

# LETZero Product Book

 RECYCLED

 COMPOSTABLE

 BIO



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For printing this LETZero product book, we refrained from spot color printing and coating processes at the design stage to minimize environmental pollution and waste of resources during the printing process. It is made from FSC-certified eco-friendly pulp and uses eco-friendly soybean oil ink during the printing process to minimize harmful ingredients.





## LG Chem's Eco-Friendly Materials Brand - LETZero

LETZero means helping zero environmental footprints and reaching net-zero carbon emissions by combining 'Let + Zero'.

LETZero is a master brand that integrates eco-friendly products such as recycled materials made of reprocessed waste plastics, bio materials made of plant-based renewable materials, and compostable materials made of glucose and waste glyceryl extracted from corns.

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## LETZero Brand



LET and Zero (0)

### Brand Name

LETZero, LG Chem's eco-friendly materials brand, is a compound word of "Let" and "Zero" that reflects our determination to "turn substances that are harmful to the environment and the net increase in carbon emissions into zero."

### Brand Design

The "O" represents our heartfelt promise for a sustainable environment and future, visualizing how LG Chem creates a healthier future to coexist with the Earth.

### Brand Color

LETZero Jade  
Pantone 7466C

C90 M10 Y30 K0  
R0 G154 B177  
#009AB1

LETZero Green  
Pantone 381C

C30 M0 Y80 K0  
R199 G214 B79  
#C7D64F



# LETZero Product

LETZero is a brand that reflects our determination to create a sustainable future where humans can coexist with nature. Through LETZero, we aim to reduce carbon emissions that pollute the environment and help resolve the harmful effects on the Earth's ecosystem.

Our products are divided into three main categories:

We have recycled materials made of reprocessed waste plastics, bio materials made of plant-based renewable materials, and compostable materials made of glucose and waste glyceryl extracted from corn. LG Chem will start the journey toward Zero (0) with LETZero for world's better future.



## Recycled

Recycled materials are plastic materials produced by collecting, sorting, and pulverizing waste plastics, which are recycled using LG Chem's mechanical and chemical recycling technology.

### Key Materials

- Mechanical Recycling**
- PCR ABS, PCR PC, PC/ABS, PCR PE, PCR PP, PCR PVC, OBP
- Chemical Recycling**
- Circular Balanced Materials



## Compostable

Compostable materials are eco-friendly compostable plastics that naturally decompose into water and carbon dioxide by micro-organisms within a few months.

### Key Materials

- COMPOSTFUL™, PLA, PLH



## Bio

Bio materials are eco-friendly materials that incorporate plant-based bio ingredients in the production process, which significantly reduces the carbon footprint.

### Key Materials

- Bio-Circular Balanced**
- SAP, NPG, IPA, Acrylates, ABS, PE, PP, PC, PC/ABS, PVC, NBL, BR, SSBR
- Bio-based**
- Bio-PA, PLA



# Recycled Materials

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## Reusing materials through mechanical and chemical recycling

LG Chem produces post-consumer recycled materials, which are made by mechanically recycling waste plastics, as well as circular balanced materials made by chemically restoring waste plastics back to their original material state. The two methods function in complementary ways, and as opposed to waste treatment methods such as landfilling and incineration, this virtuous cycle of resources minimizes damage to the environment.

PCR

Circular  
Balanced



Korean traditional furniture, 'Soban' made of recycled plastic

## Mechanical Recycling Post-Consumer Recycled



### Eco-friendly plastic, as good as new

PCR refers to “post-consumer recycled” materials, which are recycled from plastics that are discarded by end consumers after use.

LG Chem sorts plastics from end-of-life products such as discarded TVs, computers, and refrigerators and mechanically reproduces plastic materials that are as good as new. The PCR plastics produced by LG Chem have been certified for their PCR content by eco-friendly certification organizations such as UL ECV (Environmental Claims Validation), TUV (Technical Inspection Association), and GRS (Global Recycled Standard).





# PCR ABS

## Post-Consumer Recycled Acrylonitrile Butadiene Styrene

LG Chem was the first to develop high-quality white PCR ABS using recycled ABS (acrylonitrile butadiene styrene). LG Chem's PCR ABS maintains excellent physical properties after repeated use.



Conventional PCR ABS is made of recycled ABS with multiple colors, generally resulting in dark or black coloration. This has restricted its applications, for instance, on the exterior of white home appliances. In August 2020, LG Chem became the first in the world to successfully develop and mass-produce PCR ABS in white color with physical properties equivalent to existing products. For producing white PCR ABS, light-colored plastics need to be sorted out before the pulverization process. Selecting and blending white pigments also require a high level of technology. LG Chem has standardized the screening process for recycling ABS, and through proprietary technology, is mass-producing perfectly white-colored material with quality equivalent to that of existing ABS.



Remote control made of PCR ABS



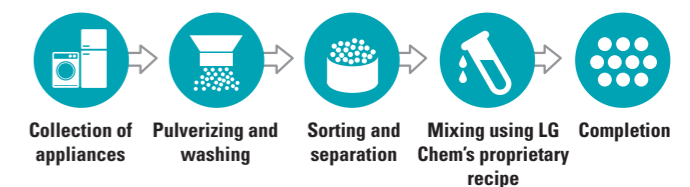
Color samples of PCR ABS

### Main Product Features

- It helps protect the environment by using discarded home appliances as raw materials, reducing plastic waste.
- Less incineration of plastic means less fine dust and greenhouse gas emissions.
- It can be produced in bright colors, even white, which is applicable to the exterior of white home appliances.
- It has excellent retention of physical properties after multiple extrusions and has thermal stability and chemical resistance comparable to virgin products.

