

# Asia *Circulen*Recover



# LYB Mechanical Recycling Plant – Guangdong Genox LyondellBasell New Material



## Key benefits

- Localized production base
- High-quality recycling plastic products
- Sustainable solutions
- Terminal applications in multiple scenarios
- Customized and innovative product development
- Excellent technical support and service

Guangdong Genox LyondellBasell New Material Co., Ltd. is a 50:50 joint venture (JV) between LyondellBasell (LYB) and Genox Recycling (Genox). The plastic recycling plant uses mechanical recycling technology to recycle plastic waste and produce new polymers, adding to the LYB *CirculenRecover* product portfolio.







### The joint venture aims to:

- Reduce the amount of plastic waste sent to landfills, incinerators, or released into the environment
- Support the growing demand for recycling and sustainable solutions
- Promote the high-quality development of the local plastics recycling value chain

Leveraging LyondellBasell expertise in polyolefin development and Genox experience in solid waste resource utilization, the joint venture creates innovative solutions for the circular economy. By integrating local and global resources, the collaboration will unlock new possibilities for our customers and brand owners.

LYB is responsible for marketing the recycled polyolefin products under its *CirculenRecover* portfolio.

## Product applications

-  Films
-  Industrial packaging
-  Flexible packaging
-  Daily-use packaging
-  Injection molding
-  Modification
-  Furniture
-  Outdoor products

# Circulen Family of Sustainable Solutions

The global portfolio is organized into three primary and complementary categories; *CirculenRecover*, *CirculenRevive* and *CirculenRenew*.



## **CirculenRecover**

CirculenRecover products are made from plastic waste through a mechanical recycling process and 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 products and packaging applications.



## **CirculenRevive**

CirculenRevive products are made using a chemical 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, using an ISCC PLUS-certified mass balance approach. These polymers can be used in highly regulated applications, such as food contact and healthcare.



## **CirculenRenew**

CirculenRenew products are made from renewable feedstocks derived from bio-based wastes and residual oils, using an ISCC PLUS-certified mass balance approach. The use of renewable feedstocks offers a lower carbon footprint, compared to fossil-based feedstocks, and the polymers can also be used in highly regulated applications such as food contact and healthcare.

Learn more at [LyondellBasell.com/Circulen](https://www.lyondellbasell.com/Circulen)

# Circulen Recover

Plastics make modern society possible and often are a more sustainable material than alternatives. LyondellBasell recognizes the challenges of plastic waste and is launching products that help customers achieve circularity in their use of plastic packaging by increasing usage of recycled content and diverting more plastic from landfill or incineration. **We are committed to producing and marketing at least 800,000 metric tons of recycled and renewable based polymers annually by 2030.** We are advancing technologies and innovations that will help eliminate plastic waste and maximize the value of plastics by keeping these resources in use for as long as possible.

## Polyethylene and Polypropylene products containing Post Consumer Resin (PCR) for the following

### Injection Molding

- Caps and closure
- Crates, pails, containers, houseware, outdoor furniture, luggage, sports equipment

### Blow Molding

- Bottles for consumer goods

### Flexibles

- Collation shrink film
- Hygienic film



# Unlock the value of **Circulen**Recover

LyondellBasell is investing across the value chain – from collection to offtake to production – to ensure the reliable supply of high-quality feedstock necessary to deliver meaningful circular and low carbon solutions to our customers. Our *Circulen*Recover grades are specifically designed to fulfill the unique needs of multiple stakeholders across your organization while also addressing the most pressing demands of your customers and consumers.

