Blow-moulding
Polyethylene / Polypropylene

REPSOL
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.
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.

Over 1,500 references
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.

Over 100 scientists and researchers working for you
Including qualified personnel specialised 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.
At Repsol, we believe in the **circular economy** and we run specific projects that **minimise 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 a specialised department dedicated to the circular economy and the recycling of materials after consumption to drive the development of new materials offering innovative technical polyolefin solutions. We use recycled plastics in critical applications, creating new markets for plastic waste and incentivising circularity by giving it a new use. As a result, we provide a wide range of products for rigid blow-moulded packaging offering excellent technical performance.

We are a driving force in the circular economy for plastics and we are a member of the “**Circular Plastics Alliance**”, an initiative launched by the European Commission for ten million tonnes of recycled plastic to find their way into new products in the European market by 2025, in line with the strategy for the circular plastics economy published by the Commission in 2018.
Blow-moulding

Over 40 years of market experience

We have been developing our integrated chemical business for over 40 years and this experience allows us to control all of the key factors in the value chain: research, development, manufacture, marketing and distribution. With three integrated production facilities in the Iberian Peninsula, we have experience in high-cleanliness product launches with strict handling procedures in place and we provide a regular supply of materials to the food packaging industry.

Over 30 years of experience in technical services and development

Our Technology Lab Centre is the hub of our innovation and development. This is where our products come to life and are meticulously perfected in our quest for innovative solutions to meet our customers’ needs. Our mission is to develop cutting-edge products and offer high-quality solutions to improve your business.
Types of packaging materials used:

- Plastic: 37%
- Card: 34%
- Metal and others: 18%
- Glass: 11%

If foodstuffs were packaged with other materials, energy consumption would double and greenhouse gas emissions would almost triple. And all of this would also suppose a 360% increase in packaging weight!

Over 30 blow-moulding grades

Thanks to our versatility, we are able to produce one of the widest ranges of polyolefins on the market for industrial sectors such as:

- Agriculture
- Automotive
- Well-being & consumer products
- Packaging
- Household

Dairy and food products

Household goods and cosmetics

Industrial packaging

Automotive
Dairy and food products

Thanks to their greater density, our grades offer high rigidity from thinner material. Safety is our priority, and this has positioned us in the most demanding markets in terms of food safety.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Density</th>
<th>MFI</th>
<th>Tensile strength at break</th>
<th>ESCR</th>
<th>Flexural modulus</th>
<th>Container capacity</th>
<th>Main application</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDPE 6006L</td>
<td>963</td>
<td>0.6</td>
<td>40</td>
<td>18</td>
<td>&lt; 10</td>
<td>1450</td>
<td>&lt; 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Packaging for dairy products and other foods</td>
</tr>
<tr>
<td>HDPE 6006B</td>
<td>972</td>
<td>0.6</td>
<td>40</td>
<td>18</td>
<td>&lt; 10</td>
<td>1450</td>
<td>&lt; 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>White bottles for dairy products and other foods</td>
</tr>
<tr>
<td>HDPE 5703L</td>
<td>962</td>
<td>0.3</td>
<td>30</td>
<td>30</td>
<td>15</td>
<td>1550</td>
<td>&lt; 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Packaging for dairy products and other foods</td>
</tr>
</tbody>
</table>

(1) 10% Igepal, 50°C  
(2) Contains 1.25% TiO₂

We are food safety leaders. All of our facilities are FSSC 22000 certified in recognition of our food safety risk management processes throughout the supply chain.
## Dairy and food products

### Polypropylene

<table>
<thead>
<tr>
<th>Grade</th>
<th>MFI</th>
<th>Flexural modulus</th>
<th>Tensile strength at yield</th>
<th>Izod impact strength notched</th>
<th>Container capacity</th>
<th>Main application</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR230C1E</td>
<td>1.6</td>
<td>800</td>
<td>27</td>
<td>22</td>
<td>&lt; 10</td>
<td>Transparent containers</td>
</tr>
<tr>
<td>RC530S2E</td>
<td>1.6</td>
<td>800</td>
<td>27</td>
<td>22</td>
<td>&lt; 10</td>
<td>Very high gloss, transparency and clarity containers</td>
</tr>
<tr>
<td>PP320G3E</td>
<td>0.91</td>
<td>1200</td>
<td>34</td>
<td>-</td>
<td>&lt; 10</td>
<td>Thin walled containers</td>
</tr>
<tr>
<td>PP310G1E</td>
<td>1.7</td>
<td>1250</td>
<td>34</td>
<td>-</td>
<td>&lt; 10</td>
<td>Thin walled containers</td>
</tr>
</tbody>
</table>

- **PR230C1E**: 2.16 kg ISO1133 (230°C) g/10' ISO178 MPa ISO527-2 MPa ISO180/1A kJ/m² Litres
- **RC530S2E**: 2.16 kg ISO1133 (230°C) g/10' ISO178 MPa ISO527-2 MPa ISO180/1A kJ/m² Litres
- **PP320G3E**: 2.16 kg ISO1133 (230°C) g/10' ISO178 MPa ISO527-2 MPa ISO180/1A kJ/m² Litres
- **PP310G1E**: 2.16 kg ISO1133 (230°C) g/10' ISO178 MPa ISO527-2 MPa ISO180/1A kJ/m² Litres

We have a Product Stewardship department which ensures strict compliance with all of the legislation governing contact with foodstuffs.

