

# Cables

Polyethylene / EVA / EBA / Polypropylene



# Innovation for a sustainable future

The cable industry is moving towards a more sustainable future, and at Repsol, **we're leading the way with our Repsol Reciclex<sup>®</sup> range of sustainable polyolefins.**

Our innovative mechanical recycling range includes low-density polyethylene (LDPE) and linear low-density polyethylene (LLDPE) with up to 70% mechanically recycled content from post-consumer plastic waste (PCR). Certified by Recyclclass, these materials reduce carbon footprint without compromising quality.

Also we offer three ISCC Plus certified options: circular polyolefins from chemical recycling, first-generation bio-based polyolefins from sustainable crops, and second generation bio-circular polyolefins from organic waste.

With our Repsol Reciclex<sup>®</sup> range, **we provide our customers with a complete and certified offering of sustainable polyolefins that meet the demands of the cable industry in emissions reduction and environmental sustainability.**

**Join us in the green revolution of the cable industry!**



REPSOL  
Reciclex



# Repsol. A global multi-energy company

## With over 8 decades of experience

It is leading the energy transition with its ambition of achieving zero net emissions by 2050.

Present throughout the energy value chain, the company employs 24,000 people worldwide and distributes its products in nearly 100 countries. Its 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 Recyclclass.

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 the traceability of the plastic waste used as raw material in our circular polyolefins.

Furthermore, **we offer a full Repsol Reciclex<sup>®</sup> 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**.

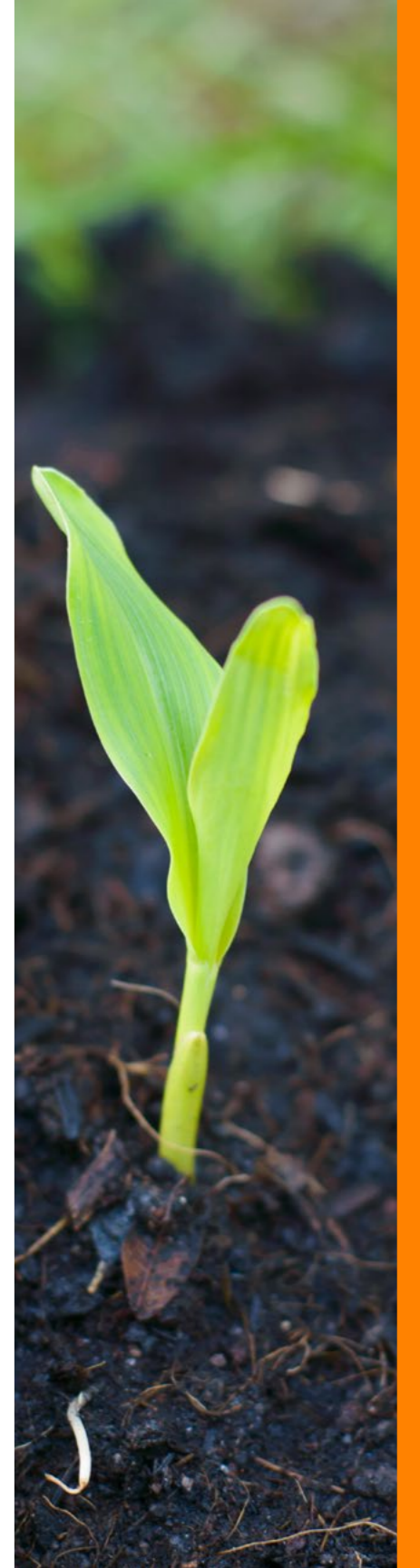
Our **ambition is to produce 10% of our polyolefins as biobased and circular products by 2030**, a move that will promote the circular economy. This initiative, in conjunction with other initiatives in Repsol's circular economy strategy, will support the company's goal of achieving net zero emissions 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**.



**Committed  
to Net Zero  
Emissions**





## How do we name our sustainable grades?

All our **mechanical & chemical recycling** grades are branded under Repsol Reciclex®.

