Sustainable solutions in polyolefins

Towards a Circular Economy

REPSOL Reciclex

Innovating for a sustainable world

At Repsol, we believe in the circular economy. We focus our innovation solely on our customers' needs to create highly differentiated products compliant with even the strictest standards.

Our Repsol Reciclex® range of sustainable polyolefins comprehends **over 30 grades with a high content of mechanically recycled material;** a **full Repsol range from chemical recycling** and an **entire polyolefin bio-based range**, including **first-generation Bio (1G) from sustainably sourced crops**, and **second-generation bio-based circular polyolefins (2G) from renewable waste.**

Our mechanically recycled materials deliver outstanding technical performance certified by the Recyclass standard and are adapted to the different application needs.

Our ISCC Plus certified circular polyolefins from chemically recycled plastic waste and bio-based ranges maintain the same properties and quality as the original raw materials.

Sustainability is essential to our forward-looking vision and the shared commitment undertaken by everyone at Repsol to become net zero emissions by 2050.

REPSOL Reciclex

Repsol. A global multi-energy company

With over 8 decades of experience

We are leading the energy transition by being the **first company in the energy sector to set the goal of reaching net zero emissions by 2050**.

Present throughout the energy value chain, the company **employs 24,000 people worldwide** and distributes its products in **nearly 100 countries**. Customer-focused product and services portfolio meets all consumer needs of around **24 million customers**, whether at home or on the move.

Repsol Campus, Corporate Headquarters in Madrid
LEED® Platinum certificate, awarded by the prestigious U.S. Green Building Council (USGBC), for new buildings construction

Chemicals

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 specialized on Product Stewardship.

Repsol's commitment to R&D is evidence of the company's aim to attain business excellence to meet future horizons.

Added value

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

Working for a more sustainable future

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 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 certified under Recyclass.

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 hold Food Contact Approval.

We have obtained ISCC PLUS certification for circular and traceable polyolefins that use plastic waste as raw material.

Commited
to Net Zero
Emissions

Furthermore, **we offer a full Repsol Reciclex® ISCC Plus Certified Polyolefin Bio-based range, including first-generation Bio (1G) from sustainably sourced crops**, following the ISCC EU 202 best environmental, social, and economic practices; and second-generation bio-based circular polyolefins (2G) from renewable waste.

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.

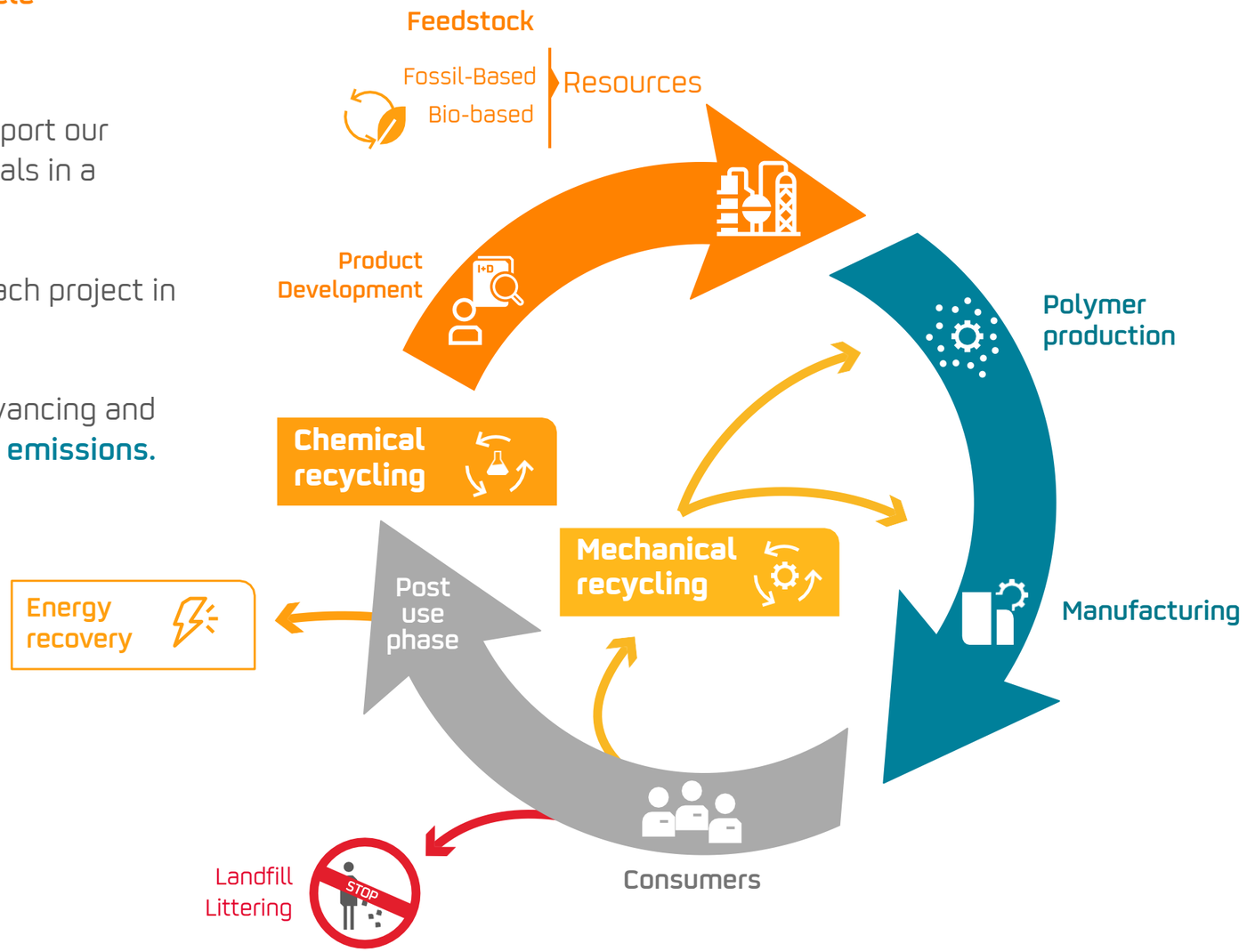
To contribute to the company's emissions neutrality goal, **our chemicals business has launched its 3030 Plan, intended to cut our carbon intensity by 30% by 2030**.

