

# LETZero

## Product Book

 RECYCLED  BIO



LETZero 



## LG Chem's Eco-friendly Material Brand - LETZero

LETZero, a portmanteau of 'Let' and 'Zero', embodies our commitment to achieving 'zero environmental harm and zero net carbon emissions'.

It serves as the master brand unifying LG Chem's eco-friendly materials: 'recycled materials' from reprocessed waste plastics, and 'bio-materials' derived from renewable plant-based resources.

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**LETZero  
BRAND**



LET & Zero

### Brand Name

LG Chem's eco-friendly material brand, LETZero, combines 'Let' and 'Zero' to signify its commitment to 'zero environmental harm and zero net carbon emissions'.

### Brand Design

The 'O' embodies LG Chem's commitment to a sustainable environment and future, visualizing a healthy, 'shared' future for all.

### 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 Products

LETZero is LG Chem's brand, driven by the commitment to reduce polluting carbon emissions and resolve ecological harm, thereby building a sustainable future where humanity and nature coexist on our planet. It broadly comprises two types: 'Recycled Materials' reprocessed from waste plastics, and 'Bio Materials' derived from renewable plant-based resources. Both are produced to minimize environmental impact.



## Recycled Materials

Materials produced by LG Chem's mechanical/chemical recycling of collected, sorted, and crushed waste plastics.

### Key Materials

#### Mechanical Recycling

PCR ABS, PCR PC & PC/ABS, PCR PE, PCR PP, PCR PVC, OBP

#### Chemical Recycling

Circular Balanced



## Bio Materials

Eco-friendly materials made from plant-derived bio-based raw materials, significantly cutting carbon emissions in production.

### Key Materials

#### Bio-Circular Balanced

SAP, NPG, IPA, Acrylates, ABS, PE, PP, PC, PC/ABS, PVC, NBL, BR, SSBR

# Recycled Materials



## Recycled Materials

Re-utilized through mechanical and chemical processes

LG Chem produces 'PCR (Post-Consumer Recycled)' materials from mechanically recycled waste plastics, and 'Circular Balanced' materials chemically returned to their original raw material state.

These two complementary methods minimize environmental harm via resource circulation, avoiding waste disposal like landfill and incineration.

Mechanical  
Recycling

Chemical  
Recycling



# Mechanical Recycling

PCR ABS   PCR PC & PC/ABS   PCR PE   PCR PP   PCR PVC   OBP



## Eco-Friendly Plastic, as good as new

PCR(Post-Consumer Recycled) refers to plastics made from items used and discarded by consumers. LG Chem mechanically reproduces virgin-like plastic materials by sorting and extracting plastics from discarded consumer electronics like TVs, computers, and refrigerators. LG Chem's PCR plastics are certified for their PCR content by eco-friendly bodies such as UL ECV, TUV, and GRS.



# PCR ABS

## Post-Consumer Recycled Acrylonitrile Butadiene Styrene

LG Chem has developed the industry's first White PCR ABS. Crafted from recycled ABS(Acrylonitrile Butadiene Styrene), it offers both bright, clean colors and high quality. Furthermore, LG Chem's PCR ABS maintains superior mechanical properties even after repeated use.

Conventional PCR ABS was predominantly produced in black-based colors due to the nature of mixed recycled ABS feedstock. This restricted its application in appearance-critical products such as white goods. In 2020, LG Chem globally pioneered the development and mass production of White PCR ABS, boasting physical properties equivalent to virgin ABS. Producing White PCR ABS necessitates the precise separation and sorting of light-colored raw materials even prior to the grinding stage. Furthermore, optimal white pigment selection and blending technology are paramount. LG Chem has standardized its recycled ABS sorting process and, through proprietary technology, mass-produces PCR ABS that not only achieves a perfect white color but also maintains quality levels comparable to virgin ABS.

