Pipes
Polyethylene / Polypropylene
Repsol. A global multi-energy company

**Over 8 decades of experience in the world of energy**

One of the largest energy companies worldwide and one of the biggest private oil & gas companies.

**Repsol is committed to our customers’ global strategy** putting our entire organization at their disposal to achieve a common goal: to create long-term relationships which enable us to rise to the common challenges our business presents.

**Over 90 countries where we market our products**

Repsol has a diverse workforce of over 25,000 employees, marketing products in over 90 countries and reaching 10 million customers.

Repsol’s highly integrated Chemical Division focuses its strategy on the continuous generation of value through differentiated products and services.

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Repsol Campus, Corporate Headquarters in Madrid
LEED® Platinum certificate, awarded by the prestigious U.S. Green Building Council (USGBC), for new buildings construction
Repsol manufactures a wide variety of products, ranging from base petrochemicals to derivatives.

**Base petrochemicals:** ethylene, propylene, butadiene and benzene.

**Intermediate products:** styrene, propylene oxide, polyether polyols, and propylene glycols.

**Polyolefins:** polypropylene (PP) and PP compounds, both high and low-density polyethylene (HDPE and LDPE), metallocene linear low density polyethylene (mLLDPE), ethylene vinyl acetate (EVA) and ethylene butyl acrylate (EBA) copolymers.

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**Added value**

Repsol’s Chemicals Division, with a high degree of integration, focuses its strategy in the constant generation of value through differentiated products and services.

**I+D**

Over 100 scientists and researchers working for you

Including qualified personnel specialized on Product Stewardship. Repsol’s commitment to R&D is an evidence of the company’s aim to attain business excellence to meet future horizons.
We have a **specialized circular economy department** dedicated to recycling post-consumer materials to drive development of new materials offering solutions based on innovative polyolefins with recycled content.

We use **recycled plastics in critical applications**, creating new markets for plastic waste and driving circularity by giving that waste a new use. As a result, we offer a wide range of polyolefins with recycled content that deliver excellent engineering performance.

We have circular polyolefins obtained by incorporating pyrolysis oil, from chemically recycled plastic waste not suitable for mechanical recycling, together with virgin feedstock into our petrochemical process, reducing the consumption of non-renewable resources. These **circular polyolefins** have the same properties and quality as virgin material and are therefore apt for the cable industry.

At Repsol, we believe in the circular economy, and we run specific projects that minimize the environmental impact of our materials. To this end, we are committed to making our industrial processes increasingly efficient and reducing the carbon footprint of our polymers.

We have obtained ISCC PLUS certification for circular and traceable polyolefins that use plastic waste as raw material. Moreover, our wide range of polyolefins is 100% recyclable.

Our ambition is **to recycle by 2030 the equivalent of 20% of the polyolefins we produce** to support, in conjunction with the other initiatives in Repsol’s circular economy strategy, the goal we announced in December 2019: to reach net zero emissions by 2050.

To contribute to the company’s emissions neutrality goal, **our chemicals business has launched its 3030 Plan, intended to cut our carbon intensity by 30% by 2030.**

Advancing the circular economy and lowering carbon intensity in our chemicals business will contribute towards transforming Repsol’s industrial operations, as well as developing high-value-added raw materials, making it possible to manufacture an infinite number of products that improve human well-being, safety, and quality of life while enhancing the environment.
Estimates show that with current population growth and poor water management practices, the world will face a 40% water shortage by 2030. In terms of development, water scarcity is a top global risk. The world will need to meet the development challenges of the 21st century and improve how water resources are managed.

Chemicals, and specialty plastics, are key to developing modern pipes that will ensure access to reliable water and sanitation services in tomorrow’s demanding infrastructure environments.

Repsol develops a wide range of products specifically for pipe applications. Our Technology Lab, beacon of innovation, puts progress first; this is the place where products come to life and are meticulously perfected, to the benefit of our clients. The result: a competitive advantage for both Repsol and its client base, driven by excellence in service and development.

Offering solutions in low, medium and high density polyethylene, as well as polypropylene
Our versatility allows us to produce one of the most extensive ranges of polyolefins on the market, for a wide range of segments like:

**Water, gas and irrigation pressure pipes**

These products are approved by renowned European organizations for a wide array of pressure pipe applications: PE40 in LDPE, PE80 in MDPE, bimodal HDPE and PE100.

