- High impact resistance
- High fluidity
- Chemical resistant
- 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)
- ECO-R Sustainable grades: Recycled content 30% of overall formulation (average based on recipe).

Processing

- Injection molding
- Extrusion
- Blow molding
- Rotational molding

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 the polypropylene and glass fiber delivers high impact resistance, improved mechanical properties, and better performances under tensile strength. The high thermal performance and considerable impact resistance in different operating conditions make Tecnoprene® PP especially suitable for challenging technical applications. Tecnoprene® PP can be over-molded with other Celanese products, including Santoprene® TPV and Forprene® TPV, Laprene® SEBS and Sofprene T® SBS

Tecnoprene® PP ECO-R

Tecnoprene® PP ECO-R offers a 30% glass reinforced option and will expand to other grades based on market need.

PP COMPOUNDS
(POLYPROPYLENE)

CONTINUED . . .

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 Benefits of Talcoprene® PP

- High dimensional stability
- Good aesthetic
- Strong mechanical properties
- High density
- Wide range of colors available
- Thermal aging & resistance

Available Grades

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

Processing

- Injection molding
- Extrusion

PPS
(POLYPHENYLENE SULFIDE)

For high temperature stability, broad chemical resistance, stiffness, strength and creep resistance at elevated temperatures.

Product Benefits of Fortron® PPS

- 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 5VA)
- Suitable for lead-free soldering
- Excellent creep resistance at elevated temperatures

Available Grades

- Glass fiber reinforced
- Mineral reinforced
- Flexible PPS
- Toughened grades
- Thermal shock resistant
- Fiber / filler modified
- 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

Fortron® PPS

Fortron® PPS is an is an ideal candidate for mechanically and thermally stress molded or precision machined parts. Its low proportion of ion contamination gives Fortron® PPS an advantage over other materials for electronic applications.

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 molecular weight than standard PE grades, which offers high impact strength, excellent wear-resistant properties, high chemical resistance and a wide service temperature range.

GUR® UHMW-PE is used in industrial semifinished parts like sheets, rods, profiles (to be used as e.g sliding rails, liners for silos or trucks, bearings, ski soles), in medical applications, for high performance fibers, for microporous membranes (e.g. as battery separators), in porous applications (like filters, sound dampening or wicking devices) and also as functional additive for other materials and more.

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.

GUR® UHMW-PE ECO-B

GUR® UHMW-PE ECO-B grades are drop in place solutions; no product requalification required.

Product Benefits of GUR® UHMW-PE

- Exceptionally high impact strength
- High energy absorption capacity at high stress rate
- Excellent low-friction and wear properties
- Very high chemical resistance to acids, alkalis and all other chemicals except for (strong) oxidizing agents
- Highly resistant to environmental stress cracking
- Wide service temperature range from -269°C to +80°C

Available Grades

- Very broad range of products in terms of particle size and molecular weight
- Specialized grades for different applications and processing technologies (e.g. micro-powder as additive for rubber and thermoplastics)
- ECO-B Sustainable grades: Up to >99.9% certified Bio-content via ISCC Plus mass-balance

Processing

- Compression molding
- Ram extrusion
- Screw extrusion and injection molding
- Pressureless sintering
- Gel spinning (fibers)
- Gel extrusion of membranes

EVA
(ETHYLENE VINYL ACETATE)

An extremely versatile elastomeric resin that can be easy processed on conventional thermoplastic equipment. EVA copolymers offer exceptional adhesion, toughness, flexibility, resilience, clarity and excellent environmental stress crack resistance over a broad temperature range.
EVA offers environmental and safety advantages to PVC in medical and electrical application due its absence of migratory plasticizers and good organoleptics.

Ateva® EVA

Celanese manufactures a full line of high-performance Ateva® EVA copolymers containing up to 42% vinyl acetate. Ateva® EVA copolymers have a broad melt index range and are recognized around the world for their exacting quality, performance and versatility.