### Manufacturing Process

LG Chem currently produces PCR ABS products using mechanical recycling. When recycling plastic, it is key to singularly sort out ABS from discarded plastic products. Then, once impurities are removed from recycled plastics, raw materials created by LG Chem's proprietary technology are mixed to produce the final product.



### Scope of Applicability

In addition to home appliances and various electronic devices, the demand and uses of PCR ABS are diversifying day by day, from automobiles to building materials. LG Chem's R&D efforts focus on various product applications that our customers want.

### Main Applications

Appliances such as TV, copying machines, and air purifiers

# PCR PC & PC/ABS

## Post-Consumer Recycled Polycarbonate



In 2009, LG Chem commercialized PCR PC and PC/ABS products from recycling engineering plastics called Polycarbonate (PC). By producing 50% PCR PC/ABS products, about 40% of carbon emissions was reduced compared to existing products.



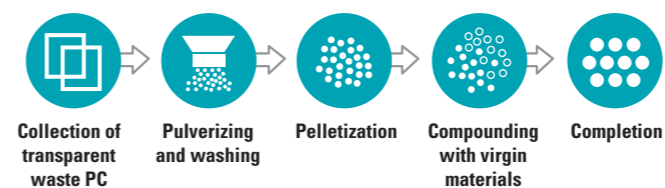
PC is an engineering plastic that can replace metal and ceramics as an industrial material. The material is transparent, 150 times stronger than tempered glass, and withstands heat above 120°C. PCR plastics are produced with relatively less energy because they are made by recycling used plastics that are discarded. Using less energy means emitting less carbon, and recycling discarded products further reduces waste and helps protect the environment.

### Main Product Features

- It helps protect the environment by recycling discarded transparent PC, reducing plastic waste.
- We produce PCR PC using up to 90% recycled PC and compounded PCR PC/ABS using up to 80% recycled PC.
- We have achieved the same level of impact resistance, heat resistance, and transparency as virgin materials with high content of recycled materials.
- Our PCR products are 150 times stronger than tempered glass and withstand heat over 120°C. They are easy to process and have excellent color expression and durability, allowing the versatility of applications in product exteriors.

### Manufacturing Process

It is essential to establish an assured process that singles out transparent PCs from a pool of plastics. After collecting and crushing transparent waste PC, it is washed and pelletized. Then, it is mixed with virgin materials at a specific ratio to produce the final PCR product.



### Scope of Applicability

Thanks to its excellent impact resistance, heat resistance, and processability, it has wide applications in making electronic devices, such as laptops and AI speakers, and automobile interiors and exteriors.

### Main Applications

Laptops, TV, multi-function devices, network equipment, IT appliances, adapters, chargers, industrial materials, automotive interior and exterior materials, exterior building materials



TV set-top box made of PCR PC



Korean traditional furniture, 'Soban' made of PCR PC/ABS

# PCR PE & PCR PP

## Post-Consumer Recycled Polyethylene & Polypropylene

LG Chem produces PCR PE and PCR PP by recycling Polyethylene (PE) and Polypropylene (PP).

PE is a common material used in food handling, industrial and agricultural films, and containers for household goods, and PP has diverse purposes from automotive materials to medical applications.



LG Chem has developed high-quality PCR PE and PCR PP by recycling PE and PP, which are general-purpose plastics widely used in our daily lives. Our PCR products reproduce the same level of quality as existing virgin materials, making them perfectly applicable to existing applications. PCR products range from film to injection types, which can be applied to a wide variety of products desired by customers.

### Main Features

- It helps protect the environment by using discarded home appliances as raw materials, reducing plastic waste.
- Less incineration of plastic means less fine dust and greenhouse gas emissions.
- Our products achieved physical properties equivalent to the quality of virgin materials despite the high content (80 to 50%) of recycled materials in each product.

### Scope of Applicability

LG Chem's PCR PE and PP can be applied to packaging materials of various shapes and uses, such as packaging films, containers, and lids. We have developed several such product groups, and are accelerating our efforts to research and develop an even wider range of applications.

### Main Applications

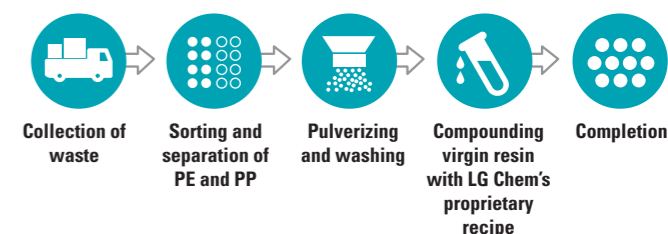
PCR PE: Flexible packaging materials, stretch wraps, heavy-duty bags, blow-molded containers, and injection molded products (pallets, crates, etc.)

PCR PP: Injection molded containers and caps

### Manufacturing Process

LG Chem produces PCR PE and PP products through mechanical recycling.

PE and PP are plastics widely used in the home and industries, including disposable products, logistics, and appliances, accounting for the majority of plastic waste. In recycling these, the most critical process is sorting and separating. Then, the pulverizing and washing process removes impurities, and these recycled plastics are mixed with raw materials created by LG Chem's proprietary technology for making the final product.