**Sewerage, drainage and cable protection pipes**

Extensive portfolio of polyethylene and polypropylene products with varying degrees of stiffness and processability in corrugated and plain pipes. Available in all diameter ranges, depending on our customers’ requirements and the final application of the pipe.
Polyethylene and polypropylene pipes guarantee present and future needs by using natural resources to protect the environment.

Different production technologies to offer reliable, quality solutions to enhance your business:

- **Respect for the environment**
  The properties of plastic pipes, such as: flexibility, fusion joints and minimum number of accessories; allow for leakage reduction in the pipeline network, preventing water losses and spills of dangerous liquids.

- **Excellent mechanical properties**
  Autoclave and tubular for materials such as LDPE, EVA, EBA; slurry loop and bimodal for HDPE; and slurry and spheripol for PP.

- **100% recyclable of high quality**
  The material obtained from recycling can be used to manufacture new products.
### Polyethylene for transport under pressure of water, gas and irrigation

<table>
<thead>
<tr>
<th>Grade</th>
<th>Colour</th>
<th>MFI ISO 1133 (190°C) g/10'</th>
<th>Density ISO 1183 kg/m³</th>
<th>Type of polymer</th>
<th>MRS Qualification</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>T40N</td>
<td>Black</td>
<td>0.25</td>
<td>932</td>
<td>LDPE</td>
<td>PE40</td>
<td>Water transport</td>
</tr>
<tr>
<td>2202BS</td>
<td>Blue</td>
<td>0.3</td>
<td>932</td>
<td>LDPE</td>
<td>-</td>
<td>Water pressure pipe marking lines</td>
</tr>
<tr>
<td>3802</td>
<td>Natural</td>
<td>0.18</td>
<td>938</td>
<td>MDPE</td>
<td>-</td>
<td>Non-certified pressure pipe</td>
</tr>
<tr>
<td>3802N</td>
<td>Black</td>
<td>0.18</td>
<td>948</td>
<td>MDPE</td>
<td>-</td>
<td>Drip tape/irrigation tapes</td>
</tr>
<tr>
<td>T80N</td>
<td>Black</td>
<td>0.1</td>
<td>960</td>
<td>HDPE Bimodal</td>
<td>PE80</td>
<td>Non-certified pressure pipe</td>
</tr>
<tr>
<td>T100NLS</td>
<td>Black</td>
<td>-</td>
<td>962</td>
<td>HDPE Bimodal</td>
<td>PE100</td>
<td>Water and gas transport</td>
</tr>
<tr>
<td>51100BS</td>
<td>Blue</td>
<td>0.27</td>
<td>955</td>
<td>HDPE Bimodal</td>
<td>-</td>
<td>Identification stripes for water</td>
</tr>
<tr>
<td>51100YS</td>
<td>Yellow</td>
<td>0.27</td>
<td>955</td>
<td>HDPE Bimodal</td>
<td>-</td>
<td>Identification stripes for gas</td>
</tr>
<tr>
<td>51100</td>
<td>Natural</td>
<td>0.27</td>
<td>955</td>
<td>HDPE Bimodal</td>
<td>-</td>
<td>Non-certified pressure pipe</td>
</tr>
</tbody>
</table>

Repsol adds value to its customers’ businesses by reinforcing their trade opportunities with IIP, LNE and Din-Certco certifications in water and gas pressure piping.

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# Polyethylene for sewerage, drainage and cable protection