Product Benefits of Ateva® EVA

- Broad melt index and VA range
- Customizable controlled-release performance
- Exceptional low temperature API processing
- Custom/bespoke specialized polymer solutions
- Excellent adhesion to substrates
- Excellent processability even at low melt temperatures
- Broad polarity ensures compatibility with wide range of additives and high loadings
- High flame retardant additive loading capability
- Excellent flexural & low temperature properties
- Excellent flexibility
- Excellent weldability
- Good transparency
- High impact resistance
- Excellent low-temperature properties
- Resistant to stress cracking
- Easy processability
- Fully recyclable

Available Grades

- VitalDose™ controlled release pharmaceutical excipients
- Medical and Pharmaceutical Polymers (MT®)
- USP Class VI certification
- Food and beverage contact
- Free-flowing pellets
- Powders

Processing

- Extrusion
- Co-extrusion
- Blown film extrusion
- Cast film extrusion
- Extrusion coating
- Calendering
- Injection molding
- Blow molding
- Thermoforming
- Solvent coating
- Intensive mixing
- Compression molding
- Rotational molding
- Physical and chemical foaming
- Spunbond, Meltblown (non-woven fabrics)

TPV
(THERMOPLASTIC VULCANITE)

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

Santoprene® TPV

Santoprene® TPV is an engineered thermoplastic vulcanizate (TPV) created more than 40 years ago out of a simple concept to develop a ready-to-use material that behaves like a rubber but processes like a thermoplastic. A truly revolutionary product, it quickly became the acknowledged industry-standard for TPV.

Santoprene® TPV is used very successfully across many industries and applications including – Automotive and Electric Vehicles (EV), 5G Connectivity, Electronics and Electrical, Industrial, Consumer Goods, Oil & Gas, Medical, Healthcare and Pharmaceutical, Food and Potable (FDA & NSF Grades).

Product Benefits of Santoprene® TPV

- Wide hardness range from 35 ShA to 50 ShD
- Service temperature ranging from -60 °C to 135 °C
- Sealing performance
- UV ageing, ozone and weathering resistance
- Chemical and oils resistance
- High elastic recovery within a wide temperature range
- High flex-fatigue resistance
- High thermal and electric insulation values
- Weight reduction – through part redesign versus thermoset rubber
- Colorability – metallic, photochromic/thermochromic effects
- Aesthetics – surface, feel and appearance options
- Easy processing and total system costs reduction
- In process and end-of-life recycling
- ECO-R Sustainable grades

Available Grades

- Material with post-consumer recyclate (PCR)
- High resilience
- High flow
- UV stabilized
- Flame retardant
- Food contact grades
- Medical
- Bonding

Processing

- Injection molding, including 2k
- Blow Molding
- Extrusion
- Foaming – chemical and physical
- Calendering

MINIMUM 15% RECYCLED CONTENT
POST-CONSUMER

TPV
(THERMOPLASTIC VULCANITE)
CONTINUED . . .

Santoprene® TPV

Santoprene® TPV grades made with at least 15% and up to 45% post-consumer recycle (PCR) material, can help improve its life cycle impact compared to regular Santoprene TPV, while offering an optimized balance of performance and cost-effectiveness for many applications including for automotive parts like weatherseals.

Santoprene® TPV scrap generated during manufacturing can be melted, re-extruded or remolded, reducing the amount of waste. And, when a product reaches its end-of-life, components made with Santoprene TPV, it can potentially be recovered and recycled, further contributing to the customer's circular economy model.

SBS
(STYRENE-BUTADIENE-STYRENE COMPOUNDS)

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

Sofprene® TPS SBS

Sofprene® TPS SBS is a Thermoplastic Elastomer in which the elastomeric phase is based on SBS (Styrene-Butadiene-Styrene block copolymer) rubber and the plastic phase is usually made of either polyolefinic or styrenic polymers. Sofprene® offers excellent elastic properties and maintains its flexibility even at very low temperatures (-50°C). The unsaturated nature of the SBS rubber makes Sofprene® TPS SBS vulnerable to UV, heat and ozone; however it is possible to improve its resistance to these agents by using appropriate additives. Sofprene® TPS SBS can be easily processed by means of the traditional technologies used for thermoplastic materials and it is fully recyclable.