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.

Repsol Reciclex® range

Advancing the sustainability circle

- **Repsol Reciclex® products** support our clients in their sustainability goals in a comprehensive way.
- With three ranges to support each project in a **personalized way.**
- With a vocation to continue advancing and supporting the goal **of zero net emissions.**



Circular Economy

The range that fosters circularity

Advancing towards a circular economy

How do we name our sustainable grades?

Equivalent to mechanical recycling, all grades are begins/named Repsol Reciclex®

- 00**RX**YYY for **LDPE/LLPE/HDPE**
- **RX**P/**RX**IYYY for **PP**

Equivalent to chemical recycling for Repsol Primeva® P28400 standard grade:

- Repsol Reciclex® CIRCP28400

REPSOL Reciclex

MECHANICAL RECYCLING

- Over 30 grades with high proportions of recycled content.
- Applications in film, rigid packaging, auto, blow molding, compounding and others.
- Non-food applications.
- Low carbon footprint.
- Recyclass traceability certificate.
- Consistent quality and homogeneity.
- 100% recyclable.

CHEMICAL RECYCLING

- 100% recycled plastic raw material.
- Completes the material life cycle.
- Full Repsol range across all applications.
- Same properties as standard range.
- Suitable for sensitive applications: food, hygiene and medical use.
- Low carbon footprint.
- ISCC Plus certificate.
- 100% recyclable.

The negative carbon footprint polyolefin range

Advancing towards a circular economy

How do we name our sustainable grades?

For **bio-based** equivalent for our Repsol Primeva® P28400 standard grade:

- **Bio (1G):**
  Repsol Reciclex® BIOP28400
- **Bio Circular (2G):**
  Repsol Reciclex® CBIOP28400

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BIO-BASED

- Ranges includes (Bio 1G) Bio vegetable origin made from sustainable crops (palm oil, soja oil, shea nuts oil and, (Bio 2G) Bio Circular, bio-waste origin, i.e., EVA made from vegetable oil or animal waste like UCO´s or brown animal grease.
- Complies with all Food Safety regulations and, like the rest of our range, they are 100% recyclable to close the circle of sustainability.
- 100% bio-based.
- ISCC EU (Renewable Energy Directive 2018/2001) compliant and ISCC Plus certificate.
- Suitable for food, hygiene and medical use.
- 100% recyclable.

Close to 30 grades of Repsol Reciclex®

Automotive

Well-being
& consumer products

Packaging

We are embarking on partnerships to find solutions together.

We are committed to innovating to increase the circularity and efficient use of plastic materials.

- Incorporating mechanically and chemically recycled plastics.
- Giving plastic waste a new life to avoid it ending up in landfill.
- Reducing fossil raw material consumption.
- Reducing carbon footprint.
- Committing to technical requirements.
- Helping to meet voluntary commitments and legislative targets.

