COMPOSTABLE

RECYCLABLE

BIO-BASED

# futeon™

## PLA SOLUTIONS FOR A

# SUSTAINABLE PERFORMANCE

futerro

# ABOUT FUTERRO

## A LEGACY OF INNOVATION

Futerro is a pioneer in sustainable bioplastics, leading the development and production of Lactic Acid, Lactide and Poly-Lactic Acid (PLA), a compostable and bio-based plastic, since 1992. Officially launched in Belgium in 2007, **Futerro combines decades of research with industrial expertise** to deliver innovative, bio-based solutions that replace fossil-based plastics in everyday life.
With an annual capacity of 100,000 tons, Futerro operates one of the world's largest PLA production facilities.

## OUR MISSION: A GREENER TODAY FOR A BRIGHTER TOMORROW

Futerro encourages a **sustainable ecological transition and the defossilization** of the chemicals and materials sector, guiding the direction towards a more resilient and circular future.

More than
**270**
**PATENTS**

More than
**30**
**YEARS OF EXPERIENCE**

Current production of
**100**
**KILO TONNES PER YEAR**

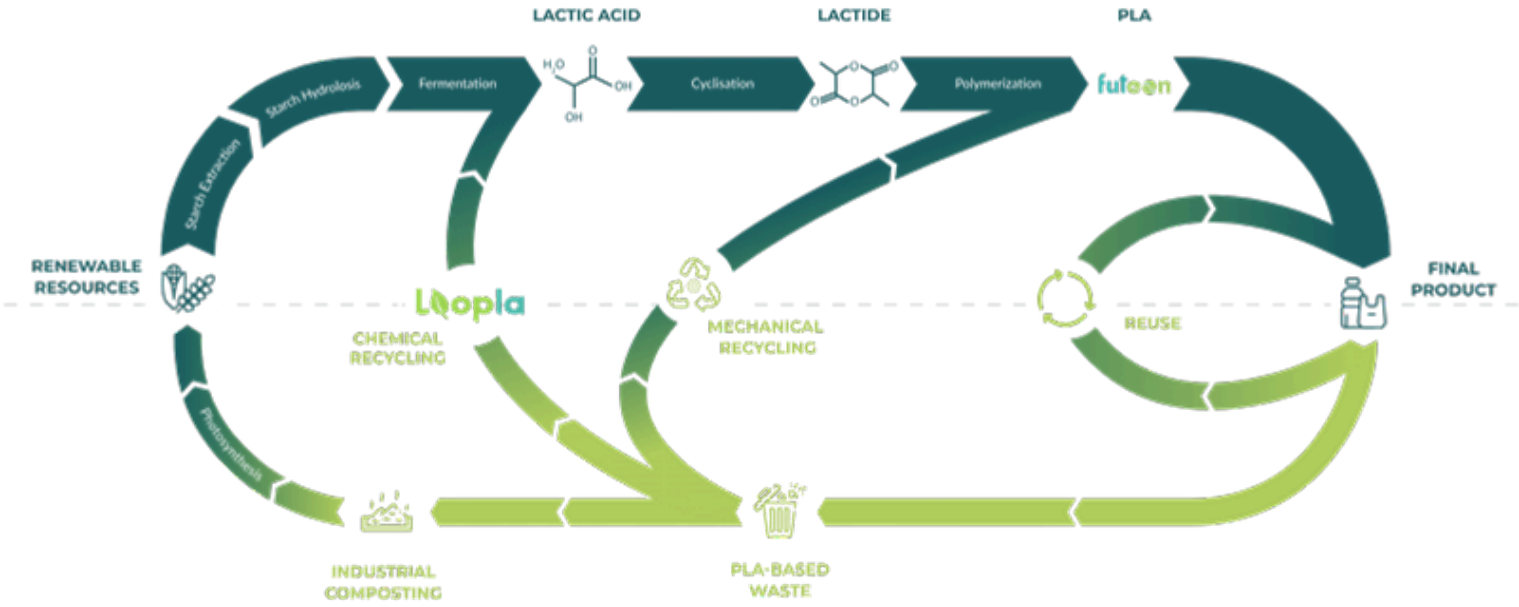
**6**
commercially available
**PLA GRADES**

# ABOUT FUTEON™ PLA


## FUTEON™: PLA SOLUTIONS FOR A SUSTAINABLE PERFORMANCE

**Futeon™ PLA, or polylactic acid**, is a biopolymer emerging from the **combined power of biotechnology and chemistry**. Derived from renewable resources such as sugar from corn or wheat, Futeon™ PLA is an alternative to traditional fossil-based plastics.