### Key Features

- By recycling post-consumer home appliance plastics, it reduces plastic waste and mitigates particulate matter and greenhouse gas emissions through minimized incineration.
- Enables bright colors, including white, for versatile interior/ exterior applications, especially in white goods.
- Retains excellent mechanical properties post-extrusion, offering thermal stability and chemical resistance comparable to virgin grades.

### Manufacturing Process

Precise segregation of ABS from plastic waste during recycling is critical for PCR ABS production. Subsequently, LG Chem's proprietary additives are blended with the purified recycled feedstock to finalize the product.



### Application Scope

PCR ABS demand and applications are broadening beyond electronics and home appliances, extending to diverse sectors like automotive and construction. LG Chem continuously invests in R&D to meet evolving customer demands and facilitate wider adoption.

### Key Applications

Home appliances such as TVs, Multifunction Printers, and Air Purifiers.



PCR ABS Remote Control

# PCR PC & PC/ABS

Post-Consumer Recycled  
Polycarbonate



In 2009, LG Chem commercialized PCR PC and PCR PC/ABS, recycled engineering plastics derived from Polycarbonate(PC). A product containing 50% PCR PC/ABS offers an approximately 40% carbon footprint reduction compared to its virgin grade.

Polycarbonate is an engineering plastic capable of replacing metal and ceramic materials. It combines transparency with over 150 times the strength of tempered glass, maintaining stability even at temperatures exceeding 120°C. PCR plastics, recycled from post-consumer waste, enable low-energy product manufacturing. This significantly contributes to global environmental protection by reducing energy consumption, carbon emissions, and waste generation.

## Key Features

- Production includes PCR PC products with up to 90% recycled PC and PCR PC/ABS compounds with up to 80% recycled content.
- Despite high recycled content, it maintains excellent impact resistance, heat resistance, and transparency comparable to virgin grades.
- It boasts 150 times the strength of tempered glass and withstands temperatures exceeding 120°C. Its easy processability, versatile color expression, and superior durability also enable broad application in various product exteriors.

## Manufacturing Process

A proven process is essential for sorting and collecting only transparent PC from diverse plastic waste. Collected transparent PC waste is then ground and washed into high-quality pellets. These pellets are optimally compounded with virgin material to produce final PCR products.



## Application Scope

With excellent impact resistance, heat resistance, and processability, it's widely applied in electronics and automotive interior/exterior parts.

## Key Applications

Laptops, TVs, Multifunction Printers, Network Devices, IT Appliances, Adapters, Chargers, Industrial Goods, Automotive Interior/Exterior Materials, Building Exterior Materials



PCR PC TV Set-top Box



PCR PC/ABS Soban(Korean Traditional Furniture)

# PCR PE & PCR PP

## Post-Consumer Recycled Polyethylene & Polypropylene

LG Chem produces PCR PE and PCR PP, recycled materials of Polyethylene(PE) broadly used for films(food, industrial, agricultural) and household containers, and Polypropylene(PP) applied in diverse sectors from automotive to medical.



LG Chem has developed high-quality PCR PE and PCR PP by recycling PE and PP, widely used commodity plastics. Our PCR products achieve virgin-equivalent quality, ensuring full applicability to existing uses. With a diverse range of application-specific PCR products (e.g., film, injection molding), they offer broad utility for various customer applications.

### Key Features

- Utilizing post-consumer plastic waste as feedstock reduces plastic waste and contributes to global environmental protection.
- Reduced plastic incineration lowers particulate matter and greenhouse gas emissions.
- Despite high recycled content (50-80%), products achieve virgin-equivalent properties.

### Application Scope

Our application-optimized PCR PE and PP product lines are developed for broad use in diverse packaging, such as films, containers, and caps. We continually conduct R&D to expand their application range.