Product Benefits of Sofprene® TPS SBS

- Wide hardness range from 25 ShA to 40 ShD
- Density from 0.90 g/cm^3 to 1.25 g/cm^3
- Operating temperature from -50 to 60°C
- High elastic recovery both at low and room temperatures
- Excellent resistance to several chemical agents, i.e. bases, acids, alcohols, detergents, water solutions
- High thermal and electric insulation values
- Good abrasion resistance
- Specific rheology for each type of process
- Excellent colorability

Available Grades

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

Processing

- Injection molding
- Extrusion

Product Benefits of Laprene® TPS SEBS

- Excellent resistance to UV ageing, ozone and weathering
- Wide hardness range from 2 ShA to 60 ShD
- Operating temperature ranging from -50°C to +120°C
- Good fatigue resistance
- Excellent resistance to several chemical agents, i.e. bases, acids, alcohols, detergents, water solutions
- High elastic recovery within a wide temperature range
- High thermal and electric insulation values
- Specific rheology for each type of process
- Density ranging from 0.90 g/cm^3 to 1.20 g/cm^3
- Excellent colorability and aesthetic properties

Available Grades

- Standard grades for injection molding
- Translucent and transparent grades
- Extrusion grades
- Grades for adhesion on polar polymers
- Grades with very high fluidity
- Grades with improved temperature resistance

Processing

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

SEBS

(STYRENE-ETHYLENE-BUTYLENE-STYRENE COMPOUNDS)

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

Laprene® TPS SEBS

Laprene® TPS SEBS refers to a family of Thermoplastic Elastomers in which the elastic phase is made of SEBS [Styrene-Ethylene-ButyleneStyrene] rubber and the plastic phase has usually a polyolefinic nature. The plastic phase allows Laprene® to be processed by means of the traditional technologies used for thermoplastic materials and to be fully recyclable, while the elastomeric phase features typically rubber-like performance such as elastic recovery and softness.
The chemical nature of the SEBS rubber is saturated, which means it has no double bonds in the molecule, and this particular structure gives Laprene® TPS SEBS special resistance to weathering and UV ageing.

TPO
(THERMOPLASTIC OLEFIN COMPOUNDS)

For improved weather resistance, excellent electrical insulation and elastic properties at low temperatures.

Forflex® TPO

The Forflex® TPO thermoplastic elastomer family consists of heterophasic compounds based on an amorphous elastomeric phase and a crystalline phase, usually both of a polyolefinic nature. This chemical composition confers elastic properties to finished products up to a temperature of 70 - 80°C. These compounds are classified as TPOs.

Product Benefits of Forflex® TPO

- Good weathering resistance
- Excellent electrical insulation properties
- Low density (from 0.89 g/cm^3)
- Excellent elastic properties at low temperatures
- Excellent colorability
- Adhesion on PP and polyolefin based materials
- Standard grades for injection molding and extrusion

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

TPC
(THERMOPLASTIC COPOLYESTER ELASTOMER)

Thermoplastic copolyester elastomer, or TPC is a high-performance and high-temperature elastomer, with good chemical and abrasion resistance. It combines the flexibility of thermoset rubber with the strength and process ability of engineered plastics.

Hytrel® TPC

Hytrel® TPC thermoplastic elastomer is a plasticizer-free thermoplastic copolyester elastomer with outstanding flexibility, stable mechanical performance over a wide temperature range, and straightforward processing characteristics. This versatile material can flex in multiple directions, cycle after cycle, long after rubber would break. Its durability has made it an essential ingredient in applications that must endure a wide range of temperatures and tough conditions during years of service.

Product Benefits of Hytrel® TPC

- Flexibility and resilience over a wide temperature range
- Excellent flex fatigue resistance
- Resistant to tearing and flex cut growth
- Excellent creep resistance, elastic recovery
- Good abrasion and wear resistance
- Highly resistant to hydrocarbons & other fluids
- Excellent colorability and aesthetic properties
- Easy processing and total system costs reduction
- Easy to recycle and reuse

Available Grades

- Flame retardant
- UV stabilized
- Heat stabilized
- Suitability for food contact
- Special and premium control grades for medical application
- Foamable grades

Processing

- Blow molding
- Extrusion
- Injection molding
- Gas injection molding
- Rotomolding
- Thermoforming

Hytrel® TPC ECO-B

Hytrel® ECO-B resin grades are drop in place solutions; no product requalification required.

Hytrel® TPC RS – segregated bio content

Hytrel® TPC RS grades are drop in place solutions; no product requalification required.