## FROM NATURAL RENEWABLE FEEDSTOCKS TO FUTEON™ PLA



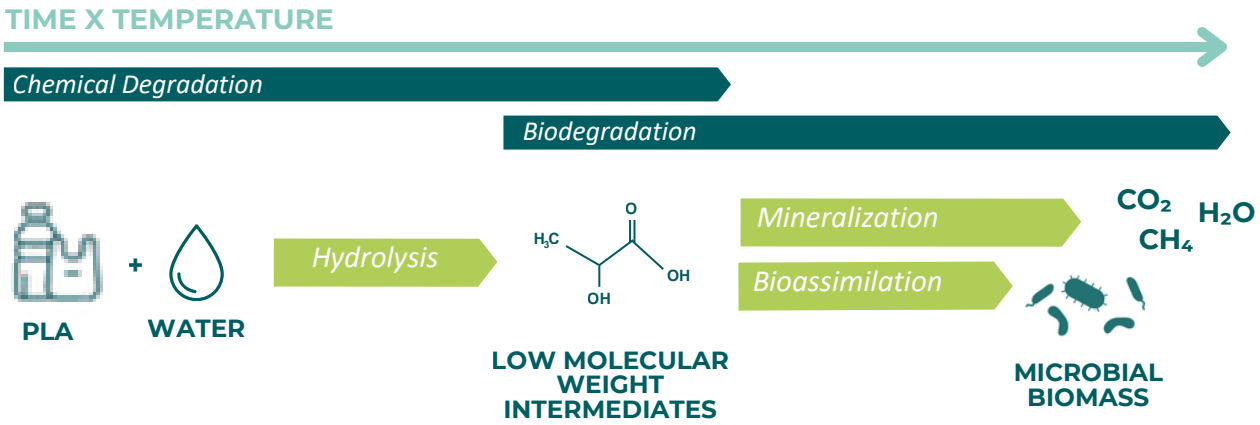
# ENVIRONMENTAL FOOTPRINT

## REDUCES CARBON FOOTPRINT

**Futeon™ has a ~75% lower carbon footprint compared to traditional fossil-based plastics**. Indeed, PLA is derived from renewable resources and therefore retains the carbon originally absorbed from the atmosphere by the biomass used in its production.

## FUTEON™ PLA DOES NOT RELEASE PERSISTENT MICRO- AND NANOPLASTICS INTO THE ENVIRONMENT

When moisture or water is present, **PLA will undergo complete biodegradation**, its molecular structure being vulnerable to chemical attack by water (hydrolysis), **without leaving any persistent plastic particles in the environment**[1].




[1] Holland Bioplastics, Hydra Marine Science. (2024). PLA does not create persistent microplastics in the environment

Mechanisms for PLA Degradation: In the presence of water, PLA undergoes hydrolysis as a pure chemical process of polymer degradation during which low molecular weight intermediates such as oligomers and lactic acid monomers are produced. These become soluble and can be biodegraded. Microbes take up these oligomers and monomers as food and use them to build up biomass and as energy for metabolism. Ultimately, this leads to mineralization of the original polymer carbon into carbon dioxide, methane, and water

# PROPERTIES

## BIO-BASED
**Futeon™** is 100% made from renewable raw materials.

## INDUSTRIALLY COMPOSTABLE
**Futeon™** is 100% biodegradable in industrial composters.

## RECYCLABLE
**Futeon™** is both mechanically and chemically recyclable thanks to several technologies such as **Loopla™**.