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Household goods and cosmetics

Our commitment to the environment has driven us to new developments. The new Repsol Reciclex® range offers compounds using up to 50% of recycled material for the extrusion blow moulding of packaging.

**HDPE**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Density</th>
<th>MFI</th>
<th>Tensile strength at break</th>
<th>ESCR</th>
<th>Flexural modulus</th>
<th>Container capacity</th>
<th>Main application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kg/m³</td>
<td>ISO1133 (190°C) g/10'</td>
<td>ISO527-2 MPa</td>
<td>ASTM 1693 h [P50]</td>
<td>ISO178 MPa</td>
<td>Litres</td>
<td></td>
</tr>
<tr>
<td>S203</td>
<td>950</td>
<td>0.23</td>
<td>20</td>
<td>27</td>
<td>60</td>
<td>1100</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>S502E</td>
<td>955</td>
<td>0.23</td>
<td>22</td>
<td>28</td>
<td>35</td>
<td>1200</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>S503</td>
<td>955</td>
<td>0.25</td>
<td>25</td>
<td>28</td>
<td>100</td>
<td>1200</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>S803(2)</td>
<td>958</td>
<td>0.25</td>
<td>26</td>
<td>30</td>
<td>200</td>
<td>1400</td>
<td>&lt; 20</td>
</tr>
</tbody>
</table>

[1] 10% Igepal. 50°C.

**LDPE**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Density</th>
<th>MFI</th>
<th>Production process</th>
<th>Container capacity</th>
<th>Main application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kg/m³</td>
<td>ISO1133 (190°C) g/10'</td>
<td>Autoclave</td>
<td>Litres</td>
<td></td>
</tr>
<tr>
<td>PE003</td>
<td>920</td>
<td>2</td>
<td>Autoclave</td>
<td>&lt; 2</td>
<td>Soft containers for detergents and cosmetics</td>
</tr>
<tr>
<td>2308F</td>
<td>923</td>
<td>0.8</td>
<td>Tubular</td>
<td>&lt; 2</td>
<td>Soft containers for detergents and cosmetics</td>
</tr>
<tr>
<td>PE033</td>
<td>921</td>
<td>0.3</td>
<td>Autoclave</td>
<td>&lt; 2</td>
<td>Soft containers for detergents and cosmetics</td>
</tr>
</tbody>
</table>

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Household goods and cosmetics

### Polypropylene

<table>
<thead>
<tr>
<th>Grade</th>
<th>MFI</th>
<th>Flexural modulus</th>
<th>Tensile strength at yield</th>
<th>Izod impact strength notched</th>
<th>Container capacity</th>
<th>Main application</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR230C1E</td>
<td>1.6</td>
<td>800</td>
<td>27</td>
<td>22</td>
<td>~10</td>
<td>Transparent containers</td>
<td></td>
</tr>
<tr>
<td>RC530S2E</td>
<td>1.6</td>
<td>800</td>
<td>27</td>
<td>22</td>
<td>~10</td>
<td>Very high gloss, transparency and clarity containers</td>
<td></td>
</tr>
<tr>
<td>PP020G1E</td>
<td>0.91</td>
<td>1200</td>
<td>34</td>
<td>-</td>
<td>~10</td>
<td>Thin walled containers</td>
<td>High tenacity strapping, sheet extrusion</td>
</tr>
<tr>
<td>PP030G1E</td>
<td>1.7</td>
<td>1250</td>
<td>34</td>
<td>-</td>
<td>~10</td>
<td>Thin walled containers</td>
<td>High tenacity strapping, sheet extrusion</td>
</tr>
<tr>
<td>PB110H2E</td>
<td>0.3</td>
<td>1300</td>
<td>45</td>
<td>-</td>
<td>~10</td>
<td>Containers &lt; 10l</td>
<td>High shine sheet extrusion, pipes</td>
</tr>
<tr>
<td>PB130G1F</td>
<td>1.3</td>
<td>1100</td>
<td>27</td>
<td>-</td>
<td>~10</td>
<td>Containers &lt; 10l</td>
<td>Excellent gloss</td>
</tr>
</tbody>
</table>

Safety is a priority: we are OHSAS 18001 (Occupational Health and Safety Assessment Series) certified in recognition of our strict safety management.