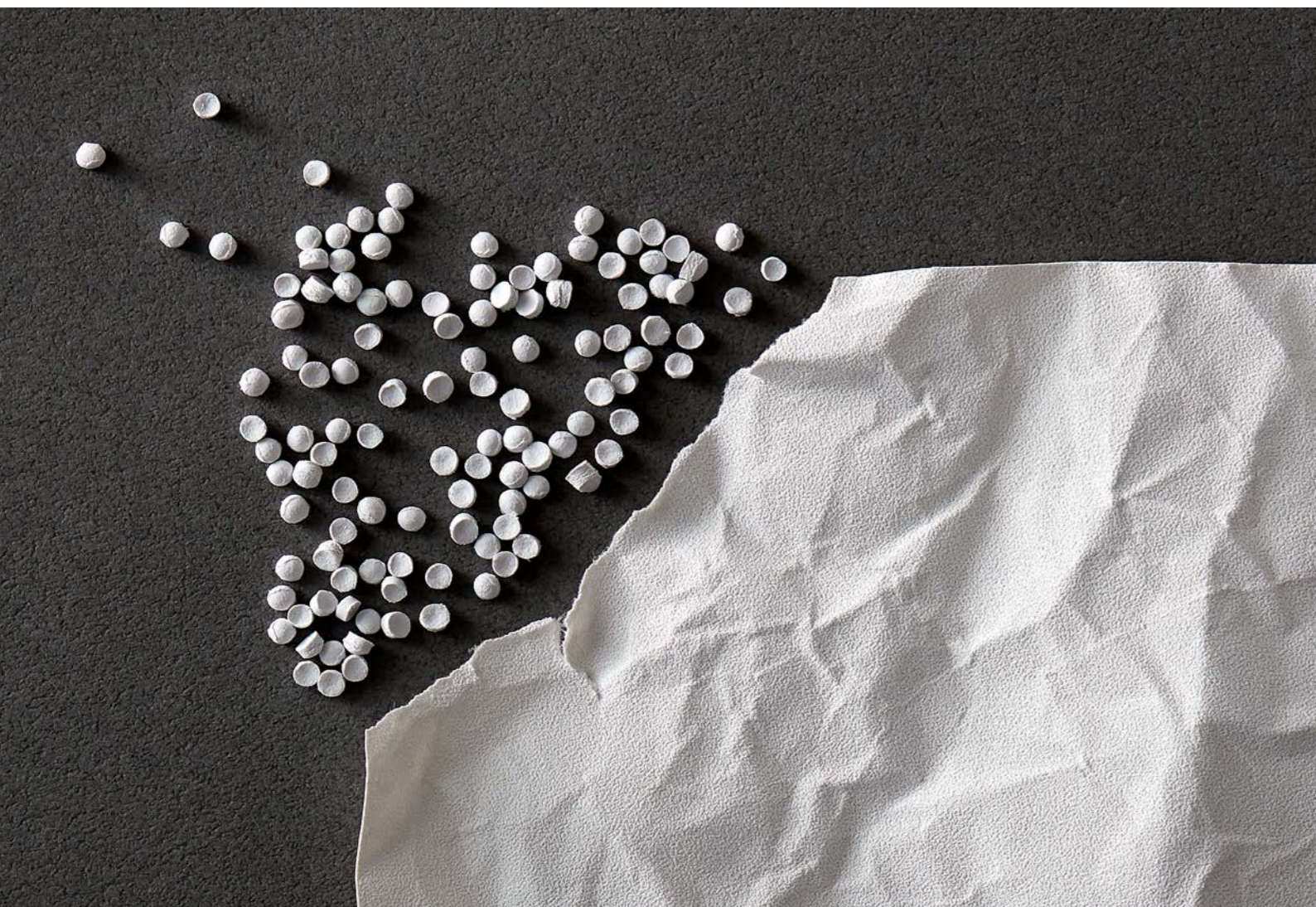


PCR PP



PCR PE





# PCR PVC

## Post-Consumer Recycled Poly Vinyl Chloride

PVC is a typical general-purpose thermoplastic with a broad range of applications, from building materials to household products. Since 2023, LG Chem has been producing PCR PVC by separating and extracting PVC from PVC products made of different materials that are difficult to recycle, such as waste wallpaper, waste tarpaulin, and waste artificial leather.



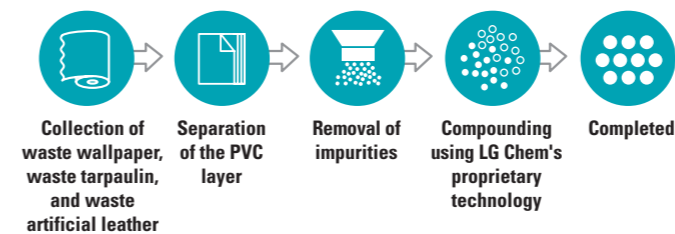
Recycling of PVC was limited to certain general-purpose products such as pipes, chassis, flooring, and wires. Most other PVC used in household goods were buried at landfills or incinerated. LG Chem has established a system of virtuous cycles for collecting, sorting, and recycling waste wallpaper, waste tarpaulin, and waste artificial leather products that would otherwise be incinerated or landfilled. Most PVC products used in daily life are mixed with various materials such as paper and PET and require technology to produce high-purity products. In collaboration with customers and recyclers, LG Chem collects, sorts, and recycles waste PVC products that are difficult to recycle and achieves the same level of quality as existing PVC raw materials, which are then applied to various products.

### Main Features

- By utilizing waste wallpaper, waste tarpaulin, and waste artificial leather that would otherwise be landfilled or incinerated, it reduces the amount of plastic waste and helps protect the environment.
- The carbon footprint from the manufacturing process is reduced by approximately 40% compared to conventional PVC.
- PCR PVC in powder and pellet form is made of up to 100% recycled PVC.
- We are continuously expanding the development and application of eco-friendly products in conjunction with local communities. For example, in Hwaseong-si, Gyeonggi-do, we are implementing a demonstration project to establish a collection system for recycling PVC waste wallpaper.

### Manufacturing Process

We create recycled raw materials by isolating PVC through mechanical and physical methods from waste PVC products consisting of multiple materials. The final PCR product is then subjected to quality enhancement processes such as impurity removal and compounding to produce pellets and powders.