- Flexible packaging
- Injection molding
- Fibers molding
- Caps and closures
- Blow molding
- Sheet & general extrusion
- Wire & cable
- 100% recycled material

REPSOL Reciclex

Flexible packaging

LDPE

Grade	Recycled material	Similar reference	Color	LLDPE content	MFI	Density	Application
	[%] PCR			[%]	[g/10 min] 190 °C/2.16 Kg	[kg/m^3]	
50RX2404F	50	PE033/2203F	Natural	15-25	0.4	924	Thin shrink film, medium duty industrial bags, films for general packaging.
70RX2805F	70	2805F	Natural	35-45	0.8	925	Shrink film, medium duty industrial bags, films for general packaging.
60RX3235G	60	3235FGA	Natural	35-45	2	923	Hygiene overwrap films and easy tear films.
80RX2310F	80		Natural	40-50	1	921	Packaging and medium-capacity bags.
85RX2310F	85		Natural	45-55	1	921	Packaging and medium-capacity bags.

LLDPE/mLLDPE

Grade	Recycled material	Similar reference	Color	LLDPE content	MFI	Density	Application
	[%] PCR			[%]	[g/10 min] 190 °C/2,16 kg	[kg/m^3]	
70RX2110G	70	MF1810FG	Natural	70-85	1	923	Carrier bags, refuse bags with demanding properties.
72RX2110F	72	MF1810F	Natural	70-85	1	923	Medium duty industrial bags, films for general packaging.
55RX1830F	55	MF1835F	Natural	85-95	3	918	Stretch film.

Sustainability
Materials that incorporate plastic post-consumer waste lower the carbon footprint

Less energy
High fluidity, excellent processability

Downgauging
Film thickness reduction

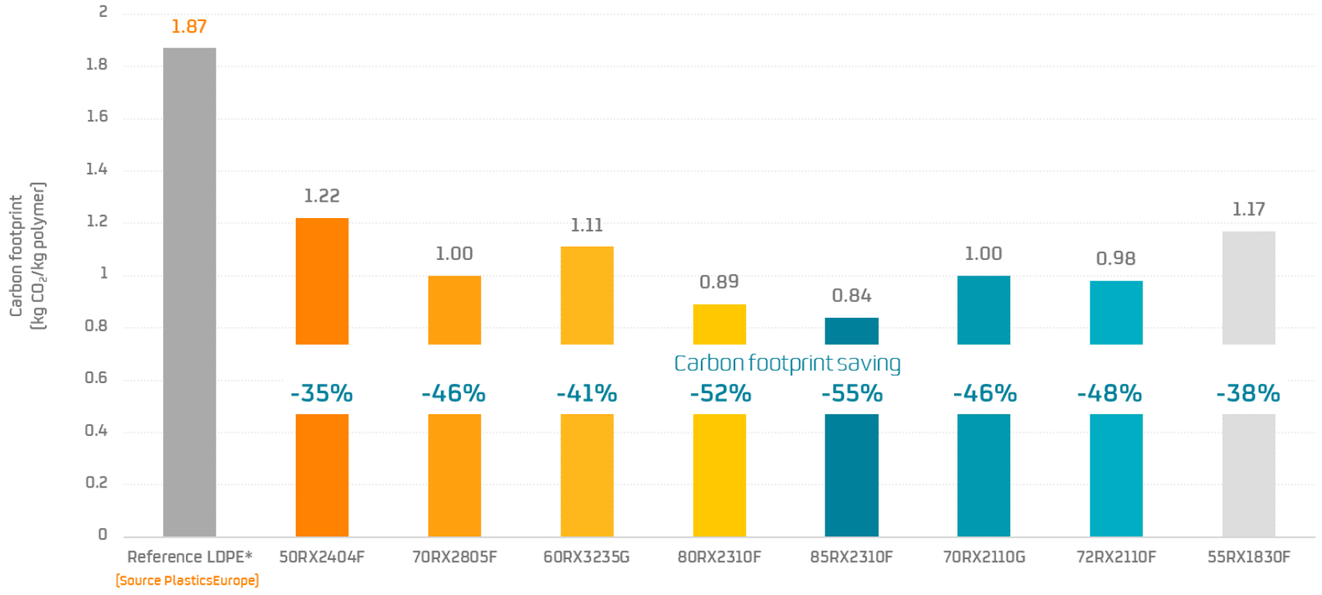
› Blow molding

Flexible packaging

LDPE

Carbon footprint saving

The results are based on Repsol Internal study; has not undergone ISO critical reviews



Sustainability
Materials that incorporate plastic post-consumer waste lower the carbon footprint