<table>
<thead>
<tr>
<th>Grade</th>
<th>Colour</th>
<th>MFI</th>
<th>Density</th>
<th>Flexural modulus</th>
<th>Type of polymer</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ISO 1133 [230ºC] g/10' Kg</td>
<td>ISO 1183 Kg/m³</td>
<td>ISO 178 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE033</td>
<td>Natural</td>
<td>0.30</td>
<td>-</td>
<td>-</td>
<td>LDPE</td>
<td>Internal layer of corrugated pipe</td>
</tr>
<tr>
<td>2202F</td>
<td>Natural</td>
<td>0.25</td>
<td>-</td>
<td>-</td>
<td>LDPE</td>
<td>Internal layer of corrugated pipe</td>
</tr>
<tr>
<td>PE034</td>
<td>Natural</td>
<td>0.30</td>
<td>-</td>
<td>-</td>
<td>LDPE</td>
<td>Internal layer of corrugated pipe</td>
</tr>
<tr>
<td>2303F</td>
<td>Natural</td>
<td>0.30</td>
<td>-</td>
<td>-</td>
<td>LDPE</td>
<td>Internal layer of corrugated pipe</td>
</tr>
<tr>
<td>TR135</td>
<td>Natural</td>
<td>0.12</td>
<td>12</td>
<td>938</td>
<td>MDPE</td>
<td>Internal layer of corrugated pipe</td>
</tr>
<tr>
<td>3802</td>
<td>Natural</td>
<td>0.18</td>
<td>0.85</td>
<td>938</td>
<td>MDPE</td>
<td>Plain pipe for cable protection</td>
</tr>
<tr>
<td>5503</td>
<td>Natural</td>
<td>0.25</td>
<td>1.1</td>
<td>955</td>
<td>HDPE</td>
<td>Corrugated pipe with good balance of processability / flexibility</td>
</tr>
<tr>
<td>5606T</td>
<td>Natural</td>
<td>0.60</td>
<td>2</td>
<td>956</td>
<td>HDPE</td>
<td>Corrugated pipe with excellent processability</td>
</tr>
<tr>
<td>CAB4910</td>
<td>Natural</td>
<td>0.90</td>
<td>-</td>
<td>949</td>
<td>HDPE Bimodal</td>
<td>Corrugated pipe with excellent processability</td>
</tr>
<tr>
<td>S803</td>
<td>Natural</td>
<td>0.25</td>
<td>1.1</td>
<td>958</td>
<td>HDPE Bimodal</td>
<td>Corrugated pipe with high rigidity</td>
</tr>
<tr>
<td>S11000</td>
<td>Natural</td>
<td>0.27</td>
<td>-</td>
<td>958</td>
<td>HDPE Bimodal</td>
<td>Corrugated pipe with very high ESCR</td>
</tr>
</tbody>
</table>

The jointing connections of polyethylene and polypropylene pipes ensure watertightness throughout. This prevents losses, leakages, infiltrations and exfiltrations in the network.

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### Polypropylene for hot and cold water transport under pressure

<table>
<thead>
<tr>
<th>Grade</th>
<th>Colour</th>
<th>MFI</th>
<th>Flexural modulus</th>
<th>Type of PP</th>
<th>MRS Qualification</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR210G4E</td>
<td>Natural</td>
<td>0.3</td>
<td>1.2</td>
<td>Random</td>
<td>PPR80</td>
<td>Pressure pipes for end user free additivation</td>
</tr>
<tr>
<td>PR210X6E</td>
<td>Natural</td>
<td>0.3</td>
<td>1.2</td>
<td>Random</td>
<td>PPR80</td>
<td>Pressure pipes with high thermal stabilization</td>
</tr>
<tr>
<td>PG331A5000</td>
<td>Natural</td>
<td>-</td>
<td>2.0</td>
<td>Compound</td>
<td>-</td>
<td>30% glass fiber compound for high stability pipes</td>
</tr>
</tbody>
</table>

**Recommended use:**
- **PR210G4E:** Pressure pipes for end user free additivation
- **PR210X6E:** Pressure pipes with high thermal stabilization
- **PG331A5000:** 30% glass fiber compound for high stability pipes

