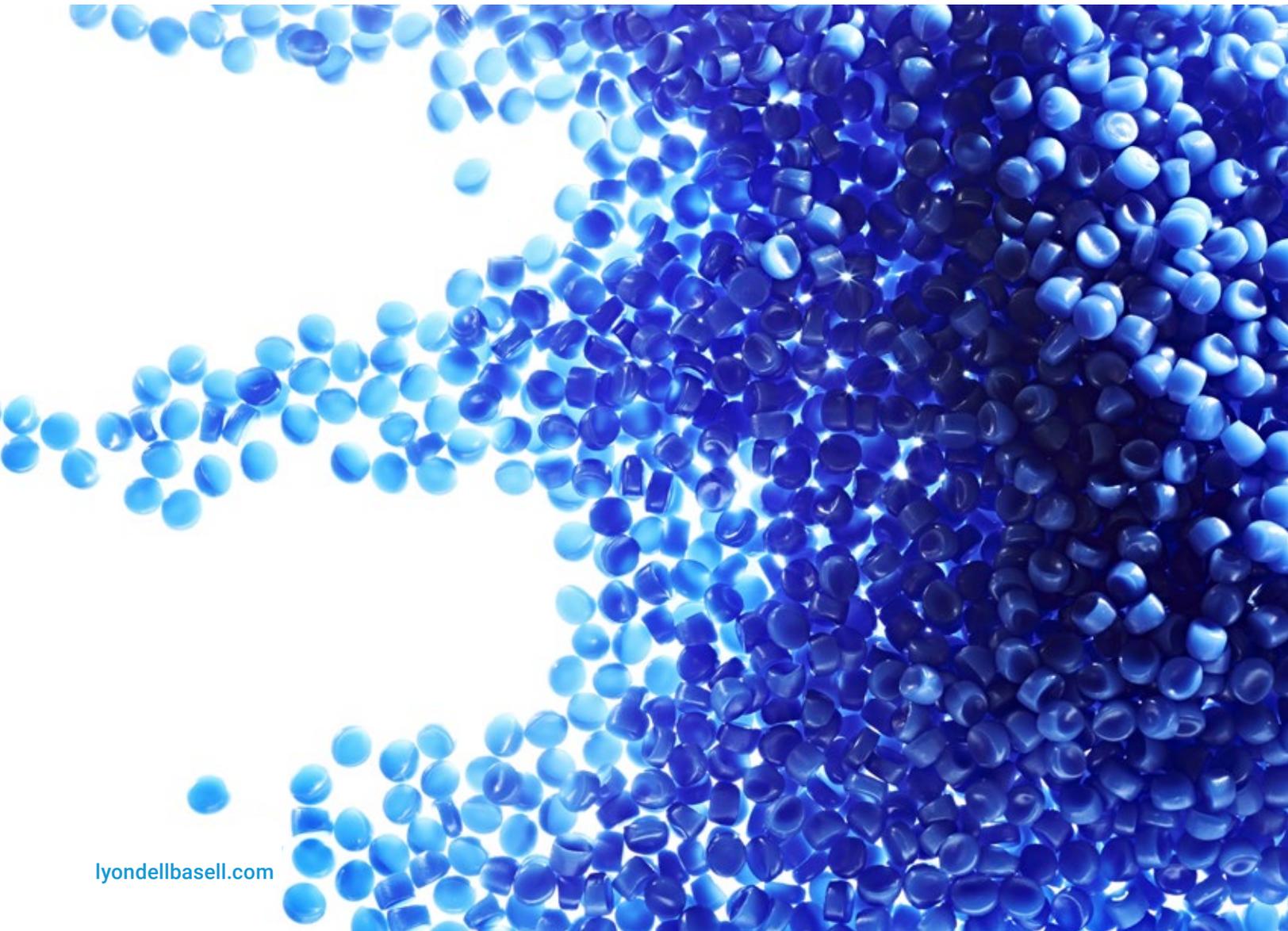


Product Portfolio Overview

Focus: Polymers





ABOUT US

We are LyondellBasell – a leader in the global chemical industry creating solutions for everyday sustainable living. Through advanced technology and focused investments, we are enabling a circular and low carbon economy. Across all we do, we aim to unlock value for our customers, investors and society. As one of the world's largest producers of polymers and a leader in polyolefin technologies, we develop, manufacture and market high-quality and innovative products for applications ranging from sustainable transportation and food safety to clean water and quality healthcare.