### Applications

LG Chem's high-purity PCR PVC enables the production of new products that are identical to the existing products, creating an inner cycle for the specific product. In addition to producing identical products, it can also be applied to a wide array of products that are conventionally used in everyday life, such as flooring and bags.

### Main Applications

Flooring, tarpaulins, and artificial leather (car seats, sofas, bags, and notebooks)



PCR PVC in pellet and powder form

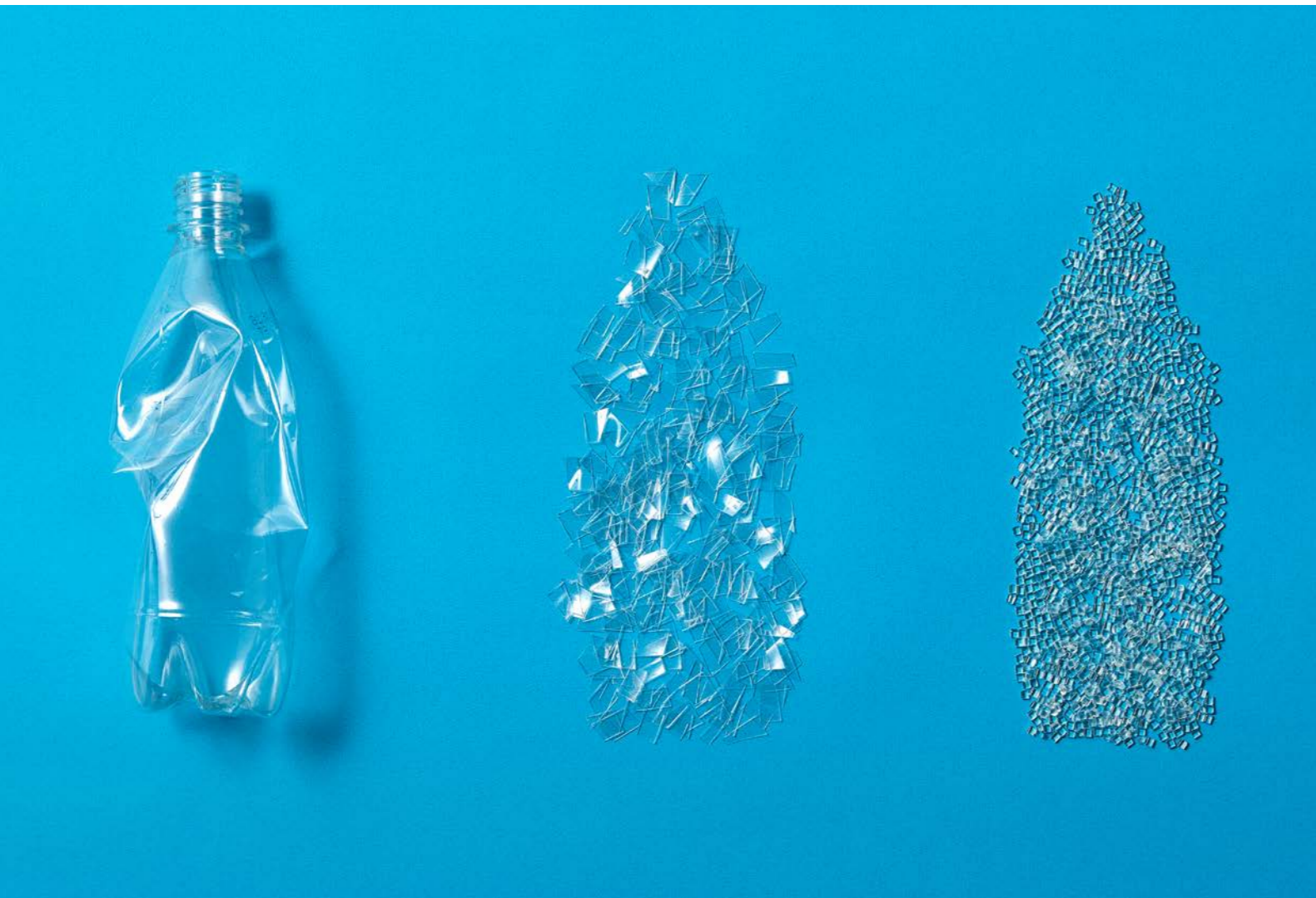


PCR PVC from recycled tarpaulin bags

# OBP

## Ocean Bound Plastic

**Ocean-bound plastic (OBP) is plastic waste defined as “plastic that is at the risk of entering the ocean.”** Plastic waste near shorelines may enter the ocean due to rain, wind, tides, river flow, and flooding. OBP can be recycled into a variety of recycled plastics through the process of screening, sorting, and cleaning.



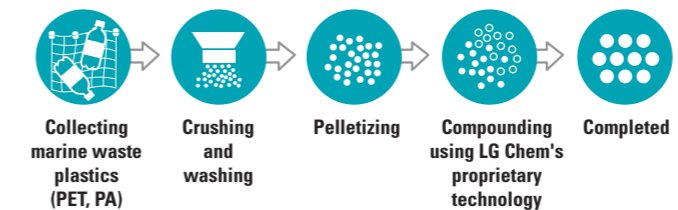
Ocean-bound plastic (OBP) refers to plastic waste of any size that has been discarded within 50 kilometers of the coast. Recycling OBP prevents plastics from entering the ocean and becoming marine waste and, in turn, protects marine life. LG Chem produces recycled plastics from materials such as discarded fishing nets and plastic bottles within 50 kilometers of the coast to help conserve marine ecosystems.