## BREATHABLE
**Futeon™** can be used in applications requiring high breathability such as fibers and nonwoven.

## DURABLE
**Futeon™** can be also used for long-lasting and demanding applications.

## SEALABLE
**Futeon™** is particularly suitable for the usual methods of producing a seal under optimal conditions.

## PRINTABLE
**Futeon™** is an ideal substrate on which to print.

## DIMENSIONALLY STABLE
**Futeon™** inherently displays low shrinkage and warpage.

## TRANSPARENCY
**Futeon™** can deliver outstanding transparency enhancing shelf appeal.

## GMO-FREE
**Futeon™** is made with natural and non-modified raw materials and bacteria.

## FOOD-CONTACT
**Futeon™** is approved for food contact in USA, Europe and China.

## CERTIFICATIONS

**ISO**
- ISO 9001
- ISO 14001

**Biobased**
- DIN EN 16785-1:2016-03
- ISO 16620-2:2000-12

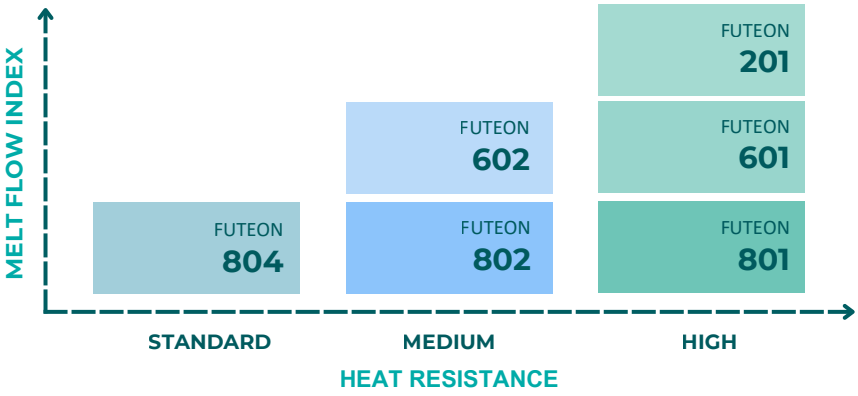
**Compostable**
- DIN EN 13432:2000-12

**Food Contact**
- USA, Europe and China

**REACH**
- Compliant

# FUTEON™ GRADES

The multiple **Futeon™** PLA grades which can be produced with our technology, are suitable for various conversion technologies: **Futeon™** pellets can be processed through conventional plastic processing techniques and may be used for many applications.




## TECHNICAL DATA

| TYPICAL VALUES | UNIT | 201 | 601 | 801 | 602 | 802 | 804 |
|---|---|---|---|---|---|---|---|
| DENSITY | g/cm³ | 1.24 | | | | | |
| STEREOCHEMICAL PURITY | %L-isomer | >99 | | | 98 | | 96 |
| MELT FLOW INDEX (MFI 190°C) | g/10 min | 30 | 10 | 4 | 10 | 4 | |
| APPEARANCE | | Crystalline white pellets | | | | | |
| RESIDUAL MOISTURE | Ppm | <400 | | | | | |
| MELTING TEMPERATURE (TM) | °C | 170-180 | | | 160-170 | | 150-160 |
| GLASS TRANSITION TEMPERATURE (TG) | °C | 55-60 | | | | | |
| TENSILE MODULUS | MPa | 3500 | | | | | |
| TENSILE STRENGHT | MPa | 50 | | | | | 45 |
| ELONGATION AT BREAK | % | <5 | | | | | |

| | FUTEON 201 | FUTEON 601 | FUTEON 801 | FUTEON 602 | FUTEON 802 | FUTEON 804 |
|---|---|---|---|---|---|---|
| THERMOFORMING | | | ✓ | | ✓ | ✓ |
| FIBERS & NON-WOVEN* | ✓ | ✓ | ✓ | ✓ | | ✓ |
| SHEETS, FILMS & COATINGS | | | ✓ | | ✓ | ✓ |
| INJECTION | ✓ | ✓ | | ✓ | | |
| 3D PRINTING | | | ✓ | ✓ | | ✓ |
| BLOW MOULDING | | | ✓ | | ✓ | ✓ |

** According to the process*

# APPLICATIONS

## 3D PRINTING

PLA is the **most common material** used for the **FDM** process (Fused Deposition Modelling). Its low printing temperature, ease of use, and excellent dimensional stability make it the **ideal filament** for a large range of printing applications, from prototyping to final product creation.