For more information, please visit www.lyondellbasell.com or follow @LyondellBasell on LinkedIn

Our Key Product Areas

The LyondellBasell team is inspired by the power of possibility. We are passionate about the role we play in supporting our customers' efforts to develop products to meet the challenges of today while advancing innovations that will improve tomorrow. To do so, LyondellBasell develops products and solutions in **five key areas**



<h2>POLYMERS</h2> <p>Our versatile plastic resins are used to create a variety of products including:</p> <ul style="list-style-type: none"> rigid and flexible packaging textiles wire and cable automotive appliances healthcare piping 	<h2>ADVANCED POLYMERS</h2> <p>Our diverse portfolio is used to create customizable products including:</p> <ul style="list-style-type: none"> automotive parts differentiated packaging electronics/appliances building and construction materials oil field services aerospace pipe agriculture gelcoats 	<h2>CHEMICALS</h2> <p>We produce the chemical building blocks for:</p> <ul style="list-style-type: none"> automotive fluids furniture / household goods coatings / adhesives / cleaners cosmetics / personal care products 	<h2>FUELS</h2> <p>Our refinery in the U.S. produces:</p> <ul style="list-style-type: none"> gasoline / fuel components low-sulfur diesel jet fuel lubricants oxyfuels 	<h2>TECHNOLOGIES</h2> <p>We license our state-of-the-art manufacturing and process technologies</p>
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Our materials and technologies are advancing solutions in:



Food safety & access

Food packaging and films that improve freshness, portability and extend shelf-life



Sustainable & modern living

Materials that form components used in solar panels, wind turbines, children's toys, cosmetics, leak- and shatter-proof containers.



Vehicle emissions & fuel efficiency

Stronger, lighter plastics support increased fuel efficiency and fuel additives that reduce tailpipe emissions



Quality healthcare

Essential medical supplies such as surgical face masks, hand sanitizers, biohazard bags and pill coatings



Clean water

Stronger, longer-lasting pipes used in municipal water systems and key elements used in water filtration systems



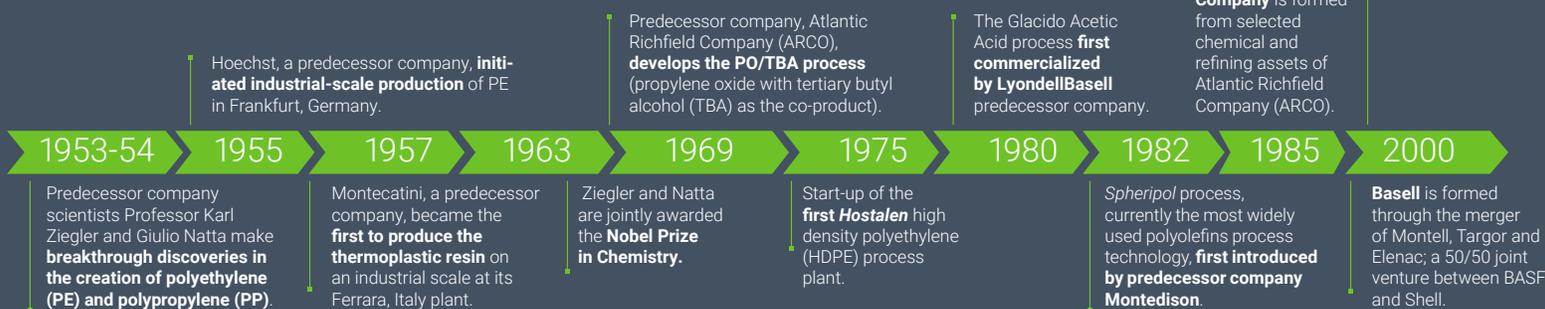
Agricultural efficiency

Lighter machinery, crop protection and soil conditioning used to be more efficient in agro-processing

Global Presence



A LEGACY OF INNOVATION AND LEADERSHIP



EUROPE

- Belgium
- France
- Germany
- Italy
- The Netherlands
- Rotterdam
- Poland
- Spain
- Sweden
- United Kingdom
- London

MIDDLE EAST

- Saudi Arabia
- Turkey
- United Arab Emirates
- Dubai

ASIA PACIFIC

- Australia
- China
- Hong Kong
- Shanghai
- India
- Indonesia
- Malaysia
- South Korea
- Thailand