Less energy
High fluidity, excellent processability

Downgauging
Film thickness reduction

Blow molding

Monomaterial solutions that facilitate the recyclability of industrial film. They incorporate post-consumer recycled materials improving their sustainability and maintaining excellent properties

Blow molding

HDPE

Grade	Recycled material	Similar reference	Color	MFI	Density	Tensile strength at break	ESCR	Flexural modulus	Application
	[%] PCR			[g/10 min]	[kg/m^3]	[MPa]	[h]	[MPa]	
50RX5503	50	5503	Natural and grey	0,25 *	955	20	100	1100	Blow molded containers up to 10 liters for liquid detergents and chemicals.
70RX5203	70	5203	Natural	0,25 *	955	20	60	1100	Blow molded containers up to 10 liters for liquid detergents and chemicals.
100RX5203G	100	5203	Grey	0.3 *	955	17	40	1150	Blow molded containers up to 10 liters for liquid detergents and chemicals.
80RX55050	80	55050	Light grey	10,5 **	960	25	200	950	Blow molding of jerrycan containers and industrial packaging for ADR.

* MFI (190 ºC / 2.16 kg)

** MFI (190 ºC / 21.6 kg)

Carbon footprint saving

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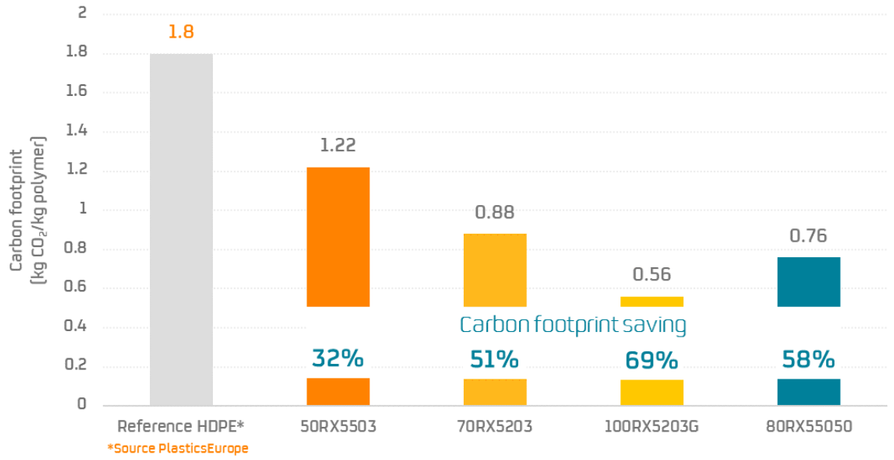

Flexible packaging Injection molding

Injection molding

Polypropylene

Grade	Recycled material	Similar reference	Color	MFI	Density	Flexural modulus	Charpy impact strength	Application
	[%] PCR			[g/10 min] 230º C/2,16 kg	[kg/m^3]	[MPa]	23ºC, notched [kJ/m^2]	
RXP48AH000	40	PP080G2M	Light grey (RAL 7038)	16	905	1550	4	Containers and rigid packaging, garden, and domestic furniture, base product for compounds, caps, and closures.
RXP52BI000	50	PB170G2M	Light grey (RAL 7038)	10	910	1100	10	Domestic and leisure furniture, square boxes and round storage containers for consumer appliances, flowerpots, buckets.
RXP49AG000	40	PB190K2M	Light grey (RAL 7038) and dark grey (RAL 7021)	30	905	1200	7.9	Domestic and leisure furniture, square boxes and round storage containers for consumer appliances, flowerpots, buckets.
RXP50AT000 / RXP50AT790	50	PB196K1M	Light grey (RAL 7038) and ivory (RAL 9016)	40	935	1450	4	Domestic and leisure furniture, square boxes and round storage containers for consumer appliances, flowerpots, buckets.
RXP80AT000	80	PB190K2M	Light grey (RAL 7038)	40	940	1200	4.5	Domestic and leisure furniture, square boxes and round storage containers for consumer appliances, flowerpots, buckets.
50RXPP091I	50		Black	35		3000	4	Automotive and structural parts: under the bonnet parts subjected to severe mechanical stresses (light housings, heat, and ventilation housings, filters), technical pieces, and furniture.
RXP77AT000	80		Black	12		1600	4.5	Pallets, furniture, and technical parts, in general.