- Long term supply contracts
- Reliable feedstock supply



- A Single Pellet Solution offers benefits over dry blends

- Regulatory/product safety assessment
- Higher PCR incorporation
- Improved product consistency
- Lower gels

- Carefully tested and screened to ensure quality and consistency of raw materials
- Performance characteristics of existing virgin resins

- Robust Product Stewardship process
- Complete package of solutions with virgin, PCR, and masterbatch offerings

- Helps meet customer and consumer demand for PCR content, landfill diversion, and lower GHG emissions
- Collaboration across the value chain
- Responsibly sourced polymers

# Circulen Recover product grades for Asian market

Circulen Recover PP							
Grades	MFR 230° C, 2.16kg [g/10min]	Ash 600° C, 30min [%]	Density [g/cm <sup>3</sup> ]	Tensile Strength 23° C [MPa]	Flexural Modulus 23° C [MPa]	Charpy Impact Strength 23° C [kJ/m <sup>2</sup> ]	Source
PP300K C White	4	0.3	0.901	22	1000	50	PCR
PP300K C Ivory	4.5	1.5	0.912	23	1050	40	PCR
PP302N C Ivory	11	2.0	0.907	21	1180	12	PCR
PP300S C White	28	1.4	0.91	24	1290	7.5	PCR
PP300S C Ivory	33	2.0	0.915	24	1300	6.5	PCR
PP300S C Grey	26	4.0	0.93	26	1290	5.5	PCR
PP300S C DG	25	4.3	0.931	25	1300	5.0	PCR
PP200J C White	7	0.1	0.905	28	1150	4.0	PIR
PP500N C Crystal	12	0	0.905	34	1450	3.0	PCR
PP330R C White	20	0.1	0.905	30	1600	3.0	PCR
PP400T C White	55	0.1	0.905	33	1450	2.3	PCR
PP500T C White FN	55	0	0.907	34	1500	2.8	PCR
PP240N C Crystal	11	0	0.900	24	850	6	PCR
PP400N C Crystal FN	10	0	0.905	32	1350	3.0	PCR

Circulen Recover HDPE							
Grades	MFR 190° C, 5.0kg [g/10min]	Ash 600° C, 30min [%]	Density [g/cm <sup>3</sup> ]	Tensile Strength 23° C [MPa]	Flexural Modulus 23° C [MPa]	Charpy Impact Strength 23° C [kJ/m <sup>2</sup> ]	Source
HD5603 C White	0.3	0.2	0.955	29	1200	8.0	PCR
HD5603 C Ivory	0.3	2.2	0.97	29	1200	5.5	PCR
HD5603 C Grey	0.4	2	0.967	28	1100	5.0	PCR
HD5603 C DG F	0.3	1.7	0.965	27	1100	5.5	PCR
HD54310 C White	6.0(21.6kg)	0.5	0.943	26	1120	22	PCR
HD5603 C White FN	0.3	0	0.955	29	1200	8.0	PCR
HD5603 C Ivory FN	0.3	2.0	0.968	29	1200	6.0	PCR
HD3835 C White FN	3.5	0	0.938	28	900	7.0	PCR
HD55209 C White FN	9.0(21.6kg)	0.3	0.952	26	1120	22	PCR

Circulen Recover LDPE / LLDPE							
Grades	MFR 190° C, 2.16kg [g/10min]	Ash 600° C, 30min [%]	Density [g/cm <sup>3</sup> ]	Tensile Strength 23° C [MPa]	Elongation at Break [%]	Dart Drop [g]	Source
LD1815 C Crystal	1.5	0	0.918	MD: 22 - TD: 18	MD: 200 - TD: 580	74	PIR
LD2110 C Crystal	1.0	0.3	0.920	MD: 31 - TD: 29	MD: 600 - TD: 800	104	PCR
LD2305 C White	0.5	0	0.923	MD: 27 - TD: 17	MD: 120 - TD: 640	42	PIR
LL3503 C Grey	0.3	4.0	0.935	MD: 24 - TD: 19	MD: 470 - TD: 520	250	PCR
LL2015 C White	1.5	0	0.92	MD: 24 TD: 21	MD: 660 - TD: 630	70	PCR

# About Us

We are LyondellBasell (LYB) – 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.lyb.com](http://www.lyb.com) or follow [@LyondellBasell](https://www.linkedin.com/company/lyondellbasell) on LinkedIn.

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