- **Mechanical recycling** grades equivalent to standard grades include **RX** in their nomenclature.
- For **LDPE/LLDPE** grades Repsol Reciclex® 00RX**YYY**, i.e.: Repsol Reciclex® 55**RX**1830F [incorporating 55% recycled content].

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# The range that fosters circularity

Advancing towards a circular economy

## MECHANICAL RECYCLING

- 4 grades with high proportions of recycled content.
- Low carbon footprint.
- Recyclclass 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.
- Low carbon footprint.
- ISCC Plus certificate.
- 100% recyclable.

## How do we name our sustainable grades?

All our **bio-based** grades are branded under Repsol Reciclex®.

- **Bio (1G)** grades equivalent to standard grades include BIO to their regular nomenclature Repsol Reciclex® **BIO**YYYYYY, i.e.: Repsol Alcludia® PE004S > Repsol Reciclex® **BIO**PE004S.
- **Bio Circular (2G)** grades equivalent to standard grades include CBIO to their regular nomenclature Repsol Reciclex® **CBIO**YYYYYY, i.e.: Repsol Alcludia® PE004S > Repsol Reciclex® **CBIO**PE004S.

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Reciclex 

# The negative carbon footprint polyolefin range

Advancing towards a circular economy

## 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., polyolefins 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.





Over 40 grades for cables

# Power and communication cables

## Power cables

### Semiconductive shields

Wide EVA and EBA range as base resins to manufacture semiconductive compounds.

### Insulation

Developed specifically for crosslinking process:

- Low voltage: wide LDPE product range stabilized and additive free for use with both peroxide and silane crosslinking processes.
- Medium voltage: clean LDPE product range for direct peroxide injection.

### Jacketing

- LDPE, MDPE and HDPE grades which contain additivation for excellent stress cracking performance.
- EVA, EBA and PP base resins intended for halogen-free-flame-retardant (HFFR) compounds.

## Communication cables

### Insulation

LDPE and HDPE products stabilized with good processability.

### Jacketing

- LDPE, MDPE and HDPE grades which contain additivation for excellent stress cracking performance.
- EVA, EBA and PP base resins intended for halogen-free-flame-retardant (HFFR) compounds.





# Cables

## **Over 33% expected increase in energy consumption by 2030**

Chemicals, and specialty plastics, are the key element to the development of modern and advanced cables to meet the increasingly higher requirements in electrical infrastructures.

## **Over 30 years of experience in technical services and development**

Our Repsol Technology Lab 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.



# Insulation grades for low voltage

LDPE, mLLDPE



Grade	MFI	Density	Elongation at break	Tensile strength at break	Dielectric constant	Dissipation factor	Polymer type / Crosslinking / Description
	ISO 1133 g/10 min 190 °C / 2.16 Kg	ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	ISO 527-2 MPa	ASTM D 1531 1MHz	ASTM D 1531 1MHz	
PE003	2.4	920	500	14	2.3	0.0003	LDPE / Peroxide XLPE / Insulation. Additive free.
2202C	0.25	921	600	16	2.3	0.0003	LDPE / Silane XLPE / Insulation for monosil process. Additive free.
2303C	0.35	923	400	18	2.3	0.0003	LDPE / Silane XLPE / Insulation for monosil process. Stabilized with antioxidant and metal deactivator.
Resistex 1835C	3.5	918	700	35	2.2	0.0004	mLLDPE / Silane XLPE / Insulation for monosil process.

LV: low voltage





# Insulation grades for medium voltage

LDPE



Grade	MFI ISO 1133 g/10 min 190 °C / 2.16 Kg	Density ISO 1183 Kg/m <sup>3</sup>	Elongation at break ISO 527-2 %	Tensile strength at break ISO 527-2 MPa	Dielectric constant ASTM D 1531 1MHz	Dissipation factor ASTM D 1531 1MHz	Polymer type / Crosslinking / Description
PE004	2.4	920	500	14	2.3	0.0003	LDPE / Direct peroxide injection XLPE / Clean XLPE insulation. Additive free.
CP104	2.4	920	500	14	2.3	0.0003	LDPE / Direct peroxide injection XLPE / Clean and stabilized XLPE insulation.
CP004TR	2.4	920	500	14	2.3	0.0003	LDPE / Direct peroxide injection XLPE / Water tree retardant XLPE insulation.
PE004S	2.4	920	500	14	2.3	0.0003	LDPE / Direct peroxide injection XLPE / Extra clean XLPE insulation. Additive free.