### Key Applications

- PCR PE** : Flexible Packaging, Stretch Wrap, Heavy-Duty Bags, Blow-Molded Containers, Injection Molded Products (e.g., pallets, crates)
- PCR PP** : Injection Molded Containers / Caps

### Manufacturing Process

PE and PP are widely used commodity plastics across diverse industries, such as household goods, logistics, and electronics. Proportionate to their extensive application, they also constitute the majority of plastic waste. Therefore, precise sorting and separation are crucial for effective PE and PP recycling. Following grinding and washing to remove impurities, LG Chem's proprietary additives are blended to complete high-quality final products.



PCR PP



PCR PE



# PCR PVC

## Post-Consumer Recycled Poly Vinyl Chloride

PVC is a versatile thermoplastic widely utilized across diverse sectors, from building materials to household goods. Since 2023, LG Chem has produced PCR PVC by employing a technology that separates and extracts PVC from challenging-to-recycle composite products, including waste wallpaper, tarpaulins, and artificial leather.

PVC recycling was limited to commodity products like pipes, sashes, flooring, and wires; most other daily-use PVC was landfilled or incinerated. To address this, LG Chem established a circular resource system to collect, sort, and regenerate products such as waste wallpaper, tarpaulins, and artificial leather, previously destined for landfill or incineration. Through collaboration with recycling partners, LG Chem regenerates these challenging-to-recycle PVC products, achieving quality comparable to virgin PVC for diverse applications.

### Key Features

- Waste wallpaper, tarpaulins, and artificial leather, previously destined for landfill or incineration, are utilized as feedstock.
- Reduces production-related carbon emissions by up to approximately 40% compared to virgin PVC.
- PCR PVC can be produced in powder and pellet forms, utilizing up to 100% recycled PVC.
- In collaboration with local authorities, LG Chem is piloting and expanding a PVC waste wallpaper recycling collection system.

### Manufacturing Process

Recycled raw materials are produced by precisely separating and extracting PVC from composite waste products via mechanical/physical methods. Subsequent quality enhancement processes, including impurity removal and compounding, yield final PCR products in pellet or powder form.



### Application Scope

LG Chem's high-purity PCR PVC enables virgin-equivalent new product production, establishing an inner-cycle (product-specific circular system). This allows for both the regeneration of existing products and broad application to diverse everyday items such as flooring and bags.

### Key Applications

Flooring, Tarpaulins, and Artificial Leather (e.g., automotive seats, sofas, bags, notebooks)