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Industrial packaging

We are leading suppliers to the chemical, lubricant, fuel and food industries.

HDPE

<table>
<thead>
<tr>
<th>Grade</th>
<th>Density</th>
<th>MFI</th>
<th>Tensile strength at break</th>
<th>ESCR</th>
<th>Flexural modulus</th>
<th>Container capacity</th>
<th>Main application</th>
</tr>
</thead>
<tbody>
<tr>
<td>5803 (1)</td>
<td>958</td>
<td>0.25</td>
<td>26</td>
<td>30</td>
<td>200</td>
<td>1400</td>
<td>&lt; 20</td>
</tr>
<tr>
<td>45060UV (2)</td>
<td>945</td>
<td>&lt; 0.1</td>
<td>6</td>
<td>35</td>
<td>&gt; 1000</td>
<td>1000</td>
<td>700 - 4000</td>
</tr>
<tr>
<td>49070UV (2)</td>
<td>949</td>
<td>&lt; 0.1</td>
<td>9</td>
<td>30</td>
<td>&gt; 400</td>
<td>1000</td>
<td>700 - 4000</td>
</tr>
<tr>
<td>55050</td>
<td>955</td>
<td>&lt; 0.1</td>
<td>5.5</td>
<td>38</td>
<td>&gt; 200</td>
<td>1350</td>
<td>&lt; 200</td>
</tr>
</tbody>
</table>

(1) Bimodal.
(2) UV protected.

Our high molecular weight grades for packaging for the transport of hazardous and aggressive materials are lighter, while their rigidity and high resistance to cracking mean they use less material.
Automotive

We have grades suitable for high value-added products such as fuel tanks, aeration tubing and other motor vehicle parts, through our continuous development processes.

### HDPE

<table>
<thead>
<tr>
<th>Grade</th>
<th>Density</th>
<th>MFI</th>
<th>Tensile strength at break (ISO527-2)</th>
<th>ESCR (ASTM 1693)</th>
<th>Flexural modulus (ISO178)</th>
<th>Main application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kg/m³</td>
<td>g/10'</td>
<td>MPa</td>
<td>h (F50)</td>
<td>Mpa</td>
<td></td>
</tr>
<tr>
<td>5203</td>
<td>950</td>
<td>0.23</td>
<td>20</td>
<td>27</td>
<td>60</td>
<td>1100 Blow molding automotive products</td>
</tr>
<tr>
<td>5502E</td>
<td>955</td>
<td>0.23</td>
<td>22</td>
<td>28</td>
<td>35</td>
<td>1200 Blow molding automotive products</td>
</tr>
<tr>
<td>5503</td>
<td>955</td>
<td>0.25</td>
<td>25</td>
<td>35</td>
<td>35</td>
<td>1200 Blow molding automotive products</td>
</tr>
<tr>
<td>45060</td>
<td>945</td>
<td>&lt; 0.1</td>
<td>6</td>
<td>&gt; 1000</td>
<td>1000</td>
<td>Plastic fuel tanks</td>
</tr>
</tbody>
</table>

[1] 10% Igepal. 50°C

All of the activities of the Chemical Division at Repsol are ISO 9001 quality certified. Our industrial facilities meet the ISO 14001, ISO 50001 and OHSAS 18001 (Occupational Health and Safety Assessment Series) standards.
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, packaging facilities and logistics centres all have OHSAS 18001.2007 (Occupational Health and Safety Assessment Series) certification for their rigorous safety measures. Technical Data Sheets and MSDS are available on: www.repsol.com

<table>
<thead>
<tr>
<th>Petrochemical plants, packaging production plants and logistics</th>
<th>OHSAS 18001.2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>All industrial complex</td>
<td>FSSC 22000</td>
</tr>
</tbody>
</table>

Repsol supplies grades with excellent properties, specially designed for applications with stringent quality specifications.

All Repsol’s polyolefins production centers are FSSC 22000 certified.
Quality

All petrochemical plants are compliant with the current ISO 9001:2015 standards, for the quality of processes from manufacture to distribution, transport management and end product warehousing.

Environment

We set up and deploy ambitious energy efficiency programmes to reduce energy consumption and GHG emissions as one of the key elements of our strategy. These programmes pursue long term targets which have been made public in order to facilitate their progress by the stakeholders. In this sense, Repsol Química has attained a final reduction of 0.56 million tonnes of GHG emissions at the end of the 2006-2013 period. Repsol is currently working on a new target covering the period 2014-2020, that involves an additional reduction of 0.42 million tonnes of CO₂.

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, as well as manage 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 performances improvement and thus contribute to a more efficient and sustainable use of energy.

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.

Repsol reinforced its commitment with sustainability by signing the “Paris Pledge for Action” document. An historical agreement in which both developed countries and less developed countries and companies engaged to contribute towards a low CO₂ emission economy.
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