XLPE: crosslinkable polyethylene



Repsol supplies insulation grades for low and medium voltage power cables. These have been developed specifically for crosslinking process



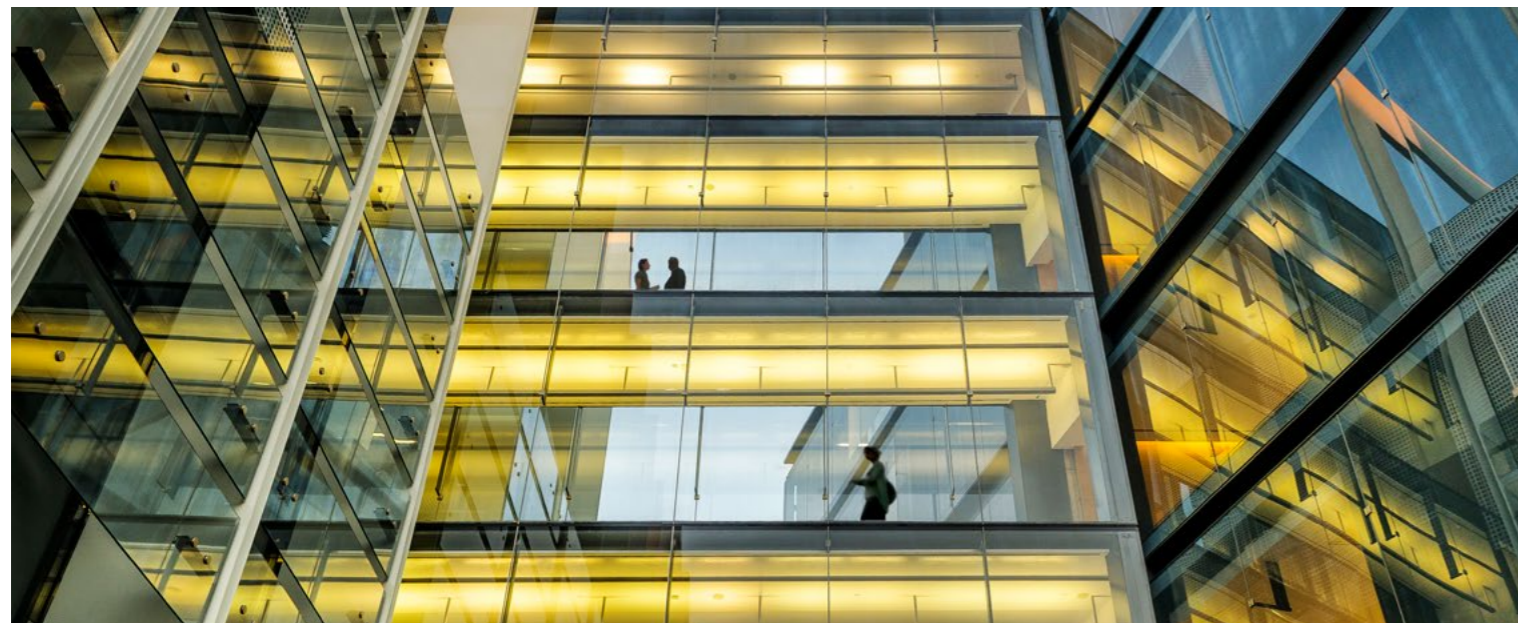


# Insulation grades for telecommunication

LDPE, HDPE, PP



Grade	MFI	Density	Elongation at break	Tensile strength at break	Dielectric constant	Dissipation factor	Polymer type / Description
	ISO 1133 g/10 min 190 °C / 2.16 Kg	ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	ISO 527-2 MPa	ASTM D 1531 1MHz	ASTM D 1531 1MHz	
CP121	0.35	921	600	16	2.3	0.0003	LDPE solid insulation. General purpose insulation. It contains a metal deactivator.
CAB4910	0.9	949	700	20	2.3	0.0004	HDPE stabilized with a metal deactivator. Solid insulation cables.
PP020G3E	1 (230 °C)	905	-	34	-	-	PP-H. Insulation compounds based on PP.
PR264G1F	8.5 (230 °C)	905	-	-	-	-	PP-R. Insulation compounds based on PP.