### Main Features

- Producing recycled plastics from plastic trash that may enter the ocean is a significant contribution to protecting the marine ecosystem.
- We produce OBP PET and OBP PA products by recycling used fishing nets and used plastic bottles, which make up the largest portion of marine waste.
- The entire supply chain of OBP, from collection to final product manufacturing, is verified by an eco-friendly certification organization.

### Manufacturing Process

We collect discarded fishing nets (PA) and plastic bottles (PET) within 50 kilometers of the coast and sort them by attributes such as material and color. Then, impurities are removed from the PA nets and PET bottles through a crushing and washing process. LG Chem's technology is applied to the recycled OBP raw materials to produce the final OBP products.



OBP PET and OBP PA pellets made from marine waste PET bottles and fishing nets

### Applications

Waste plastic bottles and discarded fishing nets collected near the coast are crushed and cleaned to form pellets, which are then compounded with various engineering plastics using LG Chem's proprietary technology. Now, they can be reused to create components for multiple industries, from interior and exterior materials for electronic products to automotive parts.

### Main Applications

OBP PET: Furniture, electronics, and automotive components  
 OBP PA: Smartwatches, switches, and automotive parts



Circular pyrolysis oil and refined pyrolysis oil derived from waste plastics through chemical recycling.

# Chemical Recycling

## Circular Balanced Materials

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### Returning plastics to their raw material state through chemical recycling

Waste plastic film and composite plastics that are difficult to recycle mechanically are chemically recycled to produce circular pyrolysis oil. This oil is used in the production of several plastic materials by replacing fossil fuel based raw materials. Circular balanced materials, produced from LG Chem's circular pyrolysis oil, have the same level of quality as conventionally produced plastics and have acquired the ISCC Plus (Circular Economy) certification.



# Circular Balanced Materials

Through chemical recycling, LG Chem recycles low-quality or composite plastics that are difficult to recycle using the conventional mechanical recycling method. Through chemical recycling, waste plastics can be returned to the initial raw material state and reproduced into plastics of the same quality as conventional plastics.



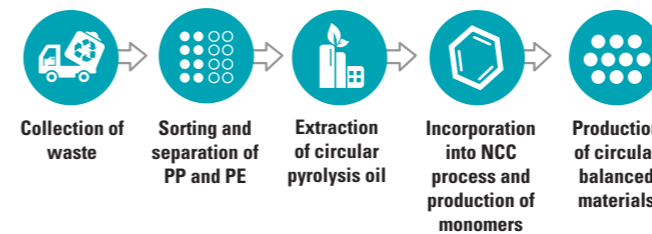
Chemical recycling is a method of decomposing waste plastics through chemical processes and recycling them into basic raw materials or polymers. Through supercritical pyrolysis technology, LG Chem is able to produce circular pyrolysis oil from waste plastics, which can be re-injected into the process to produce circular balanced materials.

## Main Features

- Plastics produced by chemical recycling have the same quality as regular plastics and do not deteriorate even after repeated recycling.
- Composite polyethylene (PE) and polypropylene (PP) plastics, such as snack bags and plastic lids, were previously difficult to recycle. Now, using supercritical pyrolysis technology, they can be turned into circular pyrolysis oil, which can be recycled into plastic.
- The circular pyrolysis oil obtained through chemical recycling can be fed into NCC to produce a variety of circular balanced materials.

## Manufacturing Process

Supercritical pyrolysis utilizes high-temperature and high-pressure water vapor to break down waste plastics. Through the pyrolysis of snack bags, plastic lids, and containers of ready-to-eat meals that are difficult to recycle, the material can be fed into the petrochemical manufacturing process. For 10 tons of plastic film and plastic waste, about eight tons of circular pyrolysis oil can be extracted, and the remaining two tons of by-product gas can be reused as energy to run the plant.



## Future Plans

- 2023 / Construction started for a supercritical pyrolysis oil plant in Dangjin, South Chungcheong Province
- 2024 / Completed the construction of Dangjin Plant (20,000 tons of annual production capacity)



Circular balanced synthetic rubber made from circular pyrolysis oil



# Compostable Materials

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## It comes from nature and returns to nature.

LG Chem is taking the lead in developing bio materials using plant-based materials and compostable materials that decompose in the ground within a few months. In line with global trends such as regulations on disposable products, increasing demand for compostable materials, and reducing carbon emissions, we are developing bio and compostable products for diverse applications, from plastic bags to disposable cups.

# COMPOSTFUL™

Based on LG Chem's differentiated technology and domestic production of raw materials, the compostable material solution COMPOSTFUL™ provides various grades to meet customer needs. COMPOSTFUL™ has acquired global compostability certifications and complies with food contact material regulations.



COMPOSTFUL™, LG Chem's compostable material solution, is a bioplastic that composts in six months to two years under specific conditions. LG Chem is developing compostable biomaterials that can be applied to a variety of fields in response to single-use plastic regulations and the growing demand for compostable materials.

COMPOSTFUL™ Compostable Certification



Launched in 2023, COMPOSTFUL™ is a certified compostable product in the United States and Europe.

## Product Features and Technical Support

- LG Chem directly produces various compostable raw materials (PBAT, PBS, and PLA) and also provides customized compounds.
- We offer user guides by end-use and processing method.
- It has acquired global compostability certifications\* and is compliant with European food contact regulations.

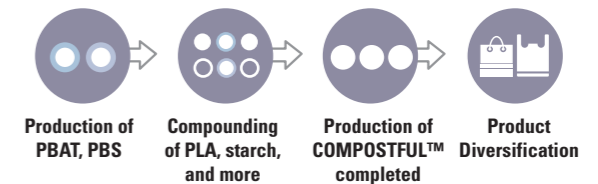
\*Additional grade certifications/evaluations in progress

## Grade Information

- COMPOSTFUL™ SF1000 | For compostable compounding, certified for industrial composting (North America, Europe)
- COMPOSTFUL™ SF2110 | For soft materials
- COMPOSTFUL™ SF2110M | For agricultural mulch film

## Manufacturing Process

COMPOSTFUL™ is a compostable solution produced by LG Chem. We produce compostable materials (PBAT, PBS) through polyester polymerization technology and compound them with bio-based compostable materials such as PLA (polylactic acid) and starch to produce materials that are suitable for applications and customer needs.