Carbon footprint saving

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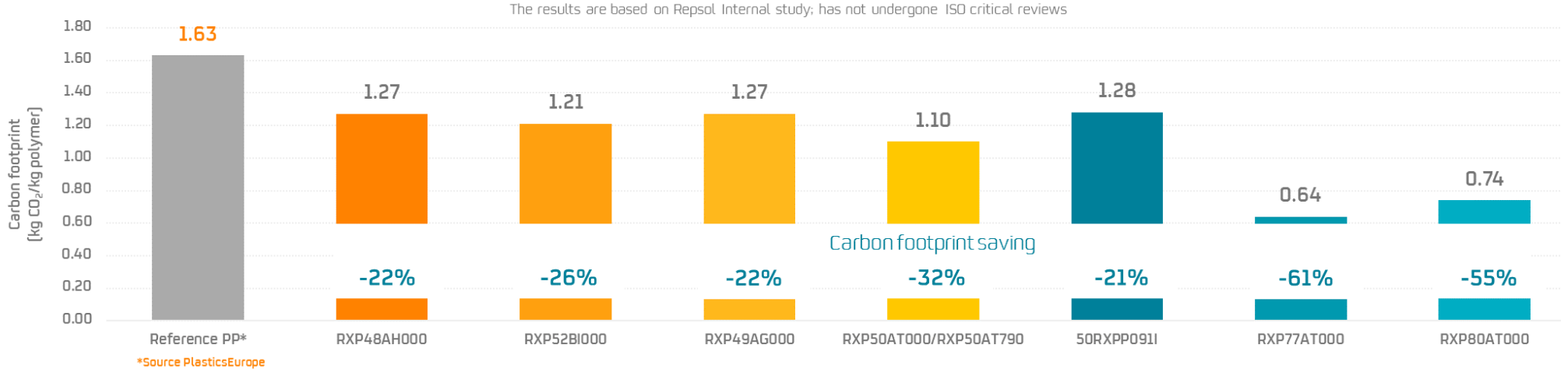

Blow molding ‹ › Sheet & general extrusion

Sheet and general extrusion

Polypropylene

Grade	Type of recycled material	Recycled material	Similar reference	Color	MFI	Density	Flexural modulus	Charpy impact strength	Application
		%			(g/10 min) 230 ºC/2,16 kg	(kg/m^3)	(MPa)	23ºC, notched (kJ/m^2)	
RXP52BG000	PCR	50	PB130G1F	RAL 7038	1.5	910	1400	10	Sheet extrusion. Boards and profiles.
RXI52BG000	PIR	50	PB130G1F	Natural	1	905	1500	10	Sheet extrusion. Boards and profiles.

Carbon footprint saving

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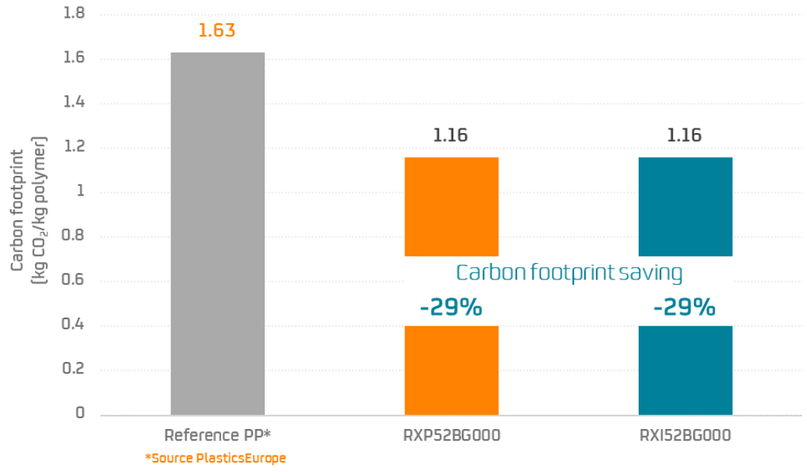

Injection molding ‹ › Fibers molding

Fibers molding

Polypropylene

Grade	Type of recycled material	Recycled material	Similar reference	Color	MFI	Flexural modulus	Charpy impact strength	Application
		%			(g/10 min) 230 ºC/2,16 kg	(MPa)	23ºC, notched (kJ/m²)	
RXP33AA000	PCR	30	PP020G1E / PP030G1E	Grey	2	1600	5	Monofilament, strap and sheet extrusion.
RXP39HY000	PIR	30	PP086Y3E	Natural	25	1600	4	Spunbond, BCF and CF.
RXP59HY000	PIR	50	PP086Y3E	Natural	25	1600	4	Spunbond, BCF and CF.