PCR PVC in pellet and powder forms



PCR PVC from Tarpaulin Bags

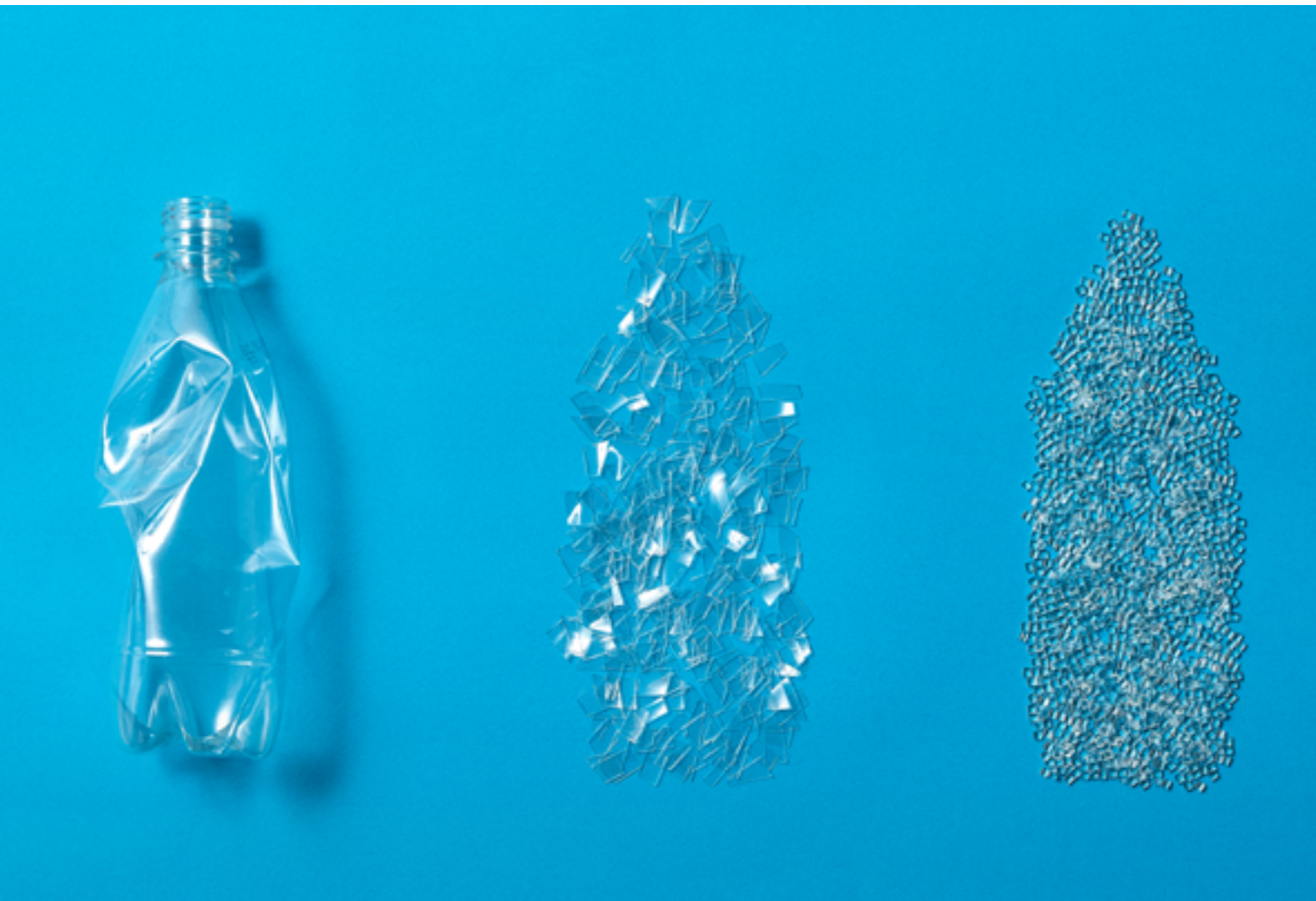
# OBP

## Ocean Bound Plastic

OBP(Ocean Bound Plastic) is defined as plastic waste at high risk of entering the ocean.

This waste, often abandoned near coastlines, can be carried into the sea by elements like rain, wind, tides, river flows, or floods.

LG Chem collects such OBP and transforms it into recycled plastic material.



OBP(Ocean Bound Plastic) refers to plastic waste discarded within 50km of coastlines. Recycling OBP proactively prevents plastic from entering the ocean and protects marine ecosystems. To conserve marine ecosystems, LG Chem collects various plastic waste, such as fishing nets and PET bottles, discarded within 50km of the coast, and transforms them into recycled plastic materials.

### Key Features

- Collecting and recycling ocean-bound plastic proactively prevents marine pollution and significantly contributes to marine ecosystem conservation.
- Recycling discarded fishing nets and PET bottles produces OBP PET and OBP PA materials.
- The entire supply chain is transparently verified by eco-certification bodies.

### Manufacturing Process

Fishing nets(PA) and PET bottles(PET) discarded within 50km of coastlines are collected and sorted by material and color. Impurities are then precisely removed through grinding and washing. Finally, LG Chem's proprietary additives are blended into the purified OBP feedstock to produce the final OBP material.



### Application Scope

The OBP material produced by LG Chem is compounded into various Engineering Plastics (EP) using proprietary technology. The resulting material finds widespread use in high-value components across diverse industrial sectors, including electronics interior/exterior parts and automotive components.