Legend

- Regional Headquarters / Offices
- Manufacturing
- Research / Technical Centers
- Joint Ventures

2001	2007	2010	2014	2017	2018	2019	2020	2022	2023
<p>Basell completes start-up of the world's largest low density polyethylene plant (LDPE) in Berre, France, with a single line capacity of 320,000 tons per year.</p>	<p>Basell acquires Lyondell to become LyondellBasell Industries - one of the world's largest polymers, chemicals and fuels companies.</p>	<p>LyondellBasell listed on the NYSE (Ticker symbol: LYB).</p>	<p>LyondellBasell is named 'Responsible Care Company of the Year' by the American Chemistry Council.</p>	<p>LyondellBasell began construction of new Hyperzone HDPE plant in La Porte, Texas utilizing the company's new proprietary technology.</p>	<p>LyondellBasell finalizes acquisition of A. Schulman Inc., creating the industry's largest compounding business.</p>	<p>LyondellBasell enters into joint venture with SUEZ to operate Quality Circular Polymers (QCP), a high standard plastics recycling company in Sittard-Geleen, Netherlands.</p>	<p>LyondellBasell launches Circulen family of sustainable solutions.</p>	<p>LyondellBasell named to FORTUNE magazine's "World's Most Admired Companies" for the fourth consecutive year.</p>	<p>LyondellBasell named to the FTSE4Good Index</p>
<p>LyondellBasell launches new company strategy</p>									

Polymers at a Glance

LyondellBasell Portfolio

LyondellBasell produces versatile polymers and advanced polymers. These materials produce a variety of products that are used to advance solutions in nearly every sector of the economy.



Polymers

LyondellBasell is one of the world's largest producers of ethylene and propylene, base for versatile plastic resins, such as polypropylene and polyethylene.

Key Advantages

Cutting edge and differentiated polymer product portfolio.

Advancing solutions in nearly every sector of the economy, including automotive, renewable energy technologies, packaging, piping, textiles and healthcare.

Selected Products

HDPE
LDPE
LLDPE
Tie Layers
Homopolymers PP
Impact Copolymers PP
Random Copolymers PP
Catalloy Process Resins
Polybutene-1

End Uses

- Rigid and flexible packaging
- Textiles
- Wire and Cable
- Automotive
- Appliances
- Healthcare
- Piping



Advanced Polymers

LyondellBasell offers a full product portfolio of masterbatch solutions, engineering plastics, engineered composites, specialty powders, PP compounds, custom performance colors. Our high-performance resins and plastics compounds are used as raw materials in a variety of markets.

Key Advantages

Vertically integrated global manufacturer - end to end customer solutions - expanded reach into growing markets - scalable growth platforms - focused innovation.

Selected Products

Polypropylene Compounds
Masterbatches
Color Concentrates
Specialty Powders
Engineered Polymers
Engineered Composites

End Uses

- Automotive parts
- Differentiated packaging
- Electronics / Appliances
- Oil field services
- Building and construction materials
- Aerospace
- Pipe
- Agriculture



Polymers Overview

LyondellBasell is a leading worldwide producer of polyethylene and polypropylene. Our polymers are used in extrusion, blow molding and injection molding processes for a wide variety of end markets including food and beverage packaging, construction, wire and cable, healthcare and automotive markets.

Key Advantages

- Products used in a broad range of applications and in products that people use every day with increasing demand in developing markets
- Operate multiple major integrated olefin and olefin derivative sites, which provide cost efficiencies through economies of scale and optimization
- U.S. access to shale gas, low cost NGLs, and the ability to process NGLs up to 90 percent of ethylene production
- Feedstock advantaged joint ventures and differentiated premium grade polyolefin products



Hyperzone PE technology produces HDPE that enables our customers to obtain an optimal balance between ease of processing and high performance end-product physical properties.

Selected Products

■ POLYETHYLENE:

– **High-density polyethylene:** Thermoplastic materials made from the polymerization of ethylene in gas phase, slurry or solution reactors. Polymerization takes place under low-pressure conditions with the support of catalysts. HDPE is characterized by a linear polymer chain with few branches, and contains smaller amounts of comonomers such as butene, hexene or octene. These resins are used in a variety of processing techniques such as extrusion, extrusion blow molding, injection and rotational molding. HDPE is used in applications such as pipe, plastic fuel tanks, industrial packaging, bottles, healthcare articles, containers, toys, films, tapes and fibers.