Carbon footprint saving

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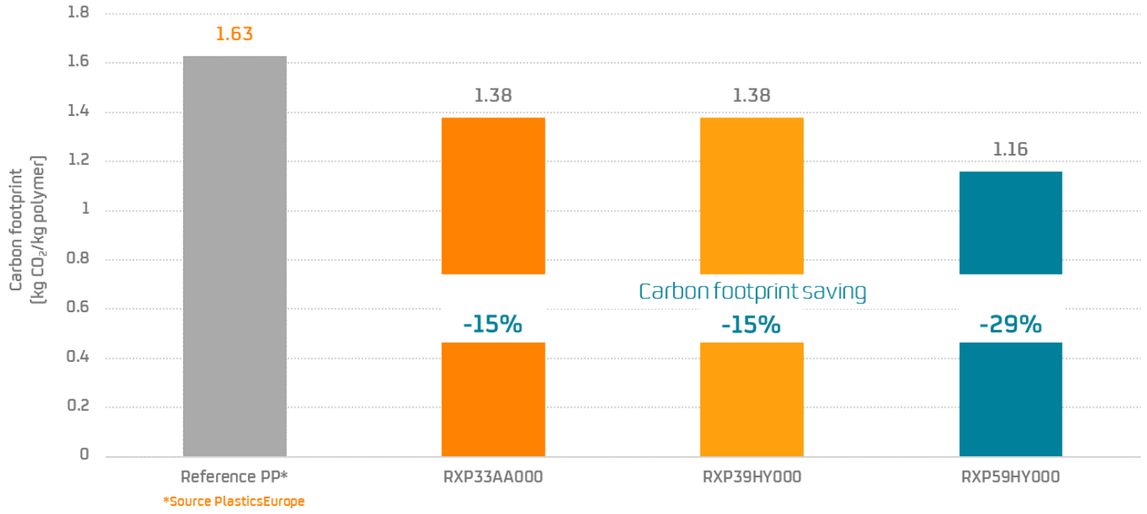


*Source PlasticsEurope

Lightweight Reusable Recyclable Recycled content

New PP grade incorporate recycled material while ensuring consistency in quality and functionality

Sheet & general extrusion ‹ › Wire & cable

Wire & cable

LDPE

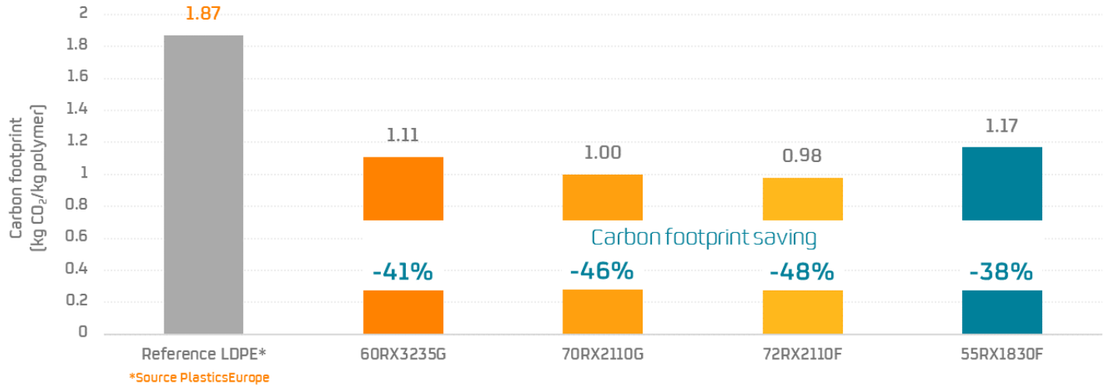
Grade	Recycled material	Similar reference	Color	LLDPE content	MFI	Density	Application
	[%] PCR			[%]	[g/10 min] 190 ºC/2.16 Kg	[g/cm^3]	
60RX3235G	60	3235FGA	Natural	35-45	2	923	LDPE for jacketing and bedding compounds.

LLDPE/mLLDPE

Grade	Recycled material	Similar reference	Color	LLDPE content	MFI	Density	Application
	[%] PCR			[%]	[g/10 min] 190 ºC/2.16 Kg	[g/cm^3]	
70RX2110G	70	MF1810FG	Natural	70-85	1	923	LLDPE for jacketing and bedding compounds.
72RX2110F	72	MF1810F	Natural	70-85	1	923	LLDPE for jacketing and bedding compounds.
55RX1830F	55	MF1835F	Natural	85-95	3	918	LLDPE for jacketing and bedding compounds.