### Key Applications

- OBP PET: Furniture, electronic products, and automotive components
- OBP PA: Smartwatches, switches, and automotive components



OBP PET & PA pellets from ocean waste PET bottles, fishing nets



Circular Pyrolysis Oil' and 'Refined Pyrolysis Oil' from chemically recycled waste plastics



# Chemical Recycling



**Circular Balanced**

## Chemically Renewing Materials to Raw State

Even waste vinyl and composite plastics, which are challenging for mechanical recycling, can be chemically recycled into 'Circular Pyrolysis Oil'. This 'Circular Pyrolysis Oil' replaces fossil fuel-based feedstock in existing conventional processes, enabling the production of diverse plastic materials. LG Chem's 'Circular Balanced' materials, produced using 'Circular Pyrolysis Oil', deliver the same high quality as conventionally manufactured plastics and are eligible for ISCC Plus(Circular Economy) certification.

# Circular Balanced Materials

LG Chem employs chemical recycling to process low-grade and composite waste plastics, which were challenging for conventional mechanical recycling. This method restores waste plastics to their primary raw material state, enabling the production of recycled plastics that match the quality of virgin plastics.



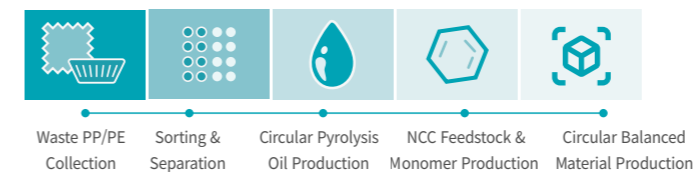
Chemical recycling is a method that decomposes waste plastics through chemical processes to recover them as basic raw materials or polymer forms. LG Chem utilizes supercritical pyrolysis technology to produce 'Circular Pyrolysis Oil' from waste plastics, which is then reintroduced into the process to create 'Circular Balanced' materials.

## Key Features

- Plastics produced via chemical recycling offer the same quality as virgin plastics, experiencing no quality degradation even after multiple recycling cycles.
- Through supercritical pyrolysis technology, composite PE and PP plastics, including previously challenging-to-recycle items like snack bags and plastic lids, can be transformed into 'Circular Pyrolysis Oil' capable of plastic reproduction.
- Feeding 'Circular Pyrolysis Oil', derived from chemical recycling, into the NCC enables the production of diverse 'Circular Balanced' materials.

## Manufacturing Process

Waste plastics are decomposed using 'supercritical pyrolysis,' which employs high-temperature and high-pressure supercritical steam. Items such as snack bags, plastic lids, and containers can be pyrolyzed and fed back into petrochemical processes. From an input of 10 tons of plastic waste, approximately 8 tons of 'Circular Pyrolysis Oil' can be extracted. The remaining about 2 tons of by-product gas is then reused as energy for factory operations.



LG Chem Dangjin Chemical Recycling Plant



# Bio Materials

## Reduce carbon emissions with renewable materials

LG Chem is building a diverse product portfolio for a sustainable future, utilizing renewable bio-feedstock alongside conventional fossil feedstock. Most of these Bio-Circular Balanced products are ISCC Plus certified, internationally verifying sustainable raw material use and ensuring product reliability and sustainability.



Bio  
Materials





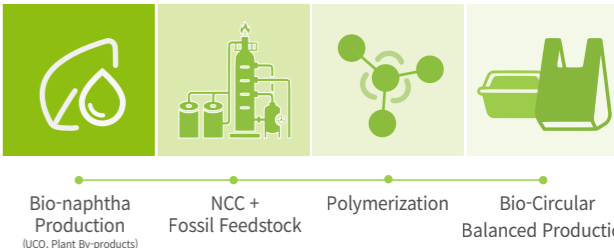
Through the Biomass Balance approach, LG Chem produces diverse eco-friendly products using renewable plant-based feedstock. This reduces fossil fuel consumption and lowers carbon emissions. Our Bio-Circular Balanced products are made by blending plant-based bio-renewable feedstock, such as Used Cooking Oil(UCO), with fossil-based feedstock. This process efficiently utilizes existing petrochemical infrastructure and guarantees properties identical to conventional plastics.