LDPE and HDPE grades for the communication industry are specially additivated to assure an excellent quality of the cable





# Jacketing grades for power and telecommunication

LDPE, HDPE, MDPE, mLLDP



Grade	MFI	Density	Elongation at break	Tensile strength at break	Dielectric constant	Dissipation factor	Polymer type / Crosslinking / Description
	ISO 1133 g/10 min 190 °C / 2.16 Kg	ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	ISO 527-2 MPa	ASTM D 1531 1MHz	ASTM D 1531 1MHz	
2202CN	0.25	934	600	14	2.6	0.005	Black LDPE / Telecommunication jacketing / Excellent processability.
3802N	0.20	950	600	35	2.5	0.0002	Black HDPE / Jacketing for energy cables / High stiffness.
C220N	0.6	955	800	27	2.7	0.006	Black HDPE / Jacketing for fiber and telecommunication cables / Low shrinkage.
5605N	0.45	958	600	> 30	2.5	0.005	Black HDPE / Jacketing for energy and telecommunication cables.
C240UV	21 (21.6 kg)	939	800	28	2.3	0.00013	MDPE / Jacketing for energy and telecommunication cables / Colorable and UV protection.
3802	0.2	938	900	28	2.5	0,0002	HDPE / Jacketing for energy cables / High stiffness.
CAB4805UV	0.45	948	650	> 30	-	-	HDPE / Jacketing for energy cables / Low shrinkage.
MF3810N	1	938	> 600	> 30	2.5	0.00012	Black mLLDPE / Jacketing for power and telecommunication cables.



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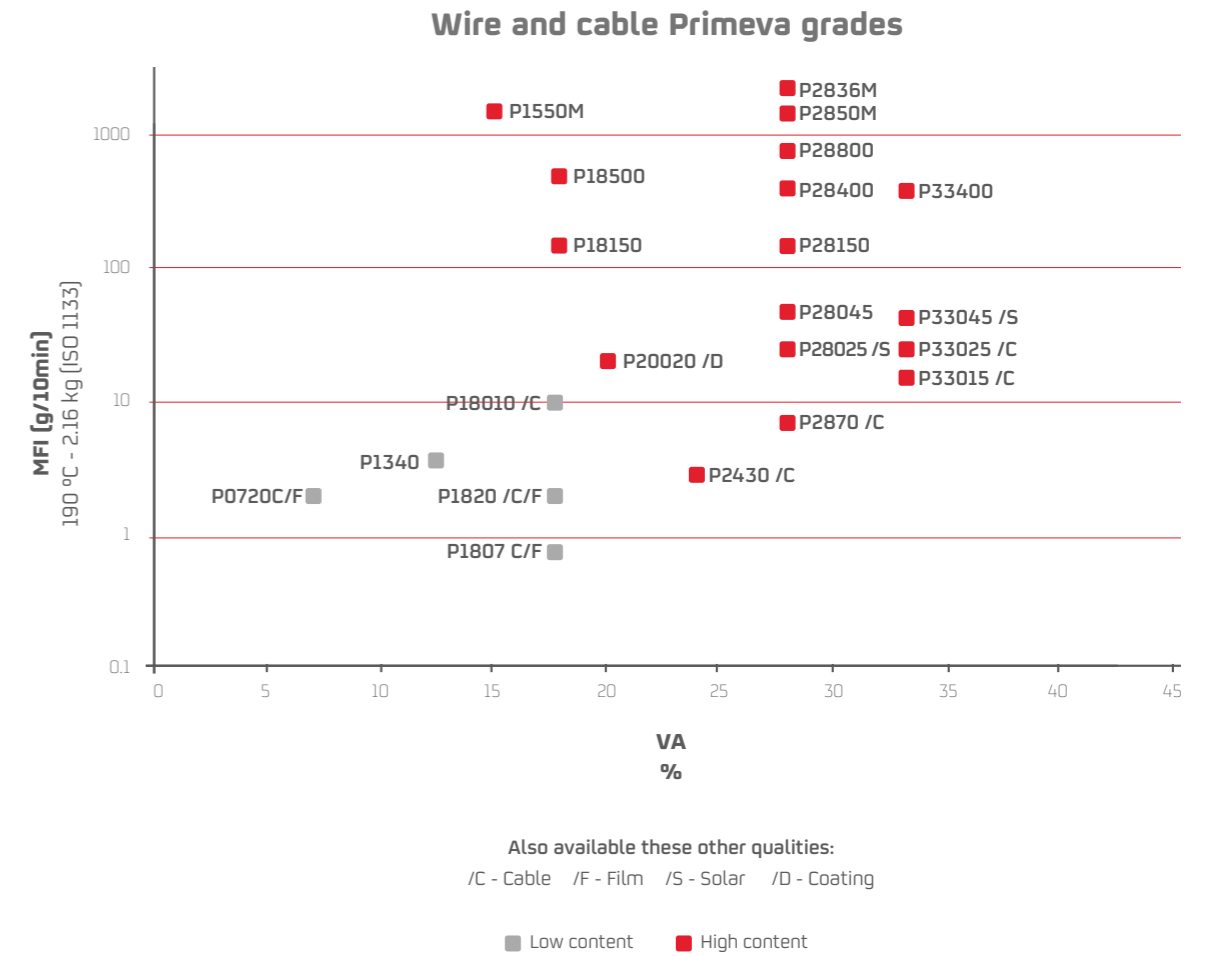
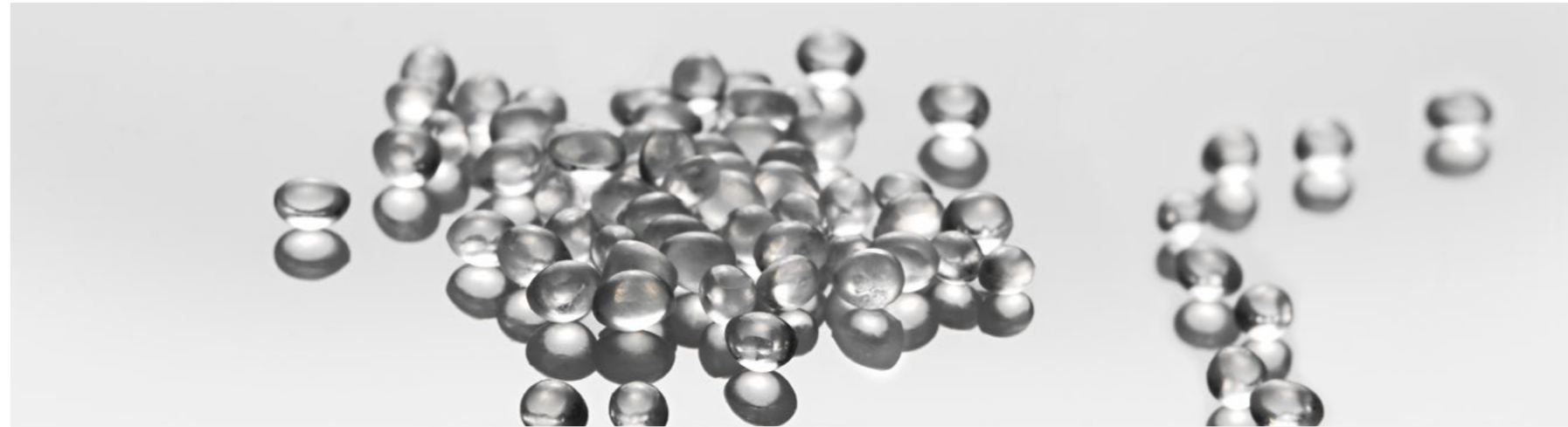


# Base resins for cable compounds



Grade	MFI	VA content	Density	Elongation at break	Tensile strength at break	Polymer type / Crosslinking / Description
	ISO 1133 g/10 min 190 °C / 2.16 Kg	Internal method %	ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	ISO 527-2 MPa	
P1807C	0.7	18	941	850	32	EVA / HFFR compounds.
P1820C	2	18	937	750	17	EVA / HFFR compounds.
P2430C	3	24	944	740	25	EVA / HFFR compounds.
P2870C	7	28	950	760	22	EVA / HFFR compounds.
P33015C	15	33	956	800	14	EVA / HFFR compounds / Semiconductive compounds.
P33025C	25	33	956	825	6	EVA / HFFR compounds / Semiconductive compounds.
P33045	65	40	969	930	7	EVA / HFFR compounds / Semiconductive compounds.

These base resins are suitable for the fabrication of halogen-free flame-retardant (HFFR), semiconductive or other cable compounds





# Base resins for cable compounds



Grade	MFI	BA content	Density	Elongation at break	Tensile strength at break	Polymer type / Crosslinking / Description
	ISO 1133 g/10 min 190 °C / 2.16 Kg	Internal method %	ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	ISO 527-2 MPa	
E803C	0.3	8	924	540	22	EBA / HFFR compounds.
E1240	4	12	925	700	14	EBA / HFFR compounds.
E1303	0.3	13	925	585	20	EBA / HFFR compounds.
E1704	0.4	17	925	640	19	EBA / HFFR compounds.
E1715	1.5	17	926	833	17	EBA / HFFR compounds / Semiconductive compounds.
E1770	7	17	924	800	12	EBA / Semiconductive compounds.
E17010	10	17	925	830	12	EBA / Semiconductive compounds.
E2735C	3.5	27	927	770	8	EBA / HFFR compounds.
E2770	7	27	926	600	7.5	EBA / HFFR compounds.
E33040	40	33	925	700	3.4	EBA / HFFR compounds.

Wire and cable Ebantix grades



These base resins are suitable for the fabrication of halogen-free flame-retardant (HFFR), semiconductive or other cable compounds





# Base resins for cable compounds

PP block copolymer



Grade	MFI	BA content	Density	Elongation at break	Tensile strength at break	Polymer type / Crosslinking / Description
	ISO 1133 g/10 min 190 °C / 2.16 Kg	Internal method %	ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	ISO 527-2 MPa	
<b>PB130 G1M</b>	1.3	-	905	500	28	PP Block Copolymer / HFFR compounds.
<b>PB140 G2M</b>	3.5	-	905	-	-	PP Block Copolymer / HFFR compounds.

These base resins are suitable for the fabrication of halogen-free flame-retardant (HFFR), semiconductive or other cable compounds



Repsol offers a comprehensive range of products which has been designed according to the standards of the communication cable, optic fiber, and power cables industry requirements





# Repsol Reciclex<sup>®</sup>

LDPE



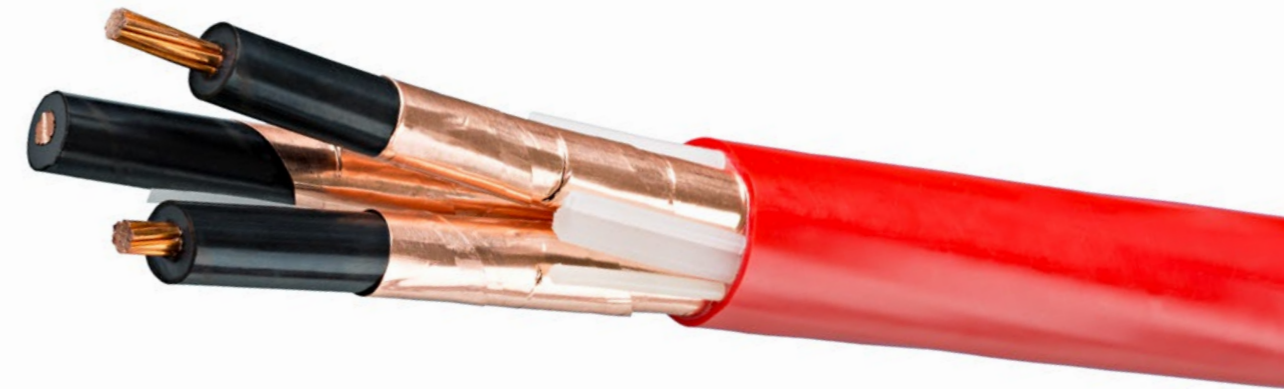
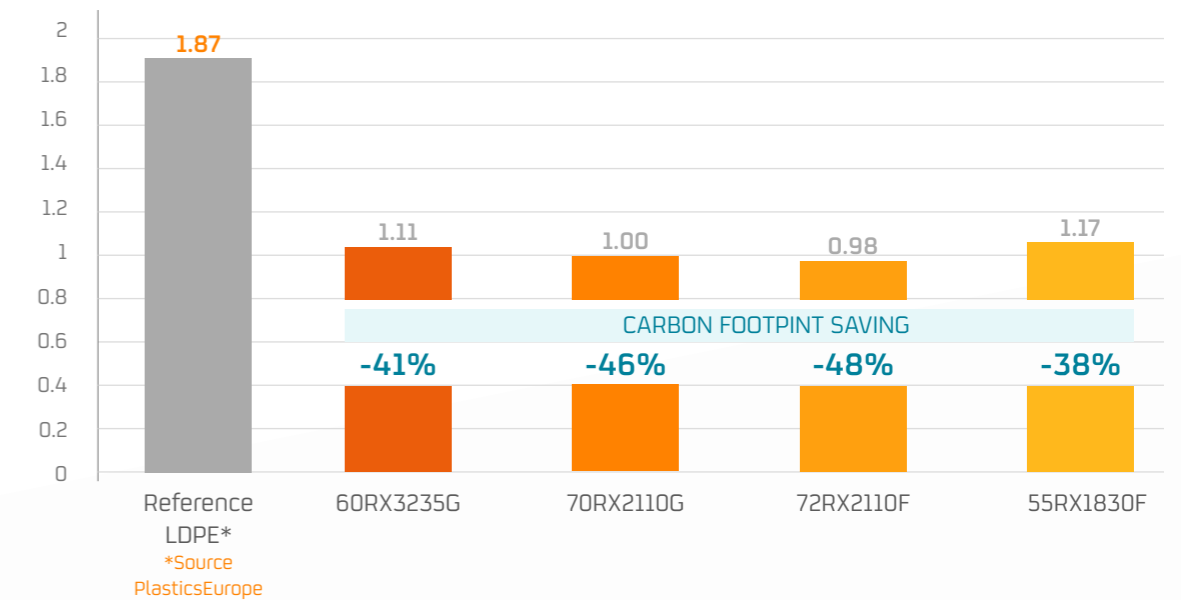
Grade	Recycled material	Similar reference	Color	LLDPE content	MFI	Density	Application
	[%] PCR		ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	g/10 min 190 °C/2.16 Kg	g/cm <sup>3</sup>	
<b>60RX3235G</b>	60	3235FGA	Natural	35-45	2	923	LDPE for jacketing and bedding compounds.

## LLDPE/mLLDPE

Grade	Recycled material	Similar reference	Color	LLDPE content	MFI	Density	Application
	[%] PCR		ISO 1183 Kg/m <sup>3</sup>	ISO 527-2 %	g/10 min 190 °C/2.16 Kg	g/cm <sup>3</sup>	
<b>70RX2110G</b>	70	MF1810FG	Natural	70-85	1.5	923	LLDPE for jacketing and bedding compounds.
<b>72RX2110F</b>	72	MF1810F	Natural	70-85	1	923	LLDPE for jacketing and bedding compounds.
<b>55RX1830F</b>	55	MF1835F	Natural	85-95	3	920	LLDPE for jacketing and bedding compounds.

### Carbon footprint saving

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





# 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.

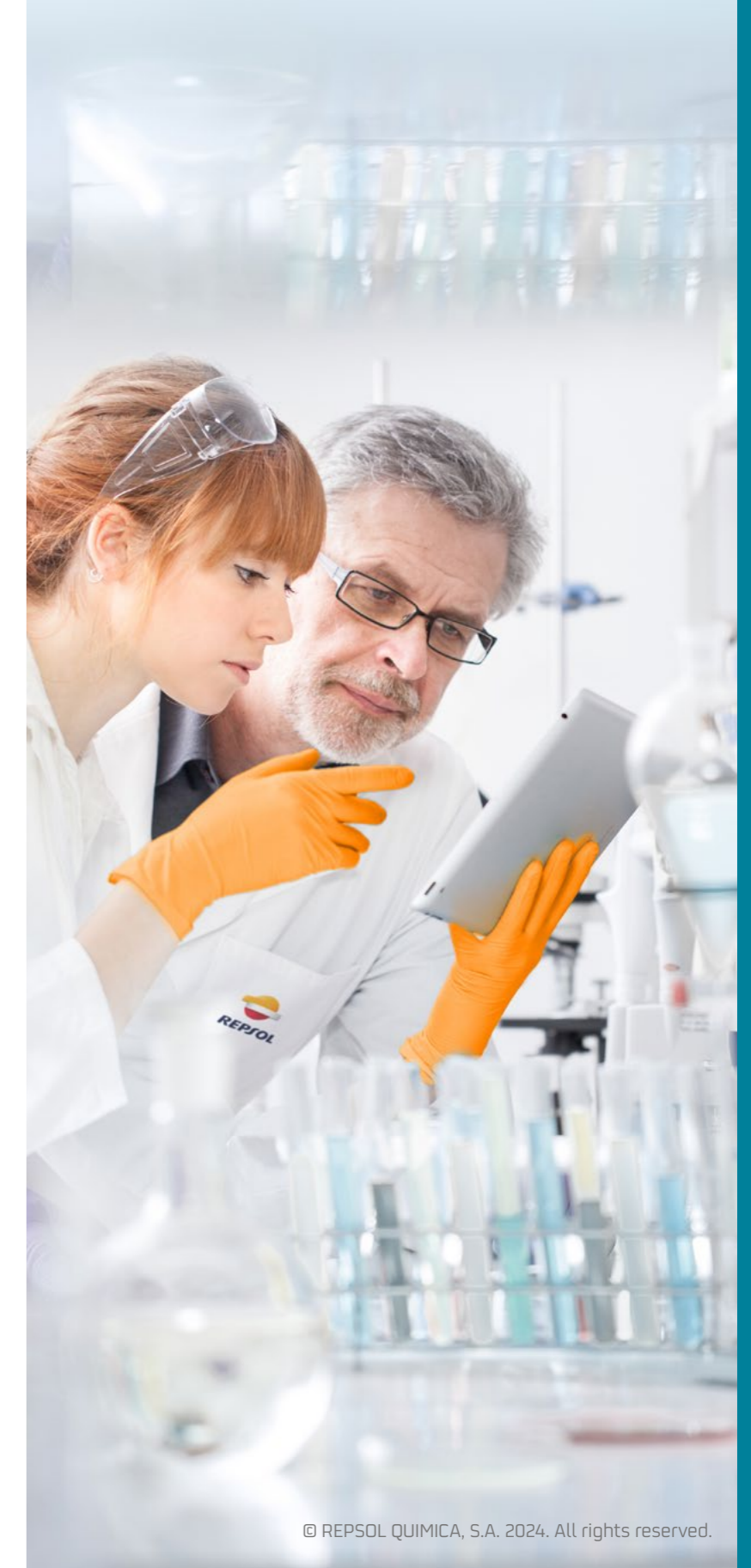
Technical Data Sheets and MSDS are available on: [www.repsol.com](http://www.repsol.com)

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 ISO 45001	All industrial complex FSSC 22000 All petrochemical plants ISO 9001 ISCC Plus	Puertollano, Tarragona and Monzón plants IATF 16949	Puertollano and Monzón plants Recyclclass	Puertollano, Tarragona and Sines ISO 50001 ISO 14001 ISO 14064
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# 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<sub>2</sub> 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<sub>2</sub> 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.

*Efficiency*

*Respect*

*Foresight*

*Value-oriented*





## Chemicals Customer Care

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