Carbon footprint saving

The results are based on Repsol Internal study; has not undergone ISO critical reviews



*Source PlasticsEurope

Fibers molding ‹ › Caps & closures

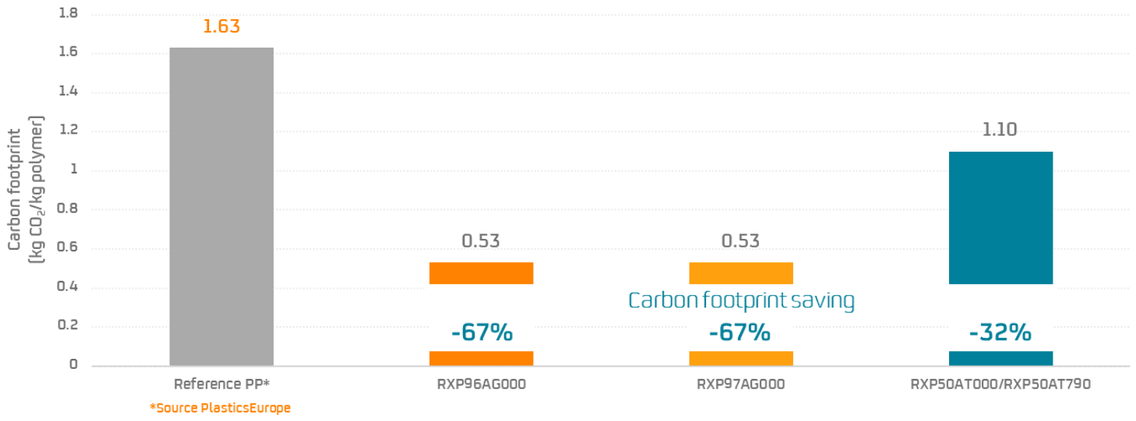
Caps and closures

Polypropylene

	Recycled material	Similar reference	Color	MFI	Density	Flexural modulus	Charpy impact strength	Application
	[%] PCR			[g/10 min] 230º C/2,16 kg	[g/cm^3]	[MPa]	23ºC, notched [kJ/m^2]	
RXP96AG000	100		Light grey [RAL 7038]	18-25	915	1100	4.5	Caps and closures / general purpose.
RXP97AG000	100		Light grey [RAL 7000]	17-27	910	1100	4	Caps and closures / general purpose.
RXP50AT000 / RXP50AT790	50	PB196K1M	Light grey [RAL 7038] and white [RAL 9016]	40	935	1450	4	Caps and closures / general purpose.

Carbon footprint saving

The results are based on Repsol Internal study; has not undergone ISO critical reviews



*Source PlasticsEurope

Wire & cable 100% recycled materials

100% Recycled materials

Polypropylene

Grade	Recycled material	Color	MFI	Density	Flexural modulus	Charpy impact strength	Application
	[%] PCR		[g/10 min] 230º C/2,16 kg	[g/cm^3]	[MPa]	23ºC, notched [kJ/m^2]	
RXP97AG000	100	Light grey (RAL 7038)	17-27	910	1100	4	Auto-formulation of compounding grades, compounding and masterbatch of additives.
RXP96AG000	100	Light grey (RAL 7038)	18-25	915	1100	4.5	Auto-formulation of compounding grades, compounding and masterbatch of additives.
RXP99AG000	100	Light grey (RAL 7038)	40-45	915	1100	4	Auto-formulation of compounding grades, compounding and masterbatch of additives.
RXP95AT000	100	Black	9-15	950	1200	20	Auto-formulation of compounding grades, compounding and masterbatch of additives.

Carbon footprint saving

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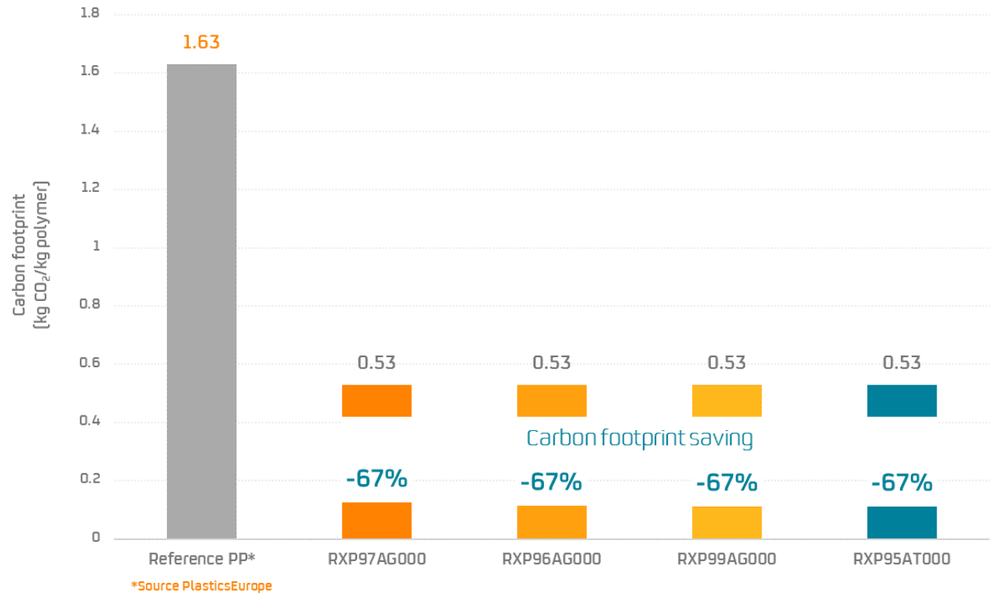