## Main Features

Its high flexibility allows the material's application in films, such as agricultural mulch films and disposable bags. When compounded with PLA (polylactic acid) and starch, it exhibits processability and strength similar to conventional plastic materials such as PE and PP.

## Main Applications

Shopping bags, agricultural mulch films, parcel packaging, food packaging, paper coatings, coffee capsules, and other films

## Future Plans

- 2023 / 3,000 tons of prototype production (Korea)
- 2024 / 50,000 tons of annual production (Korea)
- 2028 / Increase annual production to 100,000 tons

# PLA

## Poly Lactic Acid



PLA is one of the most widely produced bioplastics using plant-based materials. It is a Biobased material decomposed by microorganisms within a few months under certain conditions. Because the material has high stiffness and can be easily incorporated into other materials, it is used in various products by compounding with other polymers with high flexibility, such as PBAT.



PLA is a bioplastic produced from plant-based materials such as corn and sugar cane, as well as a compostable plastic decomposed by microorganisms. Because it features both characteristics, it can contribute to reducing carbon emissions and solving the plastic waste problem. The PLA product market is also expected to grow rapidly as the demand for bio and compostable plastics increases due to the recent reinforcement of plastic regulations worldwide.

### Main Features

- PLA is produced from lactic acid as the raw material by fermenting corn or sugarcane. PLA is harmless to the human body and is used for food packaging containers, tableware, and medical materials.
- Because the material has high stiffness and is prone to breakage, it is compounded with other compostable plastics with high flexibility, such as PBAT, to improve the physical properties.

### Manufacturing Process

PLA is produced from lactic acid, obtained by fermenting glucose extracted from corn starch or sugarcane. After converting lactic acid to lactide, its cyclic form, PLA is manufactured through a polymerization process. Depending on the mixture of raw materials and the polymerization process, PLA can be produced into various grades. It can have diverse applications through compounding with other materials that can compensate for its weaknesses in physical properties.



### Applications

With properties harmless to the human body, it is mainly used for food packaging and tableware. PLA with improved heat resistance can be applied to various purposes, such as disposable products.

### Main Applications

Various disposable plastics, food containers, and cutlery

### Future Plans

- 2025 / 1,000 tons of prototype production
- 2026 / 75,000 tons of annual mass production



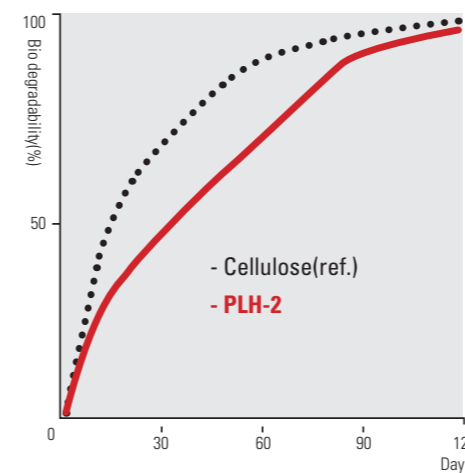
# PLH

## PolyLactate-co-Hydracrylate

PLH, developed by LG Chem, is a compostable material with 100% bio content using corn glucose and waste glycerol. It is the only material that satisfies high levels of flexibility, transparency, and biodegradability as a single material.



Existing compostable materials had to be mixed with other plastic materials or additives to enhance their physical properties and flexibility, which resulted in differentiated quality and price for each product. However, PLH developed by LG Chem is a single material that has improved flexibility by up to 20 times compared to existing compostable products and maintains transparency even after processing. It has a wide range of applications in plastic bags, bubble wraps, disposable cups, foam products, and non-woven fabrics for masks.



Graph of DIN CERTCO\*'s test results on PLH's biodegradability

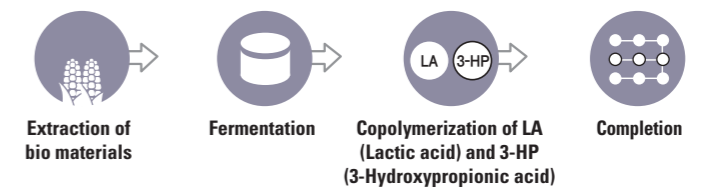
\*International certification body for compostable materials in Germany

### Main Features

- It is a compostable material with 100% bio content using corn glucose and waste glycerol.
- DIN CERTCO, an international certification body for compostable materials in Germany, confirmed that 90% of the material is compostable within 120 days.
- It is a single material that is up to 20 times more flexible than conventional compostable products while maintaining transparency.

### Manufacturing Process

PLH is a compostable material originally developed by LG Chem, produced from 100% bio materials. 3-HP (3-Hydroxypropionic acid), one of the monomers used to polymerize PLH, is produced by microbial fermentation using biomass. As 3-HP is difficult to produce with high purity and high yield, and the purification process is complicated, no one had successfully mass-produced materials using the monomer. After many years of research, we have acquired the production and purification technology of 3-HP. This enabled the development of new compostable materials with improved flexibility while maintaining transparency.



### Scope of Applicability

Adjusting the structure of new materials allows us to implement mechanical properties according to their use. By varying their grades, we are researching the application of these new materials to packaging, such as films, containers, and disposable cups that use existing compostable materials.