**Key Features**

- The use of bio-renewable feedstock with fossil feedstock drastically reduces carbon emissions during manufacturing.
- Established a stable feedstock supply process through a strategic partnership (MOU) with Neste, the world's largest bio-feedstock supplier.
- Achieved ISCC Plus certification, an international standard meeting the EU's strictest Renewable Energy Directive.

**Manufacturing Process**

Products are manufactured utilizing existing petrochemical infrastructure, by combining fossil-based feedstock with renewable plant-based bio-feedstock. These Bio-Circular Balanced products are fully recyclable, both mechanically and chemically.



# Bio-Circular Balanced

LG Chem has successfully developed Bio-Circular Balanced products, combining fossil feedstock with renewable plant-based bio-feedstock. This approach drastically cuts carbon emissions during manufacturing, significantly contributing to global environmental protection.

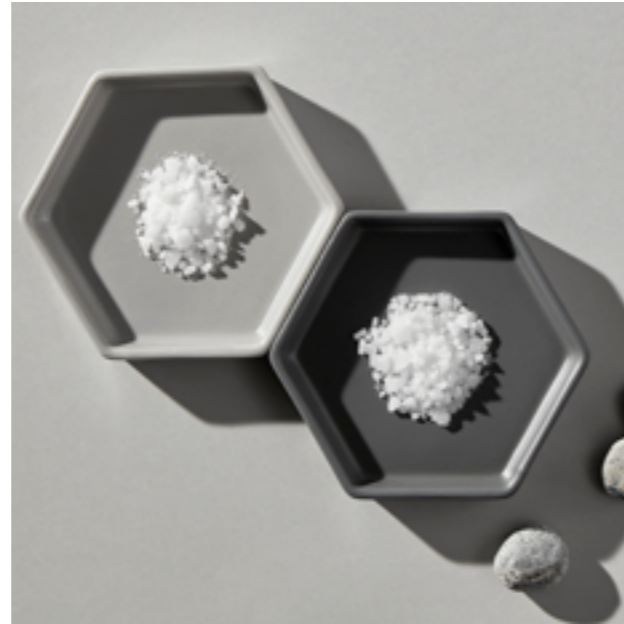


**What is ISCC Plus Certification?**  
 ISCC Plus is an international certification compliant with the EU's Renewable Energy Directive, rigorously verifying the end-to-end traceability of sustainable raw materials used in eco-friendly bio-products.

**Bio-Circular Balanced Product Highlights**



**Bio-Circular Balanced SAP**  
Baby/Adult Diapers, Sanitary Pads, Pet Pads



**Bio-Circular Balanced NPG**  
Paints (Powder, Coil), PET Film, Coatings, Adhesives, and UPR



**Bio-Circular Balanced ABS, ASA**  
Electronics, Automobiles, Building Materials, Sundries



**Bio-Circular Balanced HDPE**  
Injection, Blow, Bottle Caps



**Bio-Circular Balanced IPA**  
Semiconductor & LCD Cleaners, Paints, Pharma & Cosmetics.



**Bio-Circular Balanced Acrylates**  
Paints, Adhesives, and Coating Materials



**Bio-Circular Balanced LDPE**  
Injection Molding, Coating



**Bio-Circular Balanced PVC**  
Flooring, Window Frames, Synthetic Leather



**Bio-Circular Balanced PC, PC/ABS**

Electronics, Automobiles, Industrial Materials, Building Materials



**Bio-Circular Balanced NBL**

Hoses, Insulation, Auto Parts, Mats, O-rings, Gaskets



**Bio-Circular Balanced BR, SSBR**

Tires, Shoes



**Bio-Circular Balanced SBS**

Asphalt Additives, Compounds, Plastic Additives, Adhesives

**LETZero**  
LG Chem's Eco-friendly Material Brand



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For inquiries about the LETZero product book, please contact us at the following channels.

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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.

