



COMPOSTABLE
100%
BIOPLASTIC



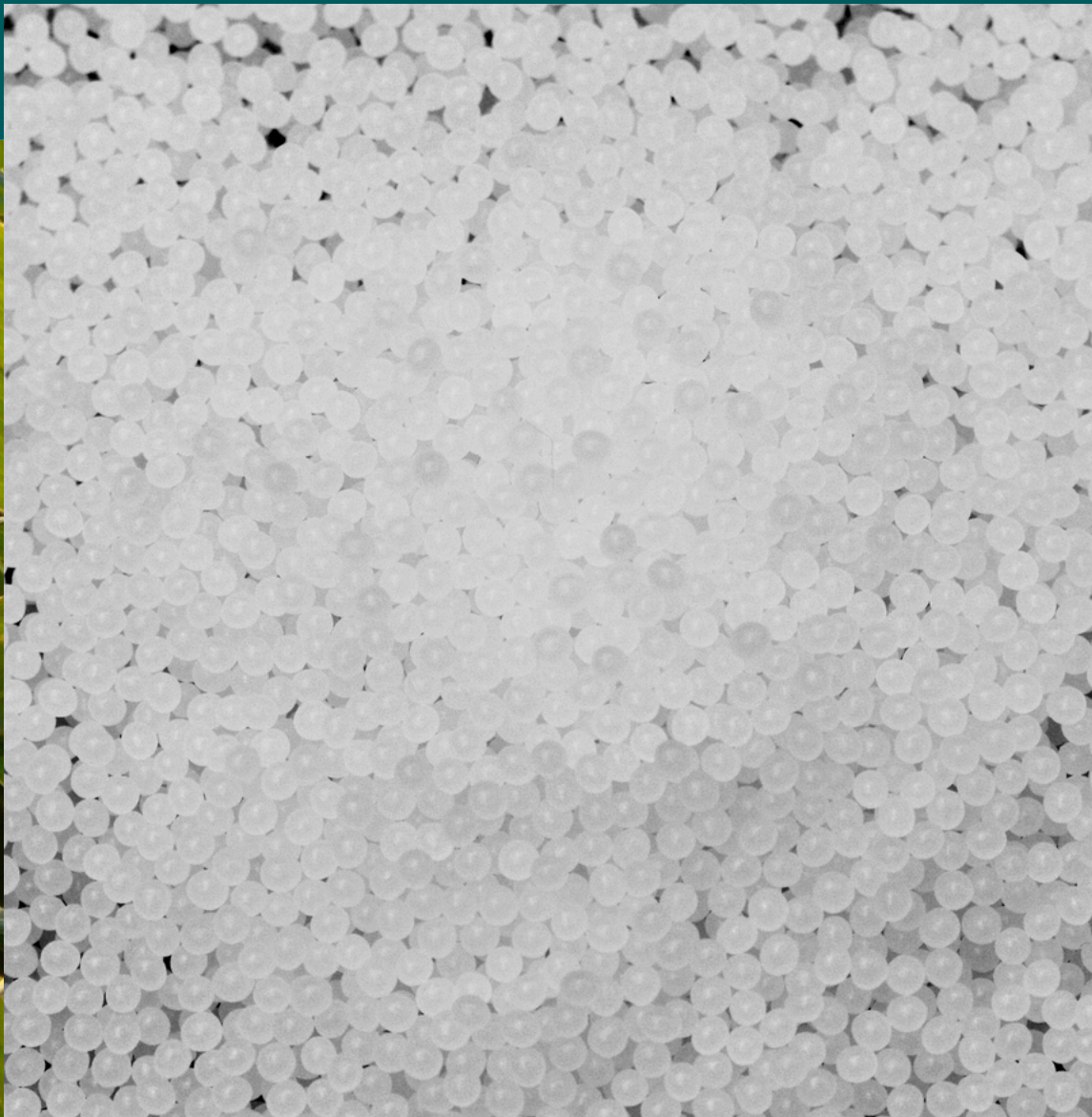
RECYCLABLE
100%
BIOPLASTIC



BIO-BASED
100%
BIOPLASTIC

futeon

THE BIORENEWABLE POLYMER **PORTFOLIO**



futerro



ABOUT FUTERRO

MORE THAN 30 YEARS OF EXPERIENCE

Futero is a well-established Belgian Company and was the first company working on the development of lactic acid, lactide and Poly-Lactic Acid (PLA) as early as 1992.