Caps & closures

Safety and quality are our priority

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.

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.

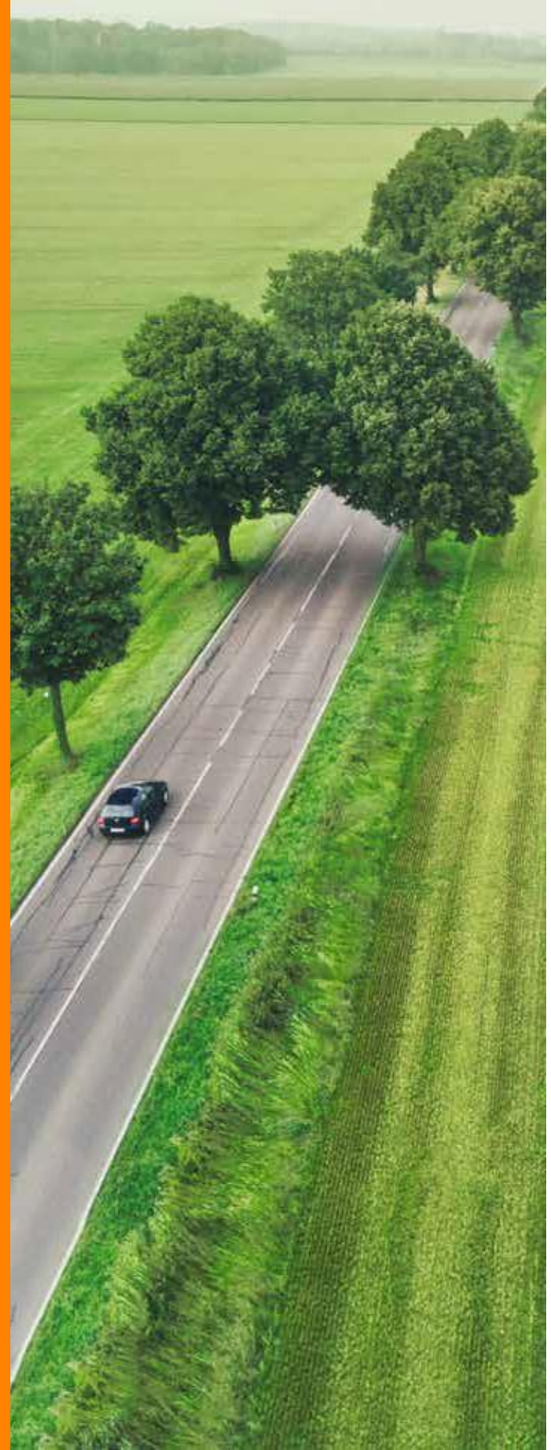
Technical Data Sheets and MSDS are available on: www.repsol.com

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

In February 2019 we obtained the ISCC PLUS certification in all our polyolefin production centers. **We are one of the leading companies in the production of circular polyolefins that use recycled plastic waste as raw material**, and this certification is an example of our commitment to promote the Circular Economy of our materials.

Certifications

Petrochemical plants, plants and logistics	All industrial complex	Puertollano, Tarragona and Monzón plants	Puertollano and Monzón plants	Puertollano, Tarragona and Sines
ISO 45001	FSSC 22000	IATF 16949	Recyclass	ISO 50001 ISO 14001 ISO 14064
	All petrochemical plants ISO 9001 ISCC Plus			



Environment

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.

We have set up and deployed an ambitious CO_2 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 CO_2 emissions reduction at the plastics' end of life with our circularity projects, while we offer sustainable solutions for our clients: 100% recyclable polyolefins.

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.

Collaboration *Results orientation* *Inspiring leadership*

Intrapreneurship *Accountability*

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