ETHYLENE ACRYLIC ELASTOMER

AEM
(ETHYLENE ACRYLIC ELASTOMER)

Compounds containing Ethylene Acrylic Elastomer (AEM) offer an excellent combination of temperature (high and low) and chemical resistance, along with exceptional compressive stress relaxation. AEM is formulated and processed by customers to meet their own specific performance requirements. It is available in a broad range of formulations to support multiple types of plastics processing.

Vamac® AEM

Vamac® AEM can improve performance for a wide range of specification targets. This often starts with customized formulations and expands to accommodate customers' proprietary compounds.

Vamac® Ethylene Acrylic Elastomers (AEM) can be made into cured compounds that have excellent resistance to high temperatures and good resistance to automotive fluids such as transmission fluids, engine oils, coolants, acidic condensates, urea solution, greases and new E-fluids.

Product Benefits of Vamac® AEM

- Temperature range: - 40°C to +175°C (and up to +190°C for HyPR 5000 series)
- Very good resistance to new fluids for electric vehicles
- Good resistance to water-based coolants
- Outstanding ozone/weather resistance
- Excellent compression set and Compressive Stress Relaxation (CSR) resistance
- Good flex fatigue resistance
- Vibration damping consistency
- Halogen-free, non-toxic and low-smoke density emissions
- Excellent bonding to metal and other substrates
- Insulating or conductive compounds
- Electrical & electronics friendly

Available Grades

- Fuel resistant
- Heat resistant
- Hydrolysis resistant

Processing

- Injection molding
- Extrusion
- Compounding

Clarifoil® Cellulosic Film

Clarifoil® Cellulosic Film, are an excellent alternative to traditional petroleum-based plastic films commonly used today. Celanese film is produced using a precision casting process that provides excellent optical clarity, gauge control, and a wide range of film thicknesses and surface finishes available for customers. Clarifoil® film also has very unique vapor permeability properties that are excellent for delivering moisture control for a wide range of applications including food packaging for sensitive bakery products and anti-fog performance for upright freezer doors.

Product Benefits of Clarifoil® Cellulose Acetate Film

- Bio-Based Material (non-food source)
- Biodegradable
- Home & Industrial Compostable
- US FDA and EU Approved For Direct Food Contact
- Colorable (Translucent or Opaque)
- Liquid, Oil, and Grease Resistant
- Scratch Resistant
- Natural Transparency & Excellent Clarity
- Controlled tear for "Easy Open" Flexible Packaging
- Breathable Films (Water Vapor & Oxygen)
- Gloss & Matte Film Finishes Available
- Low Haze Films With Superior Optical Properties
- Flame Retardant Film Available

Available Grades

- Standard films
- High-slip print lamination films
- Anti-Fog films
- Ultra destructible film
- Flame retardant film
- Tape films

Processing

- Lamination (film to film, film to paperboard, film to glass)
- Printing, glueing, foil stamping and embossing

CELLULOSIC FILM

Since the 1930's, Celanese has been a major producer of Cellulose Acetate, a cellulosic material which is both bio-based and biodegradable. Clarifoil® branded products leverage this core material technology.

SUSTAINABLE CREDENTIALS

Celanese Clarifoil® films are made with sustainably sourced, certified wood pulp[1], and are Certified Bio-based[2], Water Biodegradeable[3], and Home[4] and Industrial[5] Compostable.

1 Certified by PEFC (Programme for the Endorsement of Forest Certification) or FSC (Forest Stewardship Council)
2 USDA certified Bio-based and DIN-Geprüft certified Bio-based 50-85% (Based on Cellulose Acetate Flake)
3 TUV OK Biodegradable Water certified
4 TUV OK Compost Home certified (film up to 116 microns)
5 BPI Industrial Compostability certified (film up to 95 microns) and Din Certco Industrial Compostability certified (film up to 116 microns)

LFRT
(LONG FIBER REINFORCED THERMOPLASTIC)

For excellent mechanical properties, impact and creep resistance and low warpage for metal replacement applications.

Celstran® 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. Celstran® LFRT also provides added benefits to the environment, since products within this line are also recyclable because of their high fiber lengths.

Celstran® LFRT PP ECO-B

Celstran® LFRT PP ECO-B grades are drop in place solutions; no product requalification required (availability planned for Q1 24).