Futero has extensive industrial experience in lactic acid production on different substrates in USA, Europe, and Asia, and is continuously upgrading its processes to produce cheaper and better lactic acid and lactide with the final purpose of producing high-quality PLA (**Futeon™**).

Futero's first industrial PLA plant allows the production of a wide range of **Futeon™** for all existing applications with an annual capacity of 100 KT making us the second largest PLA producer in the world.

OUR PRODUCT: FUTEON™

Futeon™ is a bio-based material produced from renewable sources. It comes from greenhouse gases converted into fermentable sugars through plants. The sugar is then converted into lactic acid and finally into **Futeon™** by our technology based on non-GMO bacteria.

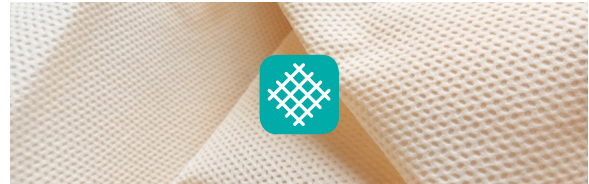


APPLICATIONS



THERMOFORMING

Futeon™ is suitable for thermoforming applications. These applications are varied and can produce for example food and beverage packagings.



FIBERS & NON-WOVEN

Futeon™ creates opportunities for fibers and non-woven materials allowing its applications in for example apparel, beauty and cleaning wipes, cosmetic cases, home textiles, etc.



INJECTIONS MOLDING

Futeon™ is suitable for injection molding applications usually performed for food-packaging, food serveware, medical applications, electronics and appliances.



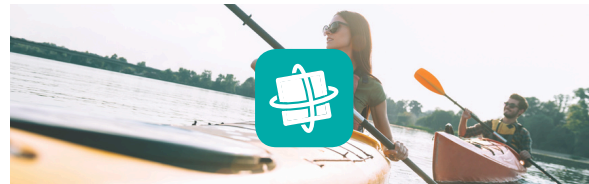
FILMS & COATING

For films and coating, **Futeon™** is fully allowed for food packaging, paper coating, weaving, and other industrial applications.



3D PRINTING

Filament made with **Futeon™** is suitable for 3D printing thanks to its versatility, easy printability and excellent combination of physical properties, both mechanical and thermal.



ROTOMOLDING

Futeon™ can be processed for rotomolding applications to produce e.g. traffic cones, canoes, and kayaks, pallets, garden planters, or complex medical products.



BLOW MOLDING

Futeon™ is designed for blow molding of PLA-based bottles. Processing lines used for standard PET bottles are suitable for those bioplastic solutions through some adjustments of process parameters.

PROPERTIES

BIO-BASED

Futeon™ is 100% made from renewable raw materials.

INDUSTRIALLY COMPOSTABLE

Futeon™ is 100% biodegradable in industrial composters.

RECYCLABLE

Futeon™ is 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

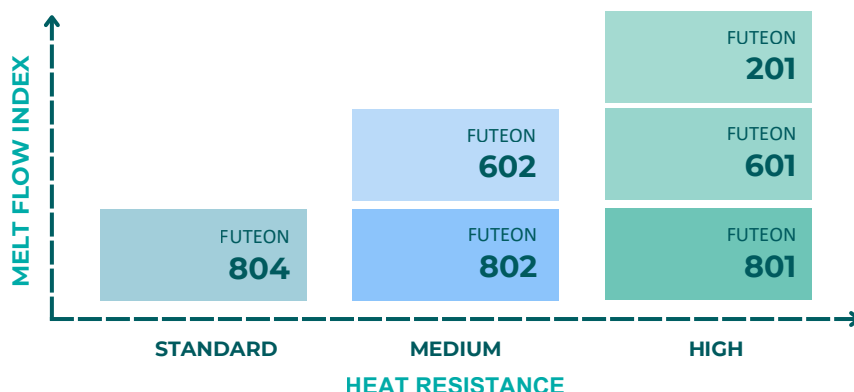
REACH

- 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.



