SOLUTION SHOWCASE

Celanese

OPTIMIZE ROBOT PERFORMANCE WITH ENGINEERING POLYMERS

From industrial automation and collaborative applications to the mobile intelligence of AMR and AGV technology, robots are redefining manufacturing, logistics, and life. The level of innovation in this industry seems to know no limits. Celanese elevates this innovation with our forward-looking polymer solutions coupled with design and processing expertise.

CELANESE PERFORMANCE PLASTICS

- Add high-value functional properties
- Increase durability and extend useful life
- Simplify processing and reduce total weight
- Reduce risk of failure
- Enhance sustainability

WHERE MATERIALS SCIENCE MEETS ROBOTIC INNOVATION

Choose from the broad portfolio of tested, trusted Celanese plastics that optimize robotics parts and processes. Read on to explore top robotics applications, including:

- **Electrical and electronic** connectors, sensors, electronic components, and insulators
- **Cable and tubing** dress packs, drag chains, cable insulation and jacketing; vacuum, pneumatic, and hydraulic components
- **Structural components** such as wheel drive gears and gear sets, structural parts and metal replacement, as well as bearing cages and grippers
- **Other essential components** including battery and charging modules, bumpers, housing, dampers, wheels, casters, and non-pneumatic tires (NPTs)

SUPPORTING YOUR SUCCESS

Celanese provides solutions for engineering and production challenges. We understand that getting it right, right away matters to your reputation and your bottom line. Engage us for support with robotics:

- Material selection and material data
- Part design review and optimization through FEA analysis
- Processing support and optimization through molding simulation
- Material sampling
- Prototyping and testing

ELECTRICAL AND ELECTRONIC APPLICATIONS

	Celanese Materials	Properties
Connectors	Crastin® PBT Zytel® PA	• **Excellent electrical properties** • **NH-FR V0 flame retardancy** • **Superior flowability** • Excellent toughness and stiffness • High heat and hydrolysis resistance
Sensors for laser scanner, radar, and camera	Crastin® PBT Zytel® PA	• **Dimensional stability and low warpage** • **Superior electrical, EMI shielding, and RF properties** • **Laser weldable and laser markable** • Thermally conductive material grades • High rigidity and impact strength
Electronic Components and Insulation	Crastin® PBT Rynite® PET Zytel® PA	• **NH-FR V0 flame retardancy** • **Excellent CTI, GWFI, and RTI performance** • **Resistant to electrochemical corrosion** • Excellent electrical properties • Encapsulation compatible and EIS registered

CABLE AND TUBING APPLICATIONS

	Celanese Materials	Properties
Dress Packs and Drag Chains	Hytrel® TPC-ET Zytel® PA	• **Outstanding flex fatigue performance** • **Excellent oil and heat resistance** • **High strength, low wear and friction (chains)** • NH-FR flame retardancy
Cable Insulation and Jacketing	Hytrel® TPC-ET Vamac® AEM	• **Excellent flexural fatigue and torsional strength** • **Outstanding oil, abrasion, and weather resistance** • **Non-migratory (no plasticizer), RoHS compliant** • NH-FR V0 flame retardancy • Wide working temperature range • Easy processing
Vacuum, Pneumatic, and Hydraulic Components	Hytrel® TPC-ET Zytel® LCPA	• **Excellent burst pressure** • **Good snapback performance** • Superior chemical, wear, and abrasion resistance • Excellent flexural fatigue strength • Maintained flexibility at low temperatures

STRUCTURAL COMPONENT APPLICATIONS

	Celanese Materials	Properties
Wheel Drive Gears and Gear Sets	Zytel® PA Zytel® HTN	• **High strength and stiffness without reinforcement** • **Excellent fatigue and creep resistance** • **Low wear and friction** • Excellent dimensional stability, low moisture pickup • Noise reduction
Structural Parts and Metal Replacement	Zytel® PA Zytel® HTN	• **Outstanding strength and specific stiffness** • **Excellent dimensional stability and low warpage** • **High-impact, toughened grades** • Good surface finish • High-temperature resistance • Easy processing and high flow
Bearing Cages	Zytel® PA Zytel® HTN	• **Excellent balance of strength and flexibility** • **High heat and chemical resistance** • Excellent stiffness and dimensional stability • Low wear and friction • Noise reduction

OTHER ESSENTIAL COMPONENTS

	Celanese Materials	Properties
Battery and Charging Modules	Crastin® PBT Zytel® PA Zytel® HTN	• **Excellent electrical and mechanical properties** • **NH-FR V0 flame retardancy** • **Electrically friendly heat stabilization** • Good dimensional stability and easy processing • Thermal shock and heat resistance
Bumper, Housing, and Dampers	Hytrel® TPC-ET Zytel® PA	• **Outstanding damping and impact properties** • **Excellent low temperature flexibility and toughness** • Easy processing for complex designs • Good dimensional stability • Good surface finish
Wheels, Casters, and NPTs	Hytrel® TPC-ET Zytel® PA	• **Outstanding creep and flex fatigue performance** • **Excellent low-temperature flexibility and toughness** • High flow and over-molding compatible • Broad service temperature (-40°C to 150°C) • Wide range of hardness and softness

ABOUT CELANESE MATERIALS

Zytel® PA	This versatile polyamide supports a wide range of structural, electrical, and high-temperature applications.
Zytel® HTN	Our PPA polyamide excels in extremely high-temperature structural applications that require superior stiffness and stable dimensions. It's also an effective electrical insulator.
Zytel® LCPA	This flexible polymer material offers excellent thermal, chemical, and hydrolysis resistance. The Zytel® LCPA line also includes one of the industry's widest arrays of innovative, renewably sourced (RS) materials.
Hytrel® TPC-ET	These proven TPC-ET thermoplastic elastomers combine the flexibility of rubber with the strength and processability of thermoplastics. Manufacturers prefer parts made with Hytrel® TPC-ET for their resilience, heat and chemical resistance, as well as their strength and durability.
Crastin® PBT	The properties of our PBT solutions enable easy-to-process connectors with superior flame retardancy and electrical properties as well as outstanding hydrolysis resistance.
Rynite® PET	Our PET is ideal for electronic and electrical components that require high-temperature resistance. Rynite® PET PCR non-halogen, flame retardant solutions made from post-consumer recyclate, exhibit high flow and low warpage properties while also helping manufacturers meet their sustainability targets.
Vamac® AEM	Ethylene acrylic elastomer provides excellent resistance to heat, chemicals, and abrasion in wire and cable applications.

COLLABORATION ON ROBOTICS DESIGN AND MANUFACTURING

Our team of experienced engineers, designers, and material scientists collaborate with you to select, test, and optimize the materials for your robotic applications. We bring expertise and global reach to your projects. Explore more at celanese.com.

Celanese

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