Product Benefits of Celstran® LFRT

- High dimensional stability
- Excellent mechanical properties
- High energy absorption
- Meets typical crash requirements
- Retention of properties such as impact resistance, rigidity and strength over a wide temperature range
- High heat distortion temperature
- Low creep, low warpage and shrinkage

Available Grades

- Matrix materials: PP & PA (additional upon request)
- Glass fiber/glass bead reinforced
- Carbon fiber reinforced
- Aramid fiber reinforced
- High-impact modified grades
- Low-emission grades

Processing

- Injection molding
- Improved appearance grades
- Electrically conductive grades

Product Benefits of 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

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.

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.

TRIBOLOGICAL POLYMERS

(SlideX®)

Celanese tribology products 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 external lubricants are also in demand. Low-dust and no-dust materials are critical for most manufacturers whether they produce food, electronics, sports equipment or medical supplies.

Celanese tribology solutions provide most comprehensive low-wear, low-friction and low-noise product portfolio in the industry.

Product Benefits of 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 +179%
- Mixed HB/GF grades, an impact from +20% to +218%

Processing

- Injection molding
- Additional processing conditions available

Product Benefits of Tribological Polymers (SlideX®)

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

Product Benefits of Fortron® PPS ICE

- 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

Processing

- Injection molding

Product Benefits of Fortron® PPS Flex

- Continuous use temperature range is -40°C up till 165°C/180°C
- Broad chemical resistance
- Higher Flexibility (60% lower modulus)
- Increase in elongation
- Improved impact strength

Product Properties of Fortron® PPS FX

- Good heat stability up to 220°C
- Improved impact properties
- Higher viscosity

IMPROVED CRYSTALLIZATION EVOLUTION POLYMERS

Fortron® PPS ICE

Fortron® PPS ICE polymers have material properties that are equivalent to or better than standard injection molding grades and significantly improve processing characteristics.

Fortron® PPS ICE grades can help customers stay competitive by reducing cycle times and overall production costs, as well as improve flatness and enable easier demolding.

FLEXIBLE PPS AND TOUGHENED GRADES

Fortron® PPS Flex and and Fortron® PPS FX

Fortron® PPS Flex are new grades with a unique combination of flexibility while maintaining excellent high temperature, permeation and chemical resistance. Toughened grades like Fortron® PPS Flex provide improved impact properties over standard grades, while maintaining chemical resistance and temperature performance

These new grades could be considered when the application temperature challenges other flexible polymers like PE, Polyamides, and PVDF or when the application calls for thermal shock resistance, or less stiffness than standard filled PPS products.

MICROMAX™

Push the boundaries of design and scale for high-performance electronics

Micromax™ Electronic Inks and Pastes have been collaborating and developing electronic inks for the printed electronics industry for more than 60 years. Micromax™ Electronic Inks and Paste is a leading brand of printable, stretchable and moldable functional thick film inks, pastes and ceramic tapes and are utilized for circuitry, interconnection and packaging of electronic devices in automotive, passive components, telecom, consumer electronics, healthcare and military applications featuring properties, such as enhanced circuit density, improved thermal management, higher reliability and other critical functionality.

Extensive portfolio of material systems with high reliability and versatility

Hybrid Circuits

- Thick film resistors
- Laser-structurable pastes
- Conductives for hybrid circuits
- Dielectric and encapsulant materials

Passive Components

- Screen-printed resistives
- Terminations and electrodes for capacitors
- Thick film multilayer capacitors

Low-Temperature Co-fired Ceramics (LTCC)

- GreenTape™ Ceramic Tapes

Printed Electronics

- Flexible & Stretchable Printing Inks
- Low Temperature & Digital Printing Inks
- Material for self-limiting heaters
- Touch Panels/Smart glass
- Membrane Switches and Interconnects
- Biomedical device materials
- Printed Circuit Boards
- Force Sensing Resistors
- Smart Packaging & RFID/NFC
- Stretchable ink for wearable electronics

Helping customers achieve their goals across various industries

- Passives
- Telecom
- Automotive
- Healthcare/Wearables
- Advanced Packaging
- Consumer Electronics
- High Reliability

MICROMAX™ Electronic Inks and Pastes

Celanese

The chemistry inside innovation™

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