### Main Applications

Films, disposable cups, bubble wraps, etc.

### Future Plans

- 2021 / Research and development
- 2022 / Investment and production
- R&D for mass production in progress





# Bio Materials

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## We reduce carbon emissions with Bio-renewable feedstock.

LG Chem uses bio-renewable feedstock derived from renewable materials in combination with fossil-based oil to produce various products. We are the first in Korea to acquire the ISCC Plus certification on 58 eco-friendly products, including SAP (Super Absorbent Polymer), PO (Poly), ABS (Acrylonitrile Butadiene Styrene), and PVC (Polyvinyl Chloride). The certification includes the entire process, from raw material procurement to production, purchase, and sales (as of July 2023). Building upon this achievement, LG Chem continues our efforts to reduce carbon emissions in terms of LCA (Life Cycle Assessment), which evaluates all environmental impacts from raw material production to product shipment.



It is an eco-friendly bio product manufactured by mixing fossil-based oil with bio-renewable feedstock extracted from plant-based renewable oil. LG Chem was the first in Korea to acquire ISCC Plus certification for a total of 58 bio-circular balanced products, including SAP (Super Absorbent Polymer), PO (Polyolefin), and PC (Polycarbonate) compounds (as of July 2023). The reduction of carbon emissions from bio-circular balanced SAP products, measured through LCA (Life Cycle Assessment), which evaluates all environmental impacts from the production of raw materials to product shipment, reached 111%\* compared to existing products.

\*Based on 100% allocation of bio materials input by Mass balance principles as verified by the Korean Society for Life Cycle Assessment (KSLCA). The amount of carbon reduction is based on the standards that include the cradle-to-gate production stages, and in the case of bio materials, the amount of carbon dioxide (CO<sub>2</sub>) absorbed by plants is taken into account when calculating greenhouse gas emissions.

### Main Features

- Bio-renewable feedstock extracted from Bio-based renewable oil is incorporated with fossil-based oil to reduce carbon emissions dramatically in the manufacturing process.
- We established a stable supply chain of raw materials by concluding a strategic partnership with Neste, the world's largest producer of bio materials.
- We have acquired the ISCC Plus certification, an international authentication that meets the Renewable Energy Directive of the European Union (EU), which is the world's strictest standards of its kind.

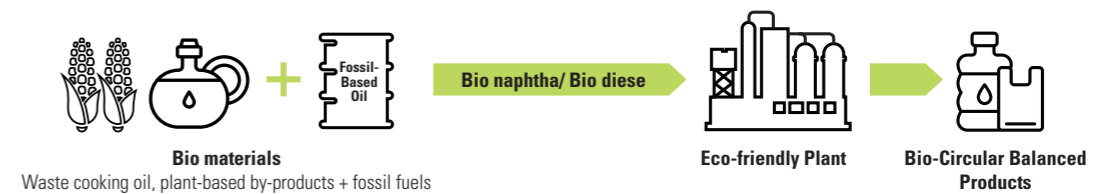
### Manufacturing Process

We produce eco-friendly products using the same existing petrochemical production infrastructure as well as bio-renewable plant-based oil feedstock incorporated with fossil-based oil. LG Chem's eco-friendly plants can be operated with renewable energy such as hydropower and solar heat, and our bio-circular balanced products can be recycled through mechanical and chemical methods.



# Bio-Circular Balanced

LG Chem has succeeded in developing bio-balanced products based on renewable oil that is derived from sources such as vegetable oil. Using eco-friendly material is more beneficial to the Earth's environment as it dramatically reduces carbon emissions during the manufacturing process. LG Chem has acquired ISCC Plus certification, the world's most renowned authentication for eco-friendly bio products, for 58 bio-circular balanced products (as of July 2023). We plan to expand the scope of green products in the future.



#### What is ISCC Plus Certification?

ISCC Plus certification is an international certification that meets the Renewable Energy Directive of the European Union (EU) and verifies the traceability of sustainable raw materials used in eco-friendly bio products under strict standards.

# Bio-Based Materials



A wide variety of plastics can be synthesized using biomonomers (alcohol, acid, and amine) obtained by decomposing and fermenting starch derived from corn and sugarcane. Compared to conventionally manufactured plastics, synthetic plastics have a significantly reduced carbon footprint.



Bio-based materials are plastics made from plant-based raw materials. One of the biggest advantages of bio-based materials is the reduction of carbon dioxide emissions that occur naturally during the production process. LG Chem is researching the development of various bio-based plastics by utilizing biomonomers extracted from plant-based raw materials such as corn and sugarcane.



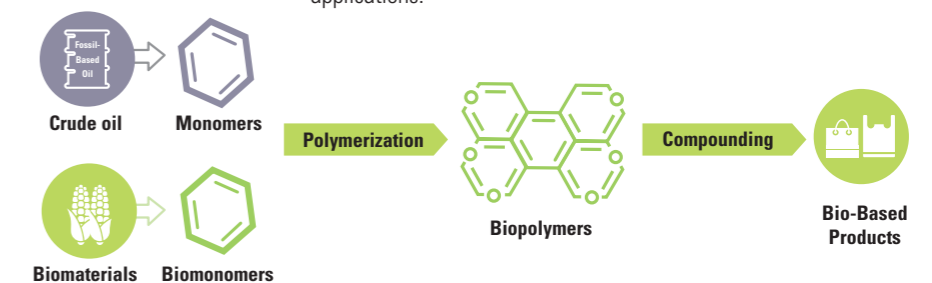
Automotive parts made from Bio-Based PA56 material

## Main Features

- We produce plastics using biomonomers derived from plant-based materials such as corn and sugarcane.
- The process of growing plants, which are the raw materials for bio-monomers, is highly effective in reducing carbon emissions and is more eco-friendly as it reduces the content of raw petroleum materials.
- Products made from bio-based materials can be recycled mechanically and chemically after use.