### Polypropylene for sewerage, drainage and cable protection

<table>
<thead>
<tr>
<th>Grade</th>
<th>Colour</th>
<th>MFI</th>
<th>Flexural modulus</th>
<th>Type of PP</th>
<th>Recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP015G3E</td>
<td>Natural</td>
<td>0.8</td>
<td>-</td>
<td>Homopolymer</td>
<td>Plain pipe for general purposes</td>
</tr>
<tr>
<td>PP020G3E</td>
<td>Natural</td>
<td>0.9</td>
<td>-</td>
<td>Homopolymer</td>
<td>Plain pipe for general purposes</td>
</tr>
<tr>
<td>PB110H2E</td>
<td>Natural</td>
<td>0.9</td>
<td>-</td>
<td>Homopolymer</td>
<td>Plain pipe for general purposes</td>
</tr>
<tr>
<td>PB120G1F</td>
<td>Natural</td>
<td>0.9</td>
<td>-</td>
<td>Block copolymer</td>
<td>General non-pressure pipes</td>
</tr>
<tr>
<td>PB130G1M</td>
<td>Natural</td>
<td>1.3</td>
<td>-</td>
<td>Block copolymer</td>
<td>Low diameter monolayer corrugated pipe</td>
</tr>
<tr>
<td>PB131N5E</td>
<td>Natural</td>
<td>1.3</td>
<td>-</td>
<td>Block copolymer</td>
<td>Low diameter monolayer corrugated pipe</td>
</tr>
<tr>
<td>PB140G2M</td>
<td>Natural</td>
<td>3.5</td>
<td>-</td>
<td>Block copolymer</td>
<td>High processability corrugated pipe</td>
</tr>
</tbody>
</table>

**Recommended use:**
- **PP015G3E:** Plain pipe for general purposes
- **PP020G3E:** Plain pipe for general purposes
- **PB110H2E:** General non-pressure pipes
- **PB120G1F:** General non-pressure pipes
- **PB130G1M:** Low diameter monolayer corrugated pipe
- **PB131N5E:** Low diameter monolayer corrugated pipe
- **PB140G2M:** High processability corrugated pipe

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Excellence is intrinsic to Repsol’s values. It infuses our daily work and helps guide our decisions and actions, contributing to achieve the commitment made to our customers, stakeholders, employees, suppliers / partners, and society to build a better future.

**Safety is our priority**

Petrochemical complexes and logistics centers all have ISO 45001. We are food safety leaders. All our facilities are FSSC 22000 certified in recognition of our food safety risk management processes throughout the supply chain.

Technical Data Sheets and MSDS are available on: [www.repsol.com](http://www.repsol.com)

| Petrochemical plants, plants and logistics | ISO 45001 |
| All industrial complex | FSSC 22000 |
| Puertollano, Tarragona, and Monzón plants | IATF 16949 |
| Puertollano and Monzón plants | UNE-EN 15343 |

**European directives:**

- Products recommended for use in pipes supplying drinking water comply with European standard EN 12201-1:2008.

Additionally, Repsol products have the following certifications for pressure pipes active:

<table>
<thead>
<tr>
<th>Water</th>
<th>T4ON, T10ONL5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaseous fuels</td>
<td>T10ONL5</td>
</tr>
<tr>
<td>T10ONL5</td>
<td>T10ONL5</td>
</tr>
</tbody>
</table>
Environment

We have set up and deployed an ambitious CO₂ program reduction that pursues a 40% reduction in SCOPE 1 & 2 emissions by 2030 [2017 as reference year] and zero emissions before 2050. Energy efficiency programs to reduce energy consumption and GHG emissions are one of the key elements of our strategy in the short term, followed by deep process electrification and CCUS. Biofeedstocks and renewable electricity will have a relevant role in this transition.

These programs pursue long-term targets made public to facilitate their progress by the stakeholders. In this sense, Repsol Química is committed to a reduction of 0.26 million tons per year of GHG emissions in the 2021-2025 Strategic Plan and a 1.3 million tons per year reduction until 2030 with a roadmap to be a net-zero company before 2050. Regarding SCOPE 3 emissions, Repsol Química will contribute to the CO₂ emissions reduction at the plastics’ end of life with our circularity projects.

All petrochemical complexes have ISO 14001 certification for their environmental management and the reduction of the impact of their facilities, and ISO 14064 for the annual verification of greenhouse gas (GHG) emissions. In addition, the chemical area of our complexes in Tarragona (2015), Puertollano (2013), and Sines (2016) has implemented an Energy Management System according to the requirements indicated in the International Standard ISO 50001. This system is dedicated to developing and implementing our organization’s energy policy and managing the energy aspects of our activities, products, or services. The objective is to increase and improve our energy efficiency based on systems implementation aimed at continuous energy performance improvement, thus contributing to more efficient and sustainable energy use.

Repsol Química has released on a yearly frequency the carbon footprint of all its product families since 2020, considering the “cradle to gate” scope based on ISO 14067.

Repsol’s purpose is to become a net-zero emissions company by 2050, and our 2021-2025 Strategic Plan enables us to continue successfully advancing our multi-energy commitment.
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