## AGRICULTURE & HORTICULTURE

Plastics have long supported modern agriculture by boosting yields, protecting crops, and improving efficiency. **Futeon™ meets the dual challenge of productivity and sustainability**: circular by design, soil-compostable when blended, and does not emit persistent microplastics in the environment.

## CONSUMER GOODS

From reusable containers, toys, personal care items, to electronics and lifestyle accessories: Futeon™ PLA is helping **redefine what sustainable consumer goods can be**. Futeon™ offers manufacturers a way to meet growing demand for eco-conscious products without compromising on quality, safety, or design.

# APPLICATIONS

## FOOD & BEVERAGE PACKAGING

For both rigid and flexible formats, Futeon™ offers a circular, **bio-based alternative** combining high transparency, strong mechanical performance, and excellent barrier properties.

## FOOD SERVICEWARE

From takeaway containers to cutlery, food serviceware plays a **central role in modern convenience**. Futeon™ PLA offers a smart alternative: a bio-based, **low-carbon** footprint material that delivers the **performance** food serviceware demands, while supporting **circularity** with different end-of-life options.

## FIBERS & NONWOVEN

As the textile and nonwoven industries seek to reduce their environmental footprint without compromising on performance, **Futeon™ brings together softness, strength, breathability, renewable origin, and circularity**. A perfect solution for manufacturers looking to innovate responsibly.

# TRANSFORMATION PROCESSES

**Futeon™ PLA is designed to support a wide range of transformation processes.**


## 3D PRINTING

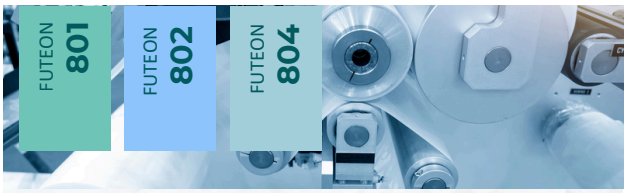
Dimensional Accuracy
Low Printing Temperature & Ease-of-use
Excellent Visual Quality
No Harmful Fumes


## BLOW MOULDING

Barrier Properties
Food-Contact Approved
Recyclable


## FIBERS & NON-WOVEN

Bacteriostatic
Breathability
Low Flammability
Soft & Safe

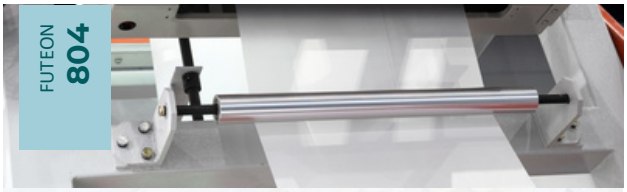



## FILM & SHEET EXTRUSION

Barrier Properties
Controlled Shrinkability
Transparency
High Gloss & Printable


## INJECTION MOULDING

Intrinsic Rigidity
Robust Mechanical Strength
Excellent Surface Finish & Transparency
Colorability & Printability




## PAPER COATING

Barrier Properties
Food-Contact Approved
Downgauging
High Gloss & Excellent Transparency

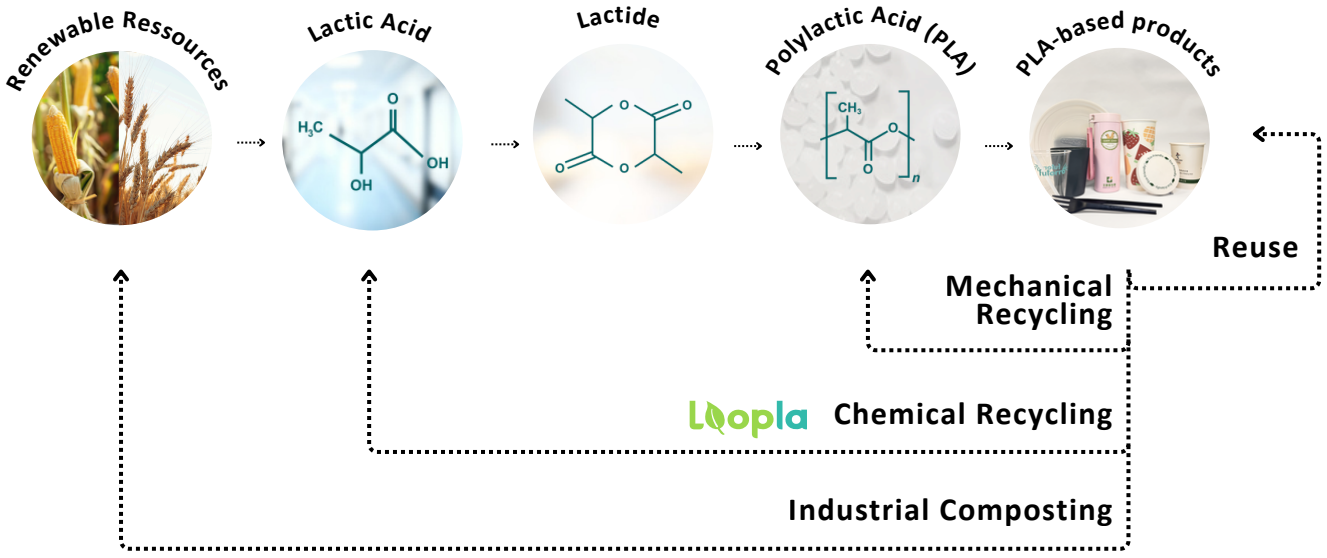

## THERMOFORMING

Barrier Properties & Food-Contact Approved
High Gloss & Excellent Transparency
Sealable
Printability

# FUTEON™ CIRCULARITY

## END-OF-LIFE MANAGEMENT

**Futeon™** is one of few plastics that are biobased, recyclable through various technologies, industrially compostable, and, depending on the application, reusable. These properties make **Futeon™** an excellent choice for promoting a full and virtuous circularity:



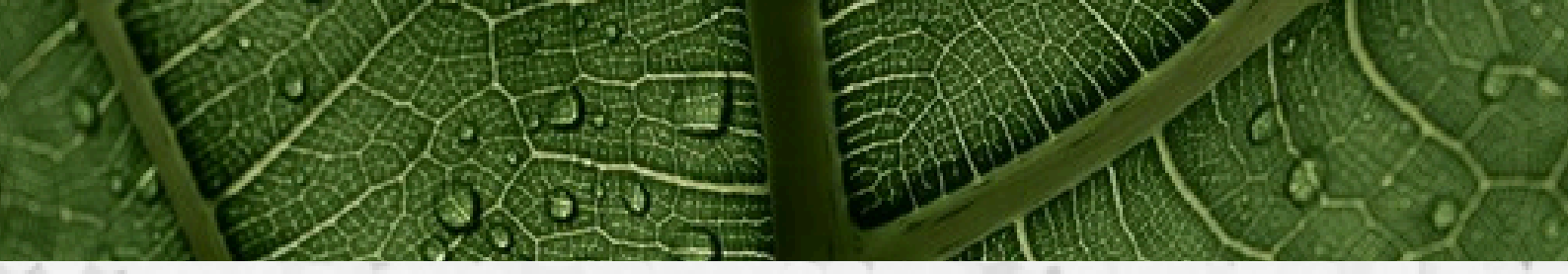

Loopla

## ADVANCING CIRCULARITY IN PLASTICS

In addition to producing **Futeon™**, Futerro provides a fully circular economy solution through its patented **chemical recycling technology: Loopla™**. This high-yield technology enables the conversion of PLA waste back into lactic acid, which is then used to produce chemically-recycled **Futeon™**, retaining exactly the same properties as the virgin one derived from biofeedstocks.

Futerro's objective is to participate in the environmental transition from petrochemicals to green chemistry. Knowing the impact of plastics on our ecosystems, developing the biopolymer market is a crucial step if we want to achieve carbon neutrality and leave fossil resources in the ground. With PLA, we are now offering a solution to meet these challenges.
By putting passion and integrity at the heart of our business, we aim to support our customers in their strategic change and value chain evolution towards a greener future.

**Frédéric Van Gansberghe**
**CEO and Founder of Futerro**



# STAY CONNECTED

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