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					

TECHNICAL DATA

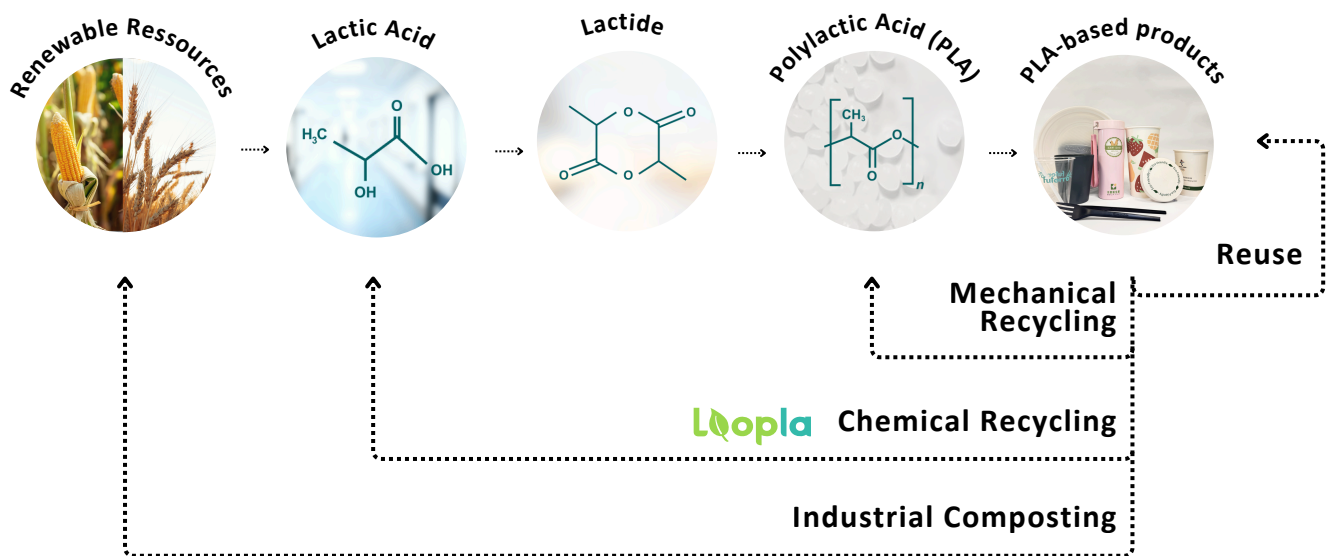
APPLICATIONS

	FUTEON 201	FUTEON 601	FUTEON 801	FUTEON 602	FUTEON 802	FUTEON 804
THERMOFORMING			✓		✓	✓
FIBERS & NON-WOVEN		✓		✓		✓
FILMS & COATINGS			✓		✓	✓
INJECTION	✓	✓		✓		
3D PRINTING			✓	✓		✓
EXTRUSION			✓		✓	✓

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:



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 ARRIVES IN FRANCE

Futerra's new biorefinery is set to produce **75,000 tons of PLA annually**, utilizing Futerra's patented technology. Situated on a 26.5-hectare site in Port-Jérôme II, Saint-Jean-De-Folleville, **Normandy, France**, the project involves a **500 million euro investment**.

It is expected to create **250 direct jobs and 900 indirect jobs** in the area. The PLA produced will be primarily aimed at the European market.

The construction of the biorefinery will cover the entire bio-based plastics production chain, from inception to recycling, and is set to be **fully operational by 2028**.

The biorefinery would include 3 main, distinct, and complementary units (ISBL):

- A **fermentation** unit in which sustainable wheat sugar would be transformed into lactic acid,
- A **polymerization** unit to transform lactic acid into lactide and PLA,
- A PLA **recycling** unit which, thanks to the patented **Loopla** technology, will allow production of virgin quality PLA by recycling post-industrial and post-consumer PLA waste.

Support facilities are also planned to ensure the smooth operation of the site (OSBL like wastewater treatment, storage, administrative offices...).



75 000

tonnes of PLA to be produced annually

250

direct jobs and up to 900 indirect jobs creation

26.5

hectares of surface area in Normandy

500

millions euro of investment



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 of Futerro



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