Product Portfolio Overview
Focus: Polymers
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:

- **Food safety & access**: Food packaging and films that improve freshness, portability and extend shelf-life.
- **Vehicle emissions & fuel efficiency**: Stronger, lighter plastics support increased fuel efficiency and fuel additives that reduce tailpipe emissions.
- **Clean water**: Stronger, longer-lasting pipes used in municipal water systems and key elements used in water filtration systems.
- **Sustainable & modern living**: Materials that form components used in solar panels, wind turbines, children’s toys, cosmetics, leak- and shatter-proof containers.
- **Quality healthcare**: Essential medical supplies such as surgical face masks, hand sanitizers, biohazard bags and pill coatings.
- **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

Hoechst, a predecessor company, initiated industrial-scale production of PE in Frankfurt, Germany.

Predecessor company, Atlantic Richfield Company (ARCO) develops the PO/TBA process (propylene oxide with tertiary butyl alcohol (TBA) as the co-product).

The Glacido Acetic Acid process first commercialized by LyondellBasell predecessor company.

Lyondell Chemical Company is formed from selected chemical and refining assets of Atlantic Richfield Company (ARCO).

Predecessor company scientists Professor Karl Ziegler and Giulio Natta make breakthrough discoveries in the creation of polyethylene (PE) and polypropylene (PP).

Montecatini, a predecessor company, became the first to produce the thermoplastic resin on an industrial scale at its Ferrara, Italy plant.

Ziegler and Natta are jointly awarded the Nobel Prize in Chemistry.

Start-up of the first Hostalen high density polyethylene (HDPE) process plant.

Spheripol process currently the most widely used polyolefins process technology. first introduced by predecessor company Montedison.

Basell is formed through the merger of Montell, Targor and Elenac; a 50/50 joint venture between BASF and Shell.


Note: Map data as of December 31, 2022.
Basell acquires Lyondell to become LyondellBasell Industries - one of the world’s largest polymers, chemicals and fuels companies.

LyondellBasell listed on the NYSE (Ticker symbol: LYB).

LyondellBasell began construction of new Hyperzone HDPE plant in La Porte, Texas utilizing the company’s new proprietary technology.

LyondellBasell finalizes acquisition of A. Schulman Inc., creating the industry’s largest compounding business.

LyondellBasell launches Circulen family of sustainable solutions.

LyondellBasell entered into joint venture with SUEZ to operate Quality Circular Polymers (QCP), a high standard plastics recycling company in Sittard-Geleen, Netherlands.

LyondellBasell named to FORTUNE magazine’s “World’s Most Admired Companies” for the fourth consecutive year.

LyondellBasell named to the FTSE4Good Index.

LyondellBasell Launches new company Strategy.


Legend

★ Regional Headquarters / Offices
■ Manufacturing
● Research / Technical Centers
▲ Joint Ventures
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

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:** Alaton (Global), Hostalen (Global), Hyperzone (Global), Lupolen (Europe), Microthene (Global), Petrothene (Global), Plexar (Global), Purell (Global), Ultrathene (Global)

- **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:** Microthene (Global), Petrothene (Global), Plexar (Global), Purell (Europe)

**POLYBUTENE-1**
- **Impact Copolymers:** Thermoplastic resins produced through the polymerization of propylene with 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)

**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:** Adstim (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)

**Plyra 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)
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, acetyl, and ethylene oxide and derivatives. We are the world’s second largest producer of propylene oxide and oxyfuels.

#### Selected Products
- Propylene oxide
- Styrene monomer
- Propylene glycols and ethers
- Methanol and acetyl
- TBA intermediates
- Ethylene oxide
- Ethylene glycols and ethers
- Oxygenated fuels

#### End Uses
- Insulation
- Home furnishings
- Adhesives
- Automotive

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

### 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.

#### Selected Products
- Gasoline
- Ultra low-sulfur diesel
- Jet fuel
- Aromatics

#### End Uses
- Automotive fuels
- Aviation fuels
- Heating oil
- Oils

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

### 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.

#### 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.

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.

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.

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.

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.

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.

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.

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.
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LyondellBasell prohibits or restricts the use of its products in certain applications. For further information on restrictions or prohibitions of use, please contact a LyondellBasell representative.

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

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