Highlighted Product Brands: *Alathon* (Global), *Hostalen* (Global), *Hyperzone* (Global), *Luflexen* (Europe), *Lupolen* (Global), *Microthene* (Global), *Petrothene* (Global), *Plexar* (Global), *Purell* (Europe)

– **Low-density polyethylene:** Thermoplastics made from the polymerization of ethylene at very high pressures. High-pressure polymerization produces unlike low-pressure polymerization technologies, high-pressure polymerization produces highly-branched polymer structures and allows the co-polymerization of ethylene with polar comonomers. LDPE is a versatile polymer offering an excellent balance of properties including good melt strength, flexibility, and excellent optics, making it suited for a number of applications such as film, healthcare and wire & cable.

Highlighted Product Brands: *Lucafen* (Global), *Microthene* (Global), *Petrothene* (Global), *Lupolen* (Europe), *Plexar* (Global), *Purell* (Global), *Ulthathene* (Global)

– **Linear low-density polyethylene:** LLDPE resins are thermoplastic materials made by the polymerization of ethylene in presence of alpha-olefinic comonomers in low-pressure Catalytic processes. LLDPE Materials are characterized by their linear structures. In combination with their high flexibility these products are used in a variety of processing techniques, like film, molding, rotational molding and compounding.

Highlighted Product Brands: *Microthene* (Global), *Petrothene* (Global), *Plexar* (Global)

– **Tie Layers:** *Plexar* brand provides excellent adhesion to ethylene vinyl alcohol (EVOH), polyamide (nylon), PET and polyolefins. They are used in multilayer structures to bond dissimilar polymers together. *Plexar* resins provide superior performance in coextrusion applications such as blown and cast film, extrusion coating, blow molding, sheet extrusion, wire and cable technology, and in other industrial bonding applications.

Highlighted Product Brands: *Plexar* (Global)

■ POLYBUTENE-1

High molecular weight isotactic, semi-crystalline thermoplastic polyolefins produced through the polymerization of butene-1 and ethylene.

Highlighted Product Brands: *Koattro* (Global), *Toppyl* (Global), *Akoalit* (Global), *Akoafloor* (Global)

■ POLYPROPYLENE:

– **Homopolymers:** Thermoplastic resins produced of propylene and can be used in processing technologies such as injection molding, film, fiber, sheet extrusion and thermoforming where stiffness and temperature resistance are relevant. They provide a broad set of properties to meet the market needs in packaging, household goods, textiles, film, healthcare and pipe as well as applications in the automotive and electrical industries.

Highlighted Product Brands: *Adstif* (Global), *Metocene* (Global), *Moplen* (Europe and Asia), *Profax* (Americas), *Purell* (Europe and Asia)

– **Impact Copolymers:** Thermoplastic resins produced through the polymerization of propylene and ethylene or or butylene. They provide high impact properties and are used in applications such as packaging, houseware, film, and pipe applications, as well as in the automotive and electrical segments.

Highlighted Product Brands: *Hostalen* (Europe), *Profax* (Americas), *Purell* (Europe and Asia)

– **Random Copolymers:** Thermoplastic resins produced through the polymerization of propylene, with ethylene, butene or hexene bonds introduced in the polymer chain. They are used in a wide range of applications, such as high clarity/transparency packaging, injection molding, blow molding, cast, BOPP and blown film, pipe and thermoforming. They provide numerous benefits including very good transparency and gloss, broad range of melting points and seal initiation temperature (SIT), very good aesthetic characteristics, and the best radiation resistance amongst polypropylene resin types.

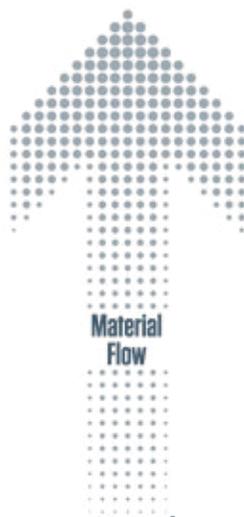
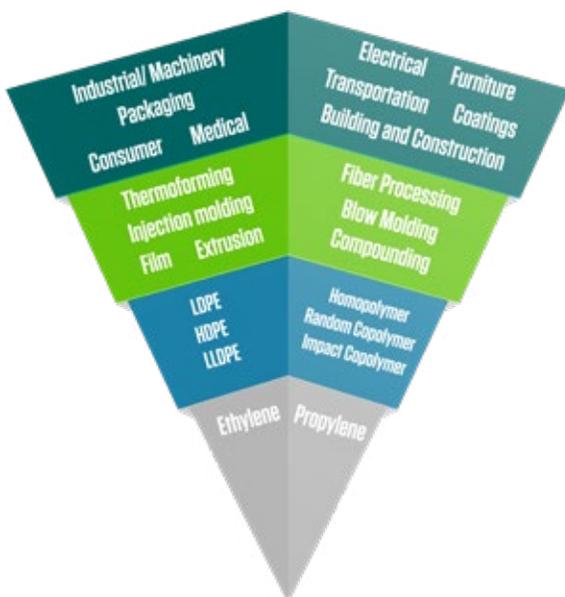
Highlighted Product Brands: *Moplen* (Europe and Asia), *Profax* (Americas), *Purell* (Europe and Asia)

■ CATALLOY Process Resins

A technology creating reactor thermoplastic polyolefins that combine the advantages of polyolefins with those of elastomers.

Highlighted Product Brands: *Hifax* (Global), *Softell* (Global), *Adsyl* (Global), *Adflex* (Global)

Material to End Market



Advanced Polymers Overview

LyondellBasell is a leading supplier of high-performance plastics compounds and resins offering a full portfolio of masterbatch solutions, engineering plastics, engineered composites, specialty powders, PP compounds, custom performance colors. We offer this product portfolio on a global scale and in a wide range of markets, ranging from automotive, electrical, building and construction, pipe, oil and gas, to agriculture and packaging.

LyondellBasell's rich product portfolio and deep market understanding allows for innovative custom solutions to ensure our customers succeed in the market place.

Key Advantages

- Vertically integrated global manufacturer
- End-to-end customer solutions
- Expanded reach into growing markets
- Scalable growth platform
- Focused innovation



Selected Products

Color Concentrates

Offering a wide color portfolio paired with custom color matching for your most challenging color applications

Highlighted Product Brands: *Polybatch* (Global), *Polycycle* (Europe), *Cord-o-bond* (Americas)

Engineered Composites

A diverse thermoset portfolio of BMC, SMC, TMC and our Quantum Engineered Structural Composites for industrial to niche markets

Highlighted Product Brands: *Dura-BMC*, *Premi-SMC* and *Quantum-ESC* (Global)

Engineered Polymers

Specializing in the design and manufacture of high-performance plastic compounds and resins to meet demanding applications and colors

Highlighted Product Brands: *Schulamid* (Global), *Schuladur* (Europe), *Ronfalin* (Europe)

Masterbatches

Enhanced additive concentrates that improve the appearance and performance of resins across many processes

Highlighted Product Brands: *Polybatch* (Global), *Polywhite* (Global), *Polyblak* (Global)

Polypropylene Compounds

Thermoplastic resins produced using base polyolefins with various components like fillers and reinforcements, and pigments and additives

Highlighted Product Brands: *Hostacom* (Global), *Hifax* (Global), *Softell* (Global)

Specialty Powders

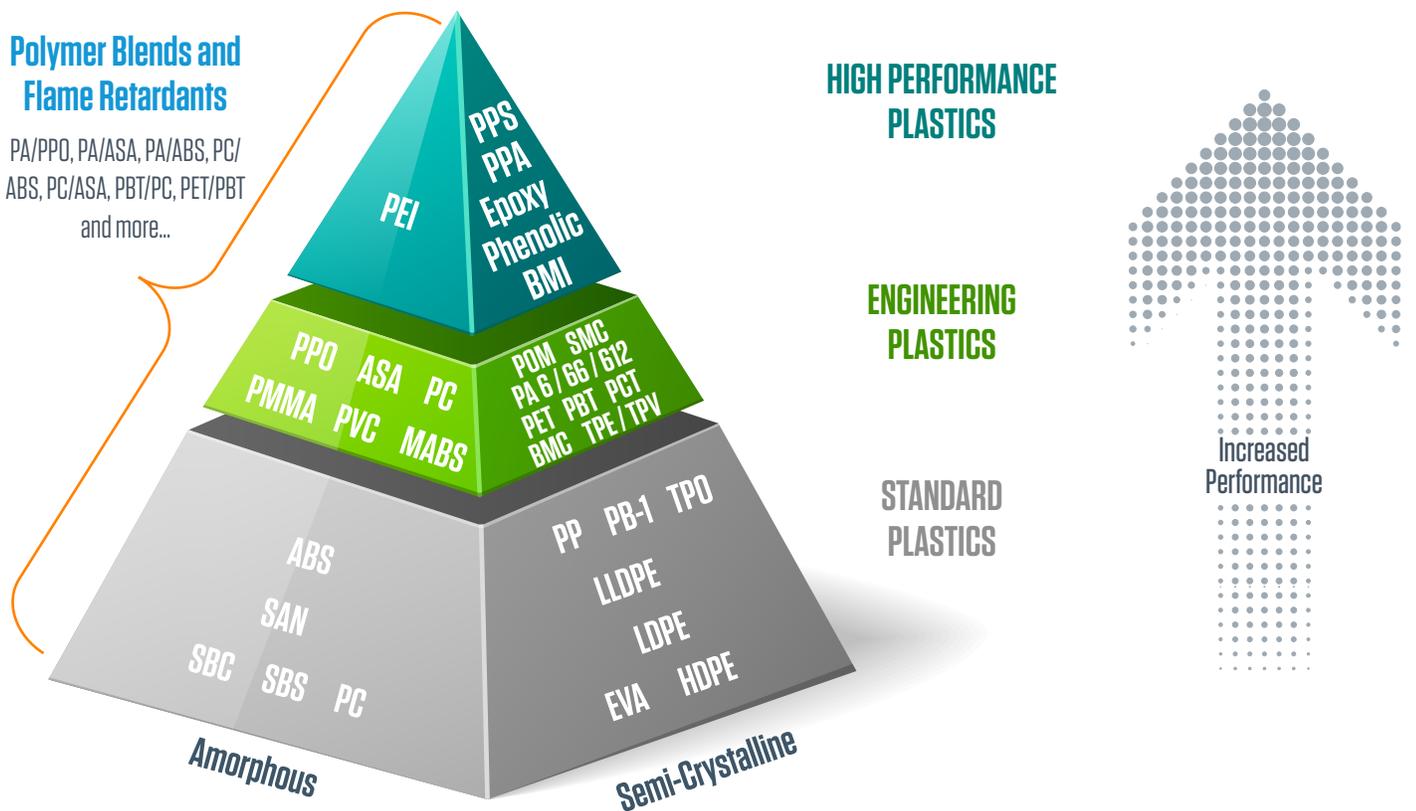
Size reduction technology to deliver powders to suit many markets and applications such as Oil & Gas and Rotomolding

Highlighted Product Brands: *Icorene* (Global)

Advanced Polymers - Technology Overview

Polymer Blends and Flame Retardants

PA/PPO, PA/ASA, PA/ABS, PC/ABS, PC/ASA, PBT/PC, PET/PBT and more...



Innovation + Portfolio Breadth = Best-fit products to meet application needs

Our goal: Produce and market at least 2 million metric tons of recycled and renewable-based polymers annually by 2030

Achieving this ambitious goal will require a range of actions to secure access to plastic waste feedstock and build our capacity to produce more recycled and renewable-based products. Our new Circular and Low Carbon Solutions business is focused on securing feedstock supply, growing our recycling footprint and developing scalable technologies to grow our *Circulen* portfolio of products.



CirculenRecover: Products made from plastic waste through a **mechanical recycling** process. This type of recycling upgrades plastic waste into usable materials through mechanical processes including sorting, washing, grinding, melting and forming new pellets. The resulting polymers can also be blended or compounded with traditional fossil-based products, allowing us to deliver high-quality polymers with an optimal balance of performance characteristics and mechanically-recycled content. These polymers can be used in a wide variety of industrial, household and consumer product applications.



CirculenRevive: Products made using an **advanced recycling** process to convert plastic waste back to its molecular level, which is then used as a feedstock in our conventional production processes to produce new polymers. A broad range of plastics can be recycled using this process including hard-to-recycle items such as mixed materials, composites, multilayer and flexible plastics. The advanced recycled feedstock is mixed with conventional feedstocks in our process, and allocated to *CirculenRevive* products using a mass balance approach certified according to the International Sustainability and Carbon Certification (ISCC) PLUS standard. These polymers can be used in highly regulated applications such as food contact and healthcare.



CirculenRenew: Products made from **renewable feedstocks** derived from bio-based wastes and residual oils, such as used cooking oils. These feedstocks are used in our conventional production processes along with conventional feedstocks, and are allocated to *CirculenRenew* products using an ISCC PLUS-certified mass balance approach. The use of renewable feedstocks offers a lower carbon footprint compared to fossil-based feedstocks. These polymers can also be used in highly regulated applications such as food contact and healthcare.



Other Key Product Areas



Chemicals

Our chemical offering produces and markets propylene oxide and its derivatives, oxyfuels and related products, and intermediate chemicals such as styrene monomer, acetyls, and ethylene oxide and derivatives. We are the world's second largest producer of propylene oxide and oxyfuels.

Key Advantages

Leading proprietary technologies
 Diversity and linkage of our integrated product portfolio
 Access to low cost natural gas

Selected Products

Propylene oxide
 Styrene monomer
 Propylene glycols and ethers
 Methanol and acetyls
 TBA intermediates
 Ethylene oxide
 Ethylene glycols and ethers
 Oxygenated fuels

End Uses

- Insulation
- Home furnishings
- Adhesives
- Automotive
- Consumer products
- Coatings
- Fuel additives



Fuels

Our Houston refinery is capable of refining heavy, high-sulfur crude oil into refined products including gasoline and distillates. Our significant hydrotreating and coking capacity positions us well in a market with increasingly stricter sulfur regulations.

Key Advantages

Capability to process diverse crude mix
 Strategic location on the Gulf Coast
 Capable of meeting the Tier III sulfur specification

Selected Products

Gasoline
 Ultra low-sulfur diesel
 Jet fuel
 Aromatics

End Uses

- Automotive fuels
- Aviation fuels
- Heating oil
- Oils



Technology

Our Technology segment develops and licenses chemical and polyolefin process technologies and manufactures and sells polyolefin catalysts. More than 280 polyolefin lines around the world utilize LyondellBasell-licensed technology representing more than 50 million tons of annual production capacity.

Key Advantages

Industry leading polyolefin process technologies
 Leading portfolio of polyolefin catalysts

Selected Products

Process licensing
 Catalysts sales
 Technology services

End Uses

- Polyolefin and chemical manufacturers

Market Overview

Oil Field Services

Our products are used in a wide range of on shore and off shore services include diversion and fracking technologies from specialty powders to structural components requiring high heat and pressure resistance including frack plugs, frack balls, centralizers, pipe spacers thermal insulation pipe liners and buoyancy solutions.

Aerospace

Our carbon fiber and fiberglass-reinforced vinyl ester, epoxy and phenolic materials are used for secondary and interior aircraft structures which are lightweight and have flame retardant properties.

Renewable Energy Technologies

Our products make coatings for wind turbines that reduce drag and extend blade life, and create wire and cable casings that conduct power and secure solar panels. Our products also enhance through bi-polar plate technology energy storage and transfer in back flow batteries and fuel cells.

Packaging

Our food packaging products make plastic films, and rigid and flexible thin packaging to keep food safe and fresh for longer, reducing food waste. Our products for industrial packaging with their excellent property profiles make jerry cans, drums and IBCs safe for the transport of goods by road, rail, sea and air to protect filling as well as our environment.

Healthcare

Our products are used in gloves, syringes, IV bags, hand sanitizer and medicine packaging, ensuring sterile and sanitized supplies, as well as in structural applications involving prosthetic feet and medical cots.



Agriculture

Our products make irrigation more efficient, reducing water leakage. They are also used for greenhouse structures and stretch wrap packaging. Our fiberglass-reinforced product range improves safety and performance for heavy agricultural equipment. Our rotomolding powders provide strong, tough, durable and lightweight solutions for farming machinery.

Pipe

Our products make pipes that are lighter and more durable; making installation faster and easier, allow for safe transport of water and gas, as well as for modern solutions for plumbing, heating and cooling.

Textiles

Our products are used in a diverse set of textile applications ranging from geo-textiles which stabilize our roads to non-woven fabrics which help to keep the baby's skin dry. Offering light-weight fabrics with high loft and transmitting moisture they are used also for sanitary products.

Automotive

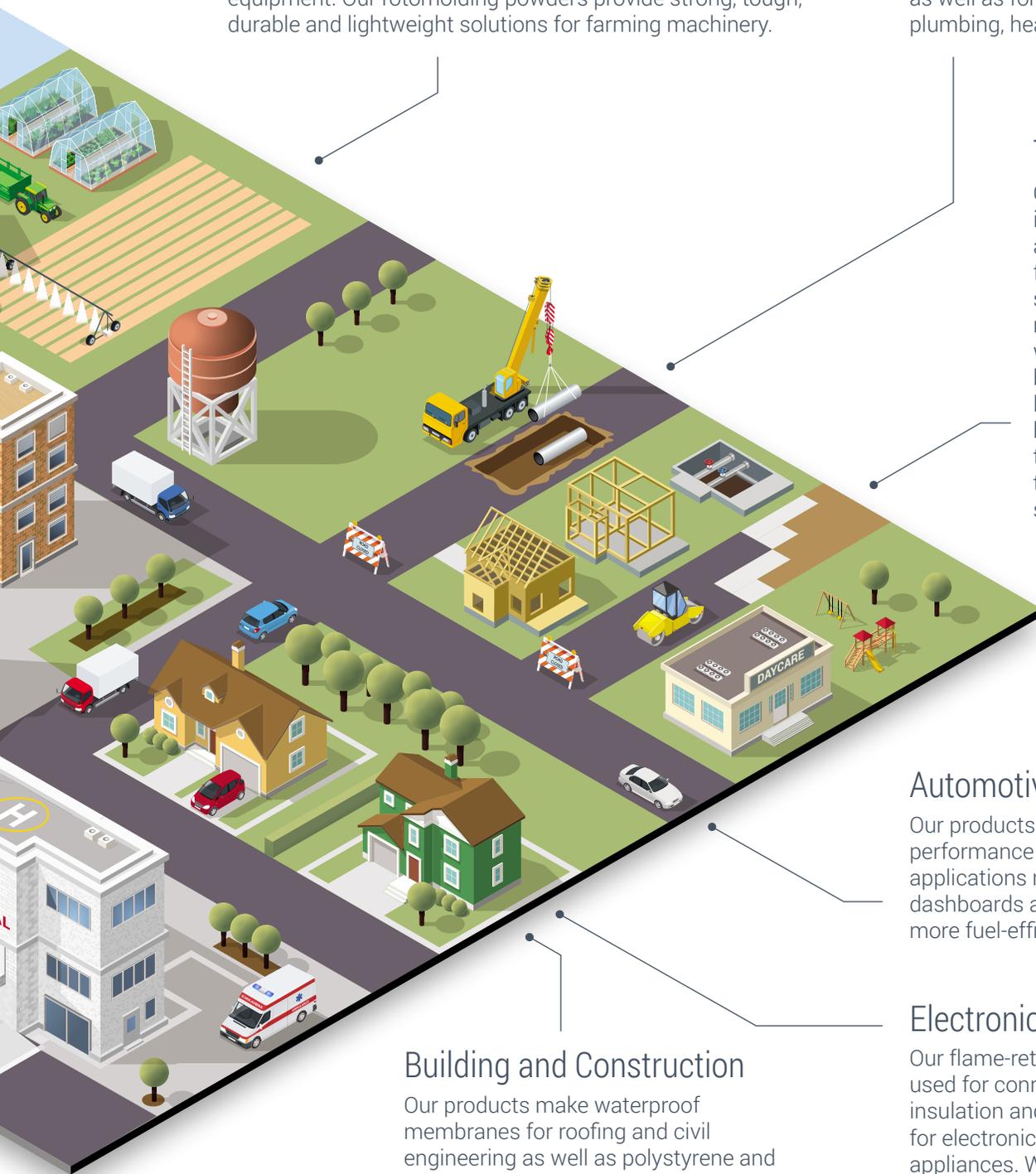
Our products are used in high performance fuel systems and applications making car bumpers, dashboards and trims lighter and more fuel-efficient.

Electronics / Appliances

Our flame-retardant products are used for connectors, in cable insulation and as protective covers for electronic components and appliances. While our polypropylene compounds create housings and fans for appliances, our engineered polymers make strong casings for power tools.

Building and Construction

Our products make waterproof membranes for roofing and civil engineering as well as polystyrene and polyurethane insulation foam for walls, roofs and floors; conserving energy for heating and cooling buildings. Our products are used in HVAC, under floor heatings, man hole covers, and various other infrastructure components.



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Users should review the applicable Safety Data Sheet before handling the product.

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