## Manufacturing Process

A variety of plastics can be synthesized using alcohol, acid, and amine compounds obtained by decomposing and fermenting starch extracted from corn and sugarcane. These synthesized plastics are further processed through methods such as compounding, which enhances their physical properties and enables a wide range of applications.



## Manufacturing Process

Bio-PA, PLA

Key Products from Bio-Based Materials



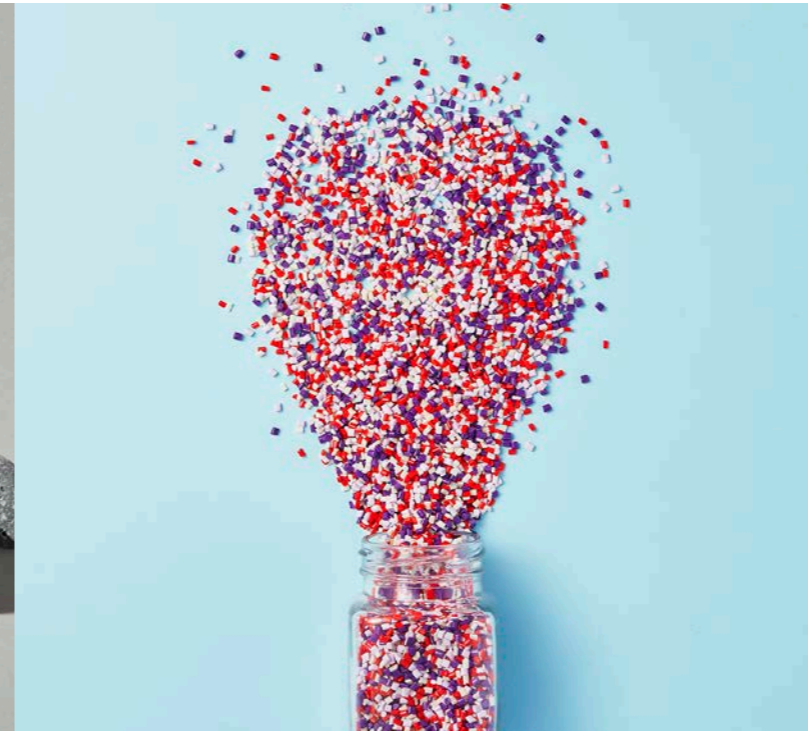
**Bio-balanced SAP**

Baby and adult diapers, feminine hygiene products, and pet pads



**Bio-balanced NPG**

Paint (powder coating, coil coating), PET films, coating agents, adhesives, UPR (Unsaturated Polyester Resin)



**Bio-balanced ABS**

Electrical/electronic devices, automobiles, construction materials, other miscellaneous goods



**Bio-balanced PE (HDPE, LDPE, EVA, POE)**

Injection molding, bottle caps, coating, films, foam products



**Bio-balanced IPA**

Cleaners for semiconductor/LCD manufacturing, paint, pharmaceuticals, and cosmetics



**Bio-balanced Acrylates**

Paint, adhesives, coating



**Bio-balanced PP**

Non-woven fabric, automobile interior and exterior materials, injection molding



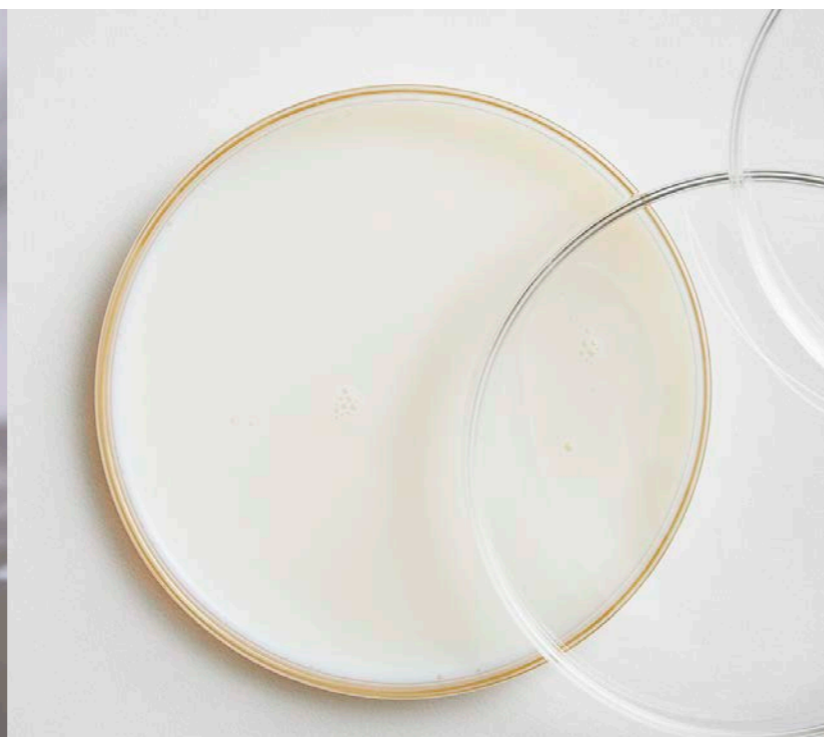
**Bio-balanced PVC**

Flooring, window profile, artificial leather



**Bio-balanced PC**

Electrical/electronic devices, automobiles, industrial materials, building materials



**Bio-balanced NBL**

Gloves



**Bio-balanced BR**

Tires, shoes



**Bio-PA**

Automotive, electrical and electronic (E&E) components, textiles



LG Chem's Eco-